Inflation Expectations and Consumption Expenditure*

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Abstract

We document a positive cross-sectional association between households' inflation expectations and their willingness to purchase durable consumption goods. Households that expect inflation to increase are 8% more likely to have a positive spending attitude compared to households that expect constant or decreasing inflation. This positive association is higher for more educated households, working-age households, high-income households, and urban households. We use novel German survey data for the period from 2000 to 2013 to establish these facts. To obtain identification, we exploit an unexpected shock to households' inflation expectations: the newly-appointed administration unexpectedly announced in November 2005 a three percentage point increase in the value-added tax (VAT) effective in 2007. The unexpected VAT increase led to an exogenous increase in inflation expectations which had a large positive effect on the willingness to spend on durables. Our findings suggest that fiscal and monetary policy measures that engineer higher inflation expectations may be successful in stimulating consumption expenditures.

JEL classification: D12, D84, D91, E20, E21, E31, E32, E50, E52

Keywords: Inflation Expectations, Readiness to Spend, Zero Lower Bound, Fiscal Policy, Monetary Policy, Survey Data, Stabilization Policy, Adaptive Expectations

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I Introduction

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. Christina Romer (2013)

Can temporarily higher inflation expectations contribute to higher spending on consumption goods? This question has stirred a large debate during the Great Recession, with nominal interest rates constrained by the zero lower bound. Proponents of the thesis argue that temporarily higher inflation expectations may increase aggregate demand, stimulate GDP, and bring the economy back to its steady-state growth path. The positive relationship between inflation expectations and consumption spending should be higher for durable consumption, because households can easily substitute purchases of durable goods over time. Theoretically, this argument hinges on two premises. First, in times of fixed nominal interest rates, an increase in inflation expectations decreases real interest rates (Fisher equation). Second, lower real interest rates reduce savings and stimulate consumption (Euler equation).[1] However, the positive effect of lower real interest rates on consumption depends on assumptions regarding preference. In addition, households use paper money and short-term liquid savings instruments as a medium of exchange. Because inflation is an implicit tax on those assets, it may lower economic activity.[2] Higher inflation expectations may also lead to higher uncertainty, and hence in fact reduce consumption spending via a precautionary-savings channel.[3] Therefore, the sign of the association between households' inflation expectations and their willingness to spend on consumption goods is an empirical question.

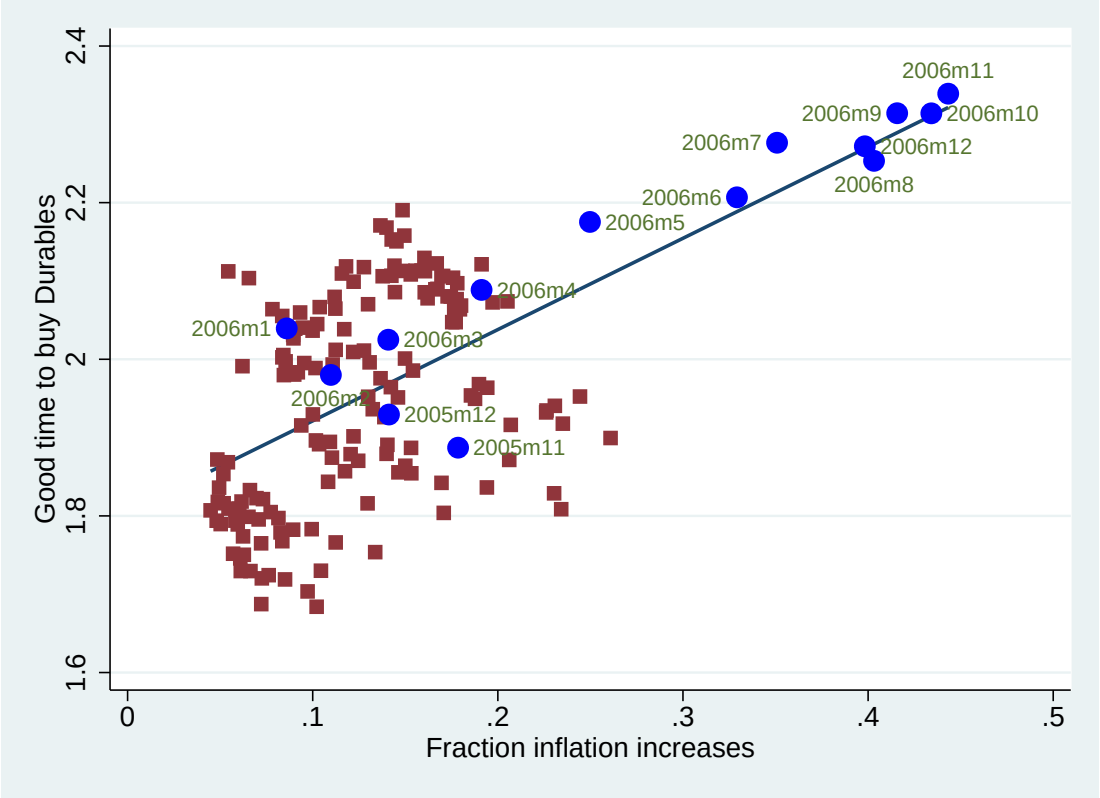
In this paper, we use novel micro data from a survey of German households from January 2000 until December 2013 to study the cross-sectional relationship between inflation expectations and households' reported readiness to spend on durable

[1] Higher inflation expectations may also boost consumption spending through a wealth-redistribution channel, if borrowers have higher marginal propensities to consume out of wealth (Doepke and Schneider (2006) and Mian, Rao, and Sufi (2013)). Rogoff (2011) supports temporary higher inflation to allow under-water households to delever, whereas Krugman (2013) favors higher inflation to increase aggregate demand.

[2] See Aruoba and Schorfheide (2011).

[3] See Taylor (2013), Bloom (2009), and Pástor and Veronesi (2013).

Figure 1: **Readiness to spend on durables and inflation expectations**



This figure plots the average monthly readiness to purchase durables on the y-axis against the average monthly inflation expectation. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households whether it is a good time to purchase durables given the current economic conditions. Higher values correspond to better times. GfK also asks how consumer prices will evolve in the next twelve months compared to the previous twelve months. We create a dummy variable that equals 1 when a household expects inflation to increase. The sample period is January 2000 to December 2013 for a total of fourteen years.

consumption goods.

Figure 1 shows our main finding. We present a scatter plot of the average monthly willingness to purchase durable goods across surveyed households, against the share of households that expect inflation to increase. The solid line is the slope of a regression of average willingness to purchase durables on the index of inflation expectations. The correlation between inflation expectations and spending attitudes is 0.59 over the full sample.

The blue circles show that inflation expectations and the average willingness to purchase durables increased during 2006. The newly-elected administration between the Christian Democrats and the Social Democrats unexpectedly announced in November 2005 a three-percentage-point increase in the value-added tax (VAT) effective in January

2007. This shock to inflation expectations helps causally link inflation expectations to the readiness to purchase durable consumption goods.

We employ novel survey data collected by the market research firm GfK on behalf of the European Union to measure consumer confidence in Germany. The survey asks households to pick one of three choices to answer the question on whether it is a good time for their household to purchase durable goods given general economic conditions ("it is neither a good nor a bad time," "it is a bad time," "it is a good time").

We estimate a set of multinomial logit regressions to study the relationship between inflation expectations and willingness to spend. The positive association in the scatter plot is a robust feature of the data. In our baseline specification, households that expect inflation to increase are on average 8% more likely to declare that it is a good time to buy durable goods for them, compared to households that expect constant or decreasing inflation. This positive association holds when we control for observed household-level heterogeneity with a rich set of demographic variables, as well as for macroeconomic conditions common to all households. Our results are similar if we interpret the three options as an ordered set of choices, and hence use an ordered probit model for estimation, or if we estimate the relationship using ordinary-least squares.[4]

To assess the extent to which the association between households' inflation expectations and their reported willingness to purchase durable goods may be causal, we exploit a sudden shock to households' inflation expectations, which is peculiar to the German setting. The newly-formed German government unexpectedly announced in November 2005 a three-percentage-point increase in the VAT effective January 2007. The VAT increase was legislated to consolidate the federal budget. Indeed, we observe a surge in inflation expectations throughout 2006. The European Central Bank (ECB) is responsible for monetary policy in the whole Euro area, including Germany, and its mandate is to guarantee price stability for all Euro-membership countries. The ECB did not increase nominal rates to offset the increase in inflation expectations in Germany.[5] The marginal effect of inflation expectations on the propensity to purchase durable goods more than doubles to 19% during this period. When we exclude the period from November 2005 to December 2006 from the sample, we find a highly statistically significant marginal

[4]See Table A.5 in the online appendix.

[5]In the words of the president of the Bundesbank at the time (Weber (2006)): "We know what the effects of the VAT increase are; as is the case for oil prices, we do not consider one-off effects."

effect of 5.5% over the whole sample and for each year separately.

We then move on to study heterogeneity in the inflation expectations – willingness to spend nexus across demographics. The association is stronger for survey participants with a college degree, for urban households, for larger households, and for high-income households. The size of the association is similar across age groups, but it drops by 20% for survey participants in retirement age.

Using cross-sectional micro data to study the relationship between inflation expectations and willingness to spend has several advantages compared to using aggregate time-series data. First, micro data allow us to study the relationship between inflation expectations and readiness to buy durables at the level of the actual decision maker. Second, the granularity of the data allows us to control for factors that may induce a negative relationship between inflation expectations and the purchases of consumption goods, and to study the impact of household heterogeneity. Third, the cross-sectional nature of the data allows us to study the inflation expectations – willingness to spend nexus across different time periods. Finally, aggregate inflation expectations and consumption expenditure are jointly determined. Household buying intentions, instead, are unlikely to affect aggregate prices, which mitigates reverse-causality concerns.

Two features of the novel German data make them ideal for studying the relationship between households' inflation expectations and their willingness to purchase durable goods. First, the survey explicitly asks households about *their* willingness to spend on consumption goods, as opposed to their opinion on whether it is generally a good time to consume *for people* as in the Michigan Survey of Consumer (MSC), which has been used to study similar questions in the United States. Second, the German setting allows us to exploit the unexpected announcement of an increase in VAT in 2005. This shock is close to the ideal experiment of exogenously increasing households' inflation expectations in times of constant nominal interest rates, and helps us to identify causally the effect of inflation expectations on households' willingness to spend on durable goods. Indeed, the rise in average inflation expectations during 2006 was accompanied by an increase in the average willingness to purchase durable goods and followed by a spike in actual inflation during 2007 (see Figure 2 to Figure 4).

Our analysis is also subject to a set of shortcomings. First, our survey consists of repeated cross sections of households. We cannot exploit within-household variation

in inflation expectations to control for time-invariant unobserved heterogeneity at the household level. The rich set of household demographics, household expectations regarding their personal economic outlook (such as their future employment status and financial conditions), as well as expectations regarding macroeconomic aggregates (such as GDP and unemployment), help alleviate this concern. Moreover, the unexpected increase in inflation expectations during 2006 further helps us causally interpret the effect of higher inflation expectations on households' willingness to spend on durable consumption goods. Second, the survey only elicits a measure of households' readiness to purchase consumption goods, and we do not observe the actual consumption behavior of households ex post. Previous research has shown that households' willingness to spend on durables closely tracks actual consumption expenditure on durable consumption goods.[6] A third potential shortcoming of our analysis is that the survey only elicits qualitative inflation expectations. However, the results of Binder (2015) on the bunching of households' inflation expectations at salient threshold values in quantitative surveys suggest that the qualitative nature of our measure could be an advantage.

To fix ideas, consider the following example of two households A and B. Household A has a perception of average inflation of 2%. Household B has a perception of average inflation of 6%. Household A expects that inflation will increase, and therefore thinks it is a good time to purchase durables. Household B expects inflation to decrease, and therefore wants to postpone the purchase of durable goods. Assume further that household A reports in a quantitative survey that it expects inflation during the next twelve months to be 3%, whereas household B replies 5%. If we were to run a cross-sectional regression of the reported willingness to purchase durable goods on the quantitative inflation expectations, we would find a negative coefficient even though the true underlying relation between inflation expectations and willingness to purchase durable goods is positive.

Our paper provides empirical support for a large and growing theoretical literature that emphasizes the stabilization role of inflation expectations. On the monetary policy side, Krugman (1998), Eggertsson and Woodford (2003), Eggertsson (2006), and Werning (2012) argue that a central bank can stimulate current spending by committing to higher future inflation rates during periods in which the zero lower bound on nominal interest rates binds. On the fiscal policy side, Eggertsson (2011), Christiano, Eichenbaum, and

[6]See Bachmann, Berg, and Sims (2015) for evidence in the US and Figure 7.

Rebelo (2011), and Woodford (2011) show that inflation expectations can increase fiscal multipliers in standard New Keynesian models in times of a binding zero lower bound on nominal interest rates. From a historical perspective, Romer and Romer (2013) argue that deflation expectations induced by the monetary authority caused the Great Depression, whereas Eggertsson (2008) suggests that a fiscal and monetary policy mix was successful at engineering higher inflation expectations and spurring the recovery from the Great Depression. From an international perspective, Hausman and Wieland (2014) study the monetary easing of the Bank of Japan together with the expansionary fiscal policy commonly known as "Abenomics." They provide evidence consistent with higher inflation expectations raising consumption and GDP using aggregate time series data.

We also contribute to a recent literature that uses micro-level data to study the relationship between inflation expectations and households' readiness to purchase consumption goods. Bachmann et al. (2015) start this literature using survey data from the MSC. They find an economically small and statistically insignificant association between households' inflation expectations and their readiness to spend on durable consumption goods. Burke and Ozdagli (2014) confirm these findings using panel survey data from the New York Fed/ RAND-American Life Panel household expectations survey for a period from April 2009 to November 2012. Ichiue and Nishiguchi (2015) find that Japanese households that expect higher inflation plan to decrease their future consumption spending, but have increased their spending in the past. Other papers that use micro survey data from the MSC are Souleles (2004), who studies the rationality of consumer expectations; Piazzesi and Schneider (2009), who study momentum trading in housing markets; Malmendier and Nagel (2009), who show that personal experiences determine inflation expectations; Dräger and Lamla (2013), who study the anchoring of inflation expectations; and Carvalho and Nechio (2014), who document that a set of households form expectations consistent with a Taylor rule. Coibion and Gorodnichenko (2012) study the effect of macroeconomic shocks on forecast errors in the MSC and provide evidence consistent with models of informational rigidities. Informational ridigities might be at the core of our heterogeneous findings across demographic groups.

Our findings on the delayed adjustment in households' inflation expectation after the announcement of the VAT increase throughout 2006 in Figure 1 provide empirical support for deviations from a full-information rational attention benchmark (see Coibion

and Gorodnichenko (2012)), and can be used to test theories such as limited attention, bounded rationality, or rational inattention in macroeconomics.[7]

We also relate to Cashin and Unayama (2015), who exploit the VAT increase in Japan to estimate the intertemporal elasticity of substitution using micro data from the Japanese Family Income and Expenditure Survey. They do not observe households' inflation expectations.

Finally, the heterogeneity of our findings across demographic groups such as age, income, education, and city-size groups, relate our paper to the literature on economic and financial literacy (see, e.g., Campbell (2006) and Lusardi and Mitchell (2011) for recent overviews of the literature).

Increasing the transparency of monetary policy and facilitating the understanding of policy targets by the public are two key aims of the recent monetary policy strategy in the United States. The heterogeneity of our findings across demographic groups, as well as the delayed response in households' inflation expectations to the announced increased in the VAT, suggest that some households might not fully understand the aims of policy changes and interventions. Households' cognitive abilities and inattention to policy changes could also rationalize the differences between our findings and the existing literature. In the MSC, 3% of households expect a deflation of up to 50%, whereas 17% of households expect inflation to increase by more than 9% per year. Households might have a bad understanding of the concept of inflation, which is consistent with recent work by Binder (2015). 48% of households report inflation-expectation magnitudes as multiples of 5, which Binder (2015) interprets as uncertainty about inflation. Controlling for inflation uncertainty, she indeed finds a positive marginal effect of inflation expectations on the readiness to purchase durables for households that report a desire to buy in advance of rising prices. For households with ex-post accurate inflation expectations, which have most likely less uncertainty about inflation, Bachmann et al. (2015) also find a positive association between inflation expectations and readiness to purchase durable goods, consistent with the results of Binder (2015).

[7]See e.g., Sims (2010), Woodford (2012), Mackowiak and Wiederholt (2014), and Gabaix (2014).

II Inflation Expectations and Consumption Expenditure: Theory

Proponents of temporary higher inflation expectations typically argue that higher inflation expectations lead to lower real interest rates (Fisher equation effect). Lower real interest rates stimulate consumption expenditure via intertemporal substitution (Euler equation effect). The substitution effect should be especially strong for durable consumption goods, because they are the most interest-rate sensitive, and the easiest to substitute intertemporally. In this section, we sketch a simple model economy to emphasize the key assumptions necessary for this logic to hold.

The representative household derives flow utility from nondurable consumption, C_t, and the stock of durable consumption, D_t. The stock of durable consumption depreciates at a rate θ, and the representative household discounts future utility by a factor β. Both θ and β lie between 0 and 1. Households receive a nominal endowment each period of Y_t and enter the period with bond holdings B_t. Bonds earn a nominal gross return of R_t. P_t denotes the price index in period t, which for ease of exposition applies to both durable and nondurable consumption goods. The utility function is additively separable, and households derive flow utility, which is proportional to the stock of durables with a factor of proportionality of 1. Households have CRRA preferences with the same coefficients of relative risk aversion for nondurable consumption and the flow of durable consumption. We abstract from uncertainty. The representative household maximizes

$$\beta^s \sum_{s=0}^{\infty} \left(\frac{C_{t+s}^{1-\gamma}}{1-\gamma} + \frac{D_{t+s}^{1-\gamma}}{1-\gamma} \right)$$

$$\text{s.t.} \qquad P_t C_t + P_t \left[D_t - (1-\theta) D_{t-1} \right] + B_{t+1} = Y_t + R_t B_t.$$

The flow budget constraint states that nominal consumption expenditure for nondurable goods, investments in the stock of durable consumption goods, and bond purchases have to equal the nominal endowment and the payoff from previous-period bond purchases.

Let λ denote the Lagrange multiplier on the household's budget constraint. The first-order conditions for the representative household with respect to nondurable consumption,

durable consumption, and bond holdings are given by:

$$C_t^{-\gamma} = \lambda_t P_t \tag{1}$$

$$D_t^{-\gamma} = \lambda_t P_t - \beta \lambda_{t+1} P_{t+1}(1-\theta) \tag{2}$$

$$\lambda_t = \beta \lambda_{t+1} R_{t+1}. \tag{3}$$

Combining the first-order condition for nondurable consumption (equation (1)) with the law of motion for the Lagrange multiplier (equation (3)), we get the familiar intertemporal Euler equation for nondurable consumption goods:

$$\left(\frac{C_{t+1}}{C_t}\right)^{\gamma} = \beta \frac{R_{t+1}}{\pi_{t+1}}, \tag{4}$$

where π_{t+1} denotes price inflation between period t and $t+1$.

Combining all three first-order conditions, we get the intratemporal Euler equation for the choice between durable and nondurable consumption goods:

$$\left(\frac{C_t}{D_t}\right)^{\gamma} = \left[1 - \frac{\pi_{t+1}}{R_{t+1}}(1-\theta)\right]. \tag{5}$$

We see from equation (4) that higher inflation leads to a drop in consumption growth given fixed nominal interest rates, R_{t+1}, and $\gamma > 0$. We see from equation (5) that under fixed nominal interest rates, $\gamma > 0$, and $\theta < 1$, we also expect an intratemporal substitution from nondurable consumption to durable consumption. We can gain intuition for the intratemporal substitution from equation (2). One unit of the durable consumption good will depreciate to $(1-\theta)$ units in period $t+1$. We will therefore take the future discounted marginal utility of the undepreciated stock of durables into account when we equate the marginal utility of purchasing one more unit of the durable good and its marginal cost. Future marginal utility of one unit of the durable good purchased today increases in the future price level.

Several assumptions are necessary for higher inflation expectations to stimulate consumption expenditure. First, the Fisher equation is only an accounting identity, and does not say anything about equilibrium relationships and adjustments. We have assumed nominal interest rates do not immediately and fully increase to offset increasing inflation expectations. This assumption holds when the economy is constrained by the

zero-lower bound on nominal interest rates, in a currency union, or in the case of a small open economy. Second, we have assumed the shock to inflation expectations only affects current-period marginal utility, and have treated marginal utility of future consumption as given. This assumption implies that shocks to inflation expectations are sufficiently short-lived. Third, we have assumed that changes in inflation do not affect future nominal endowments. In this setup, higher inflation expectations increase the price of future consumption, and the substitution effect increases current-period consumption. Higher inflation leads to a drop in the present discounted value of real endowment, and hence both current and future consumption will decrease. Stickiness of wages can partially justify this assumption. If inflation increases future nominal endowments, then increases in inflation expectations, given fixed nominal interest rates, have similar implications as lower nominal interest rates. An income effect might work against the substitution effect. Empirically, the substitution effect seems to dominate (see Christiano et al. (2005)). Fourth, we abstracted away from uncertainty. Increases in inflation might lead to increases in uncertainty about fundamentals, and therefore lower consumption via a precautionary-savings channel. Fifth, households might be heterogeneous in their asset positions, their marginal propensities to consume, and have heterogeneous expectations regarding future endowments (see Auclert (2014)). We will therefore allow for differences in expectations regarding future real income in the empirical analysis.

The relationship between inflation expectations and consumption expenditure is theoretically ambiguous and ultimately an empirical question.

III Data

A. Data Sources

We use the confidential micro data underlying the GfK Consumer Climate MAXX survey. GfK conducts the survey on a monthly basis on behalf of the Directorate General for Economic and Financial Affairs of the European Union to measure consumer confidence in Germany. The goal of the survey is to provide household-level information for comparing business cycles across European Union member countries. In Germany, GfK asks a representative sample of 2,000 households questions about general economic expectations, income expectations, and willingness to buy consumption goods. The aim is to build a

synthetic measure of the monthly consumer climate in Germany. The survey consists of repeated cross sections of households. The company verifies the representativeness of the sample on a regular basis. GfK is Germany's largest market research institute, and it operates across most European countries, being the fourth-largest market research institute in the world. We obtained access to the confidential household-level data for the period starting in January 2000 and ending in December 2013, for a total of fourteen years. This period includes substantial time-series variation in macroeconomic fundamentals, two major recessions, and an unexpected increase in the German VAT in 2007. This shock is crucial to help us assess the extent to which the association between inflation expectations and willingness to spend on consumption goods is causal.

We use the answers to the following two questions in the survey to construct the main variables in our baseline analysis:

Question 8 *Given the current economic situation, do you think it's a good time for your households to buy larger items such as furniture, electronic items, etc.?*

Households can answer, "It's neither a good nor a bad time," "No, it's a bad time," or "Yes, it's a good time."

Question 3 *How will consumer prices evolve during the next twelve months compared to the previous twelve months?*

Households can answer, "Prices will increase more," "Prices will increase by the same," "Prices will increase less," "Prices will stay the same," or "Prices will decrease."

To get a measure of inflation increases, we create a dummy variable that equals 1 when households answer, "Prices will increase more." Households' inflation expectations are highly correlated with their perception of past inflation (see Jonung (1981)). Hence, we will also use survey question 2 in our baseline analysis to disentangle the effects of inflation expectations from inflation perceptions:

Question 2 *What is your perception on how consumer prices evolved during the last twelve months?*

Households can answer, "Prices increased substantially," "Prices increased somewhat," "Prices increased slightly," "Prices remained about the same," or "Prices decreased."

The online appendix contains the original survey and a translation to English.

We also use additional questions regarding expectations on general economic variables, expectations regarding personal income or unemployment, and a rich set of socio-demographics from the GfK survey. For robustness tests, we also assembled data for macroeconomic aggregates, such as official GDP and unemployment numbers from the German statistical office (DeStatis), nominal interest rates, the value of the German stock index DAX, and measures of European and German policy uncertainty from Baker, Bloom, and Davis (2014). The online appendix describes in detail the data sources and variable definitions.

B. Descriptive Statistics

Table 1 contains some basic descriptive statistics. 20% of households report that it is a good time to buy durables. 24% report that it is a bad time to purchase durables. More than 50% are indifferent, and think that it is neither a good nor a bad time to buy durables. 14% of households expect inflation to increase in the next twelve months. More than 80% of respondents think that prices in the previous twelve months increased substantially, somewhat, or slightly, with equal proportions for each answer. Only 13% think that prices remained the same, and essentially nobody reports that prices decreased.

The sample is balanced between women and men. The majority of respondents have a high school degree but no college education.[8] The mean household's size is 2.5, the majority of households live in cities with less than 50,000 inhabitants, and roughly 75% of households have a monthly net income of less than EUR 1,500.

Panel C reports statistics for households' personal expectations. Most households report that their financial situation has not changed in the last twelve months, and they expect the same for their future financial situation. Most households either do not save at all or only a little, and expect a constant or slightly increasing unemployment rate.

Panel D reports statistics for macroeconomic aggregates. The inflation rate averaged around 1.6% per year, and the average unemployment rate was slightly below 8%. The average level of the DAX stock index was 5,840 points, with an average annual volatility of 22.79%. Industrial production growth averaged around 1.6% per year, and the average oil price was $63.

[8]The majority of respondents went to either Hauptschule or Realschule, and only 8% of households have a college degree.

Figure 2 plots the monthly time series of the dummy variable for inflation increases averaged across households. Figure 3 plots the monthly time series of the average household's willingness to buy durable goods. Higher values correspond to higher spending propensities. Expected inflation increases hover around the time-series mean at the beginning of the sample, and then spike mid-2001, before dropping below mean levels until the end of 2005. 2006 contains a sharp increase in expected inflation, with a subsequent drop and two minor spikes in mid-2007 and 2008. The series fluctuates around its mean value for the rest of the sample. The propensity to purchase durables starts at the average level before dropping below the mean in 2001. The series increases slightly before increasing more sharply in 2006. The increase reverts in 2007 before the series starts trending upward at the end of 2008.

The top-left panel of Figure 4 plots the time series of the harmonized German CPI inflation rate in percent at an annual rate. The inflation rate is around 1.5% at the beginning of the sample and increases to 2.8% in May 2001 before it drops to 0.6% in May 2003. Then, inflation fluctuates between 1% and 2% until the end of 2006. At the beginning of 2007, the annualized inflation rate is 1.7%, and increases to 3.2% as of November 2007. Inflation remains high and above its sample mean until October 2008, before we see short periods of negative inflation in July and September 2009. After 2009, inflation slowly increases, and is above 1% in March 2010.

Inflation expectations in the GfK survey lead actual inflation, especially during the period between the announcement of the exogenous VAT increase in November 2005 and the effectiveness of the tax increase in January 2007. We discuss the relation between inflation expectations and actual inflation, willingness to purchase durables and actual purchases, and related issues in more detail in Section VI.

IV Inflation Expectations and Consumption Expenditure: Econometric Model

Our outcome variable of interest, households' readiness to purchase durable goods, derives from the discrete choices in the survey questions. The survey does not elicit a continuous measure of the readiness to spend, and an ordinary least-square specification would bias our estimates. Hence, we model the response probabilities in a multinomial logit model.

We assume the answer to the readiness to spend question is a random variable representing the underlying population. The random variable may take three values, $y \in \{0, 1, 2\}$. 0 denotes that it is neither a good nor a bad time to purchase durable goods; 1 denotes that it is a bad time to purchase durable goods, and 2 denotes that it is a good time to purchase durable goods.

We define the response probabilities as $P(y = t|X)$, where $t = 0, 1, 2$, and X is a $N \times K$ vector where N is the number of survey participants. The first element of X is a unit vector, and the other $K - 1$ columns represent a rich set of household-level observables, including demographics and expectations. The set of observables X allows us to control for heterogeneity across households, and hence reduces concerns that unobserved heterogeneity correlated with inflation expectations may drive any results.

We assume the distribution of the response probabilities is

$$P(y = t|X) = \frac{e^{X\beta_t}}{1 + \sum_{z=1,2} e^{X\beta_z}}, \tag{6}$$

for $t = 1, 2$ and β_t is a $K \times 1$ vector of coefficients. The response probability for the case $y = 0$ is determined, because the three probabilities must sum to unity

$$P(y = 0|X) = \frac{1}{1 + \sum_{z=1,2} e^{X\beta_z}}. \tag{7}$$

Equations (6) and (7) summarize our multinomial logit model. We estimate the model via maximum likelihood to obtain the vector β_t of coefficients for $t = 1, 2$, and set the category $y = 0$ as the baseline response. The β_t coefficients allow us to estimate the relative odds of an outcome for a change in the covariate of interest with respect to the base outcome.

For ease of interpretation, we compute the marginal effects of changes in the covariates on the probability that households choose any of three answers in the survey.

We exploit the fact that the response probability for $t = 0, 1, 2$ to a change in covariate x $\in$ X is given by

$$P(y = t|x) = \frac{e^{x'\beta_{tx}}}{\sum_{z=0,1,2} e^{x'\beta_{zx}}}. \tag{8}$$

For the case of approximately continuous covariates, we can compute the marginal

effect of each covariate x on the response probability as the derivative of $P(y = t|x)$ with respect to x

$$\frac{\partial P(y = t|x)}{\partial x} = P(y = t|x) \left[\beta_{tx} - \sum_{z=0,1,2} P(y = z|x)\beta_{zx} \right], \tag{9}$$

for $z = 0, 1, 2$. For discrete covariates, we determine the marginal effects by predicting the response probabilities for the potential values of the covariates, and compute the average across predicted probabilities. In all tables, we report the estimated marginal effects in Equation 9 for each covariate of interest.

V Inflation Expectations and Consumption Expenditure: Empirical Analysis

A. Baseline Analysis

Table 2 reports the average marginal effects for our baseline multinomial logit regression. We cluster standard errors at the quarter level, which results in 56 clusters. In the first two columns, the inflation increase dummy is the only explanatory variable. Column (1) reports the marginal effect of the inflation increase dummy on the likelihood that households respond, "it's a bad time to buy durables," whereas column (2) reports the marginal effect on the likelihood that households reply, "it's a good time to buy durables." We see that both marginal effects are positive and statistically significant. Economically, the marginal effect in column (2) implies that households that expect inflation to increase over the next twelve months are on average 6.2% more likely to answer, "it's a good time to buy durables" compared to households that expect constant or decreasing inflation. Surprisingly, households with higher inflation expectations are also more likely to have a more negative propensity to consume durables compared to households that expect constant or decreasing inflation. This result disappears once we control for expectations about the households' future economic conditions. We interpret this finding below.

The perception of past inflation shapes households' expectation of future inflation (see Jonung (1981) and Driver and Windram (2007)). Household heterogeneity in the perception of past inflation might partially drive the surprising positive marginal

effect of inflation increases on the likelihood of answering, "it's a bad time to buy durables." We indeed find in columns (3) and (4) that past inflation perceptions lower the marginal effect of inflation increases on the negative consumption propensity. Inflation perceptions increase the marginal effect for the likelihood that households have a positive attitude toward buying durables. High perceptions of past inflation decrease the marginal propensity to consume durables, whereas they increase consumers' negative attitude toward buying durables.

Increases in inflation expectations might increase uncertainty about the future, and lead to higher savings via a precautionary-savings channel. Past inflation perceptions negatively affect marginal propensities to consume, which hints towards the importance of anchoring inflation expectations. Higher inflation expectations might raise consumption spending today, but might lower consumption spending next year. The average marginal effects of past inflation perceptions in columns (3) and (4) are consistent with this interpretation.

B. Demographics, Idiosyncratic Expectations, and Macroeconomic Aggregates

We derive the theoretical relationship between inflation expectations and consumption expenditures in Section II. This relationship holds at the household level and, under suitable assumptions, also at the aggregate level (see, e.g., Attanasio and Weber (1993)). Households differ, however, in their purchasing propensity. Household characteristics determining purchasing propensities and households' inflation expectations might be systematically related. Hence, it is important to keep those characteristics constant in order to identify an effect of inflation expectations on spending attitudes.

Attanasio and Weber (1993) study the relationship between real interest rates and consumption growth and find "excess sensitivity" of consumption growth to labor income in aggregate data. They argue that young households might be borrowing-constrained and, therefore, adjust consumption to changes in labor income. Excess sensitivity disappears once they control for a rich set of demographics such as family size, education, and employment in cohort data. They justify their empirical model theoretically by means of cohort-specific taste shocks.

Households' economic outlook can also affect the relationship between inflation

expectations and their willingness to purchase durable goods. Imagine households systematically differ in their degree of optimism and pessimism about life in general. Households of type A have a positive outlook and expect good times ahead. Type-A households might therefore expect low inflation but high growth, and hence answer that it is a good time to buy durables. Households of type B might expect high inflation and low growth, and hence answer that it is a bad time to purchase durables. If we ran a cross-sectional regression of spending attitudes on inflation expectations without controlling for the type of household, we would estimate a negative coefficient.

Some households might be "bullish" about the economy in general and have some form of Phillips curve in mind when forming expectations. Those types of households might expect high GDP growth, which then causes high inflation.

Table 3 adds a rich set of demographics (columns (1) and (2)), expectations about personal and macroeconomic variables (columns (3) and (4)), and contemporaneous macroeconomic variables (columns (5) and (6)). Adding demographics has little impact on the statistical significance and economic magnitude of the effect of inflation increases on the willingness to purchase durables (columns (1) and (2)). Controlling for households' expectations regarding their own prospects or future macroeconomic variables increases the marginal effect of the inflation increase dummy on the "good time" outcome. Instead, adding the controls changes the sign of marginal effect on the "bad time" outcome. Economically, households that expect inflation to increase are on average 8.9% more likely to have positive spending attitudes compared to households that expect constant or decreasing inflation. Perceptions of high past inflation lower the propensity to purchase durables, which is consistent with an intertemporal substitution channel. Adding contemporaneous macroeconomic variables in columns (5) and (6) does not affect these findings.

Households' expectations appear important for the inflation-expectations–willingness-to-buy nexus. Table 4 studies the effect of those expectations on this nexus in more detail. Columns (1) to (4) split the sample of respondents based on their GDP growth outlook for the next year, using the median answer as cutoff. Columns (5) to (8) split the sample based on households' expectations regarding aggregate unemployment

during the following twelve months.[9] Columns (1), (2), (5), and (6) run the baseline multinomial logit specification only on households with a positive economic outlook, whereas columns (3), (4), (7), and (8) run the baseline analysis only on households with a negative economic outlook. Households that expect inflation to increase are 6%-8% more likely to be positively tempered toward buying durables compared to households that expect constant or decreasing inflation (even columns). Interestingly, the positive marginal effect of inflation expectations on replying, "it's a bad time to buy durables" is solely driven by those households that have a negative economic outlook for the following year (columns (3) and (7) vs. columns (1) and (5)). The differential effect of inflation expectations on households' willingness to purchase by household expectations hints at the importance of heterogeneity for macroeconomics. The effect of past inflation perceptions is again consistent with the intertemporal substitution channel.

C. Exogenous Shock to Inflation Expectations

The richness of the GfK micro data has many desirable features. We, however, cannot rule out that demand shocks result in movements along the supply curve, and hence in a positive relation between *realized* aggregate consumption and prices. Because we study the relationship between *expected* inflation and willingness to purchase durable consumption goods at the household level, it is unclear how demand shocks might affect inflation expectations and the propensity to consume. Ideally, we would want to exploit an exogenous shock to inflation expectations that does not affect households' willingness to purchase durable goods through channels different from inflation expectations. We attempt to get as close as possible to such an ideal shock following the narrative approach of Romer and Romer (2010).

The newly-formed German government unexpectedly announced in November 2005 a three-percentage-point increase in the VAT effective January 2007. The narrative records show that the VAT increase was not legislated for reasons related to economic conditions, but to consolidate the federal budget.[10] We discuss the narrative record and the historical

[9] The discrete nature of the survey with five possible answers results in unbalanced samples when we use the median answer as the cutoff. Results are virtually identical when we assign households with median expectations to the sample with a positive economic outlook (see Table A.2).

[10] A VAT increase in a fixed-nominal-rates environment resembles the unconventional fiscal policies to stimulate spending described in Correia, Farhi, Nicolini, and Teles (2013).

context in detail in Section VI.

Households may perceive that it is a favorable time to purchase durable goods for several reasons, including low prices, expected price increases, low nominal interest rates, generally good economic times, or prosperous times for the household. If increases in inflation expectations, and hence higher prices, are indeed the main mechanism through which households increase their consumption expenditures, we should see a stronger effect of inflation expectations on households' willingness to buy durables in 2006. The motive to purchase durable goods because of higher future prices and lower real interest rates is likely to be more important and salient in a period when VAT will increase compared to other reasons. We therefore expect to find a larger marginal effect of inflation expectations on purchasing propensities in 2006.

This argument requires that nominal interest rates do not increase sufficiently to leave real rates constant. Germany is part of the Euro currency area, and the ECB is responsible for monetary policy and price stability in the whole currency union. The ECB did not see the need to tighten monetary policy to accommodate the increase in inflation expectations in Germany. The use of cross-sectional variation further alleviates this concern. Assume two types of households. Households of type A expect inflation to increase, while households of type B expect inflation to decrease. All households face the same nominal interest rate. Type-A households, however, perceive lower real interest rates than type-B households. We should therefore see in the cross section that households of type A are more willing to purchase durable goods than type-B households even in times of rising nominal interest rates.

Figure 1 shows that inflation expectations and the average propensity to purchase durables are especially high in 2006. Table 5 studies this relationship using micro data to control for household characteristics and expectations. During the period November 2005 to December 2006, households that expect inflation to increase are 19% more likely to have a positive spending attitude, which is more than double the baseline marginal effect. Expected increases in inflation decrease the likelihood of replying, "it's a bad time to buy durables" by 6% compared to constant or decreasing inflation expectations. Our baseline findings continue to hold when we exclude the period November 2005 to December 2006 (see columns (3) and (4)). We do not find different marginal effects when we study the time period of the European financial debt crisis in columns (5) and (6).

Figure 5 shows that the increase in the marginal effect is contained to the period between November 2005 and December 2006, which alleviates concerns that aggregate demand shocks, or other unobservables, might drive our results.

The temporal buildup of inflation expectations during 2006 (see Figure 1) indicates that some households may be inattentive to policy announcements, as they only adjusted their expectations after the media covered the consequences of the VAT increase in greater detail.[11] This finding leaves scope for increased policy transparency and the fostering of financial and economic literacy to help households understand the implications of monetary and fiscal policies on inflation, consumption, and savings. Indeed, policy makers seem to be aware of these challenges.[12]

D. Household Heterogeneity

Both theoretically and empirically, household heterogeneity seems to matter for the inflation-expectation–consumer-spending nexus. We study the effect of different household demographics on this relationship.

Germany has a three-tier school system. Students typically have to decide after four years of primary school which track to choose. Hauptschule offers 9 years of basic education, Realschule offers 10, whereas Gymnasium typically finishes after 13 years with A levels, which is the required degree to enter university. Table 6 studies the relationship between inflation expectations and the willingness to spend on durables separately for households with different levels of education. When their highest level of education is a Hauptschule degree, households that expect inflation to increase are 6.9% more likely to have a positive stance toward buying durables compared to households that expect constant or decreasing inflation (column (2)). This marginal effect increases with education, and is more than 60% larger for households that hold a college degree (columns (4), (6), (8)). When they expect higher inflation, households with college degrees are 3.9% less likely to reply that it is a bad time to buy durables (column (7)). This negative marginal effect decreases in absolute value with lower education and is actually slightly positive - though not statistically significant - for the least-educated (columns (5), (3),

[11] See Menz and Poppitz (2013) for media coverage of inflation in Germany media during this time period.

[12] Bernanke (2010): Improving the public's understanding of the central bank's policy strategy reduces economic and financial uncertainty and helps households and firms make more-informed decisions.

(1)). The positive effect of education on the inflation-expectations–readiness-to-spend nexus suggests that policies aimed at engineering higher inflation expectations to stimulate consumption might have redistributive effects. Policy makers might consider educating households about their aims and targets to guarantee that households will behave according to the policy aims when setting their consumption and savings decisions.

Malmendier and Nagel (2009) show that personal inflation experiences shape inflation expectations. Age, city size, marital status, and household size might affect personal consumption, and hence inflation experiences. These demographics might also affect the nexus of inflation expectations and willingness to spend on durables through other channels such as financial and economic literacy (see Lusardi and Mitchell (2011) and references therein). The effect of inflation increases on willingness to buy durables is constant across age groups except for those aged 65 and older. Retirees have different time-use and consumption patterns compared to the working-age population, and might differ in their inflation experiences (see Aguiar and Hurst (2005)). Retirees typically also have nominal pensions in Germany, hold few real assets, and have lower human capital compared to someone in the labor force. Households of age 14 to 65 that expect inflation to increase are 9% more likely to buy durables compared to households that expect inflation to stay constant or decrease (Table 7, columns (2), (4), (6), (8)). This marginal effect is about 20% lower for households in retirement age (column (10)). Table 8 shows that households living in rural areas have a lower average marginal effect of inflation increases on their propensity to spend compared to households living in large cities. Households that expect inflation to increase and that live in cities with less than 2,000 inhabitants have a 5.8% higher likelihood of answering, "it's a good time to buy durables" (column (2)). This marginal effect increases to 8.5% for households in cities with up to 100,000 inhabitants (columns (4) and (6)), and is more than 10% for households living in cities with more than 100,000 inhabitants. Table 9 shows that larger households display a slightly higher marginal effect of inflation increases on spending attitudes compared to smaller households. Moving from decreasing or flat inflation expectations to increasing inflation expectations increases the likelihood that households consider the time favorable to buy durables by 10% for households of size 4 or 5 (columns (8) and (10)). This marginal effect is less than 9% for households of size 1 to 3 (columns (2), (4), (6)). We do not find any significant differences in the nexus of inflation expectations and willingness to spend

on durables for male versus female or households with or without children (Table 10). We find similar marginal effects for single, couple, and married households (Table 11), which is in the order of magnitude of our baseline findings (around 8.5%). Divorced survey participants show a slightly lower marginal effect (7.8%). Renters have a slightly higher marginal effect than house- or apartment-owners (Table 12). The full-time employed have a higher marginal effect than the part-time employed and unemployed (Table 13). In Table 14, richer households with a monthly net income above EUR 2,500 possess a 15% to 20% higher marginal effect of inflation increases on the likelihood to reply, "it's a good time to buy durables" (column (6)) compared to households with less than EUR 2,500 monthly net income (columns (2) and (4)).

Table 15 studies the effects of financial constraints. Some households might think it is a good time to purchase durables in times of high inflation, but they might be hand-to-mouth consumers and might not be able to substitute consumption intertemporally (see Campbell and Mankiw (1989)). The effect of hand-to-mouth consumers might be less strong in our setup as we only study the reported willingness to purchase durables rather than actual spending. Contrained households might be unable to substitute purchases intertemporally, but might still answer that it is a good time to purchase. Following the logic of Zeldes (1989), we split the sample in households which report that they currently save or save a lot, and households which report that they dis-save or take on debt. Table 15 shows that the marginal effect of higher inflation expectations is about 40% larger for households which are unconstrained compared to hand-to-mouth consumers.

The online appendix reports additional results and robustness checks. Results are quantitatively and statistically similar when we split the sample based on expectations regarding households' own financial situation, instead of the expectations regarding GDP and aggregate unemployment; when we estimate models with dummy-variable specifications for past inflation perceptions and expected inflation; when we estimate a linear probability or an ordered probit model; when we add month and year fixed effects; and when we exclude past inflation perception from the set of covariates. We also show that households that expect inflation to increase are on average more likely to say that it is a bad time to save compared to households that expect constant or decreasing inflation. GfK also asks households on a quarterly basis whether they want to spend more, the same amount, or less in the next twelve months compared to the previous twelve months

for various categories of consumption. We find that households which expect inflation to increase want to spend more on cars, furniture, appliances, and renovations to their house.

VI Discussion

In section V, we document that households with higher inflation expectations are more willing to purchase durable goods. The answer to the question we posed at the beginning of the paper might, therefore, be an affirmative yes: temporarily higher inflation expectations could indeed stimulate current consumption spending. There are, however, a few important points to discuss before we can infer any policy recommendations from our analysis.

Willingness to spend versus actual spending: We are ultimately interested in how inflation expectations transmit to the *actual* consumption behavior of households. Our survey does not ask for actual consumption behavior, but only reports the willingness to purchase durable goods. Figure 7 shows that the index of aggregate reported readiness to purchase durable goods based on the answers of our representative sample, and realized real durable consumption growth at the quarterly frequency in Germany, track each other closely.[13] Figure 8 is a scatter plot of the cyclical components of log real durable consumption and the aggregate index. We use a Hodrick-Prescott filter with smoothing parameter λ of 1,600 to extract the cyclical component. Again, the two variables are positively related with a correlation of 0.46. The reported willingness to purchase has potential advantages compared to measures of actual expenditures elicited with surveys. Actual spending data in surveys typically contains noise, because survey participants might not recall their actual purchases, or they might overstate their purchases of visible products such as cars and understate the consumption of "sin" products, such as tobacco and alcohol (see Hurd and Rohwedder (2012) and Atkinson and Micklewright (1983)). In addition, households' true willingness to purchase durable goods because of rising prices might not result in actual purchases if households have recently bought a car, refrigerator, etc. Looking at actual household spending might therefore introduce noise. Studying the

[13] We use the end-of-quarter value of the aggregate index to construct a quarterly series. We get similar results if we plot the average within a quarter or use the first or second monthly observation within a quarter.

reaction of the willingness to spend to higher inflation expectations, however, neglects potential adjustment costs to the stock of durables, and it might make us overestimate the actual effect. These concerns are alleviated by the fact that the reported willingness to purchase and actual purchases track each other closely.

Durable consumption versus aggregate demand: Academics and policy makers typically advocate temporarily higher inflation expectations during a liquidity trap to stimulate aggregate demand. The ultimate aim is to bring the economy back to its long-run steady-state growth path. We document that households with higher inflation expectations are more willing to purchase durable goods, but we do not observe whether households cut back on other components of consumption. In addition, higher inflation might be associated with higher inflation uncertainty (see Ball (1992)), which may bring firms to lower investment. Evidence for aggregate real GDP growth (Figure 9) suggests that higher inflation expectations might have indeed increased aggregate demand, because real GDP growth increased from 1.6% in the last quarter of 2005 to 4.38% in the last quarter of 2006.

Temporary versus permanent increases in inflation expectations: We focus our discussion on temporary increases of inflation expectations to stimulate aggregate demand. Some economists have suggested *unexpectedly* increasing inflation to "inflate away" government debt and delever household balance sheets. Blanchard, Dell'Ariccia, and Mauro (2010) and Ball (2013), on the contrary, recommend permanently higher inflation *targets* to lower the probability of hitting the zero-lower bound on nominal interest rates. Our evidence does not speak to the positive or negative effects of permanently higher inflation targets, whether expected or unexpected, on welfare. Hilscher, Raviv, and Reis (2014) suggest that unexpected higher inflation is unlikely to significantly lower real debt. Mishkin (2011) argues that the occurrence of zero lower bound periods is too rare to justify the cost of higher inflation. Findings by Gorodnichenko and Weber (2013), Weber (2014), and D'Acunto, Liu, Pflueger, and Weber (2015) suggest substantial costs of nominal price adjustment. Ultimately, Coibion, Gorodnichenko, and Wieland (2012) derive the optimal inflation rate in a New Keynesian model with infrequent occurrences at the zero lower bound and conclude that the welfare-optimal inflation rate is below 2%.

Temporary versus permanent increases in aggregate demand: We document

a positive cross-sectional association between households' inflation expectations and their reported willingness to spend, which is reflected in aggregate real durable consumption growth. Our survey evidence does not speak to the persistence of the increase in spending. The higher purchasing propensity before the increase in VAT during 2006 might reflect pull-forward effects (see also Mian and Sufi (2012)). Pull-forward effects would be consistent with the substitution effect we model in Section II, but they might result in lower consumption expenditure once the higher tax rate is in effect. We indeed see lower real durable consumption growth, and lower readiness to purchase durables, during the first quarters of 2007 (see Figure 7). At the same time, we do not observe a stark drop in real GDP growth in the first quarter of 2007 (see Figure 9). In New Keynesian models, temporary increases in inflation expectations during a liquidity trap are typically required to "jumpstart the economy," and to converge back to the steady state growth pass. Our findings are consistent with this argument.

Fiscal versus monetary policy: Many theory models rely on monetary policy to engineer higher inflation expectations. Our survey data do not allow us to identify the origin of the cross-sectional heterogeneity in inflation expectations. When we use the unexpected increase in VAT as a shock to inflation expectations, we can trace the cause of higher inflation expectations back to fiscal policy. Our findings might therefore not speak to the effects of higher inflation expectations induced by monetary policy. Our baseline findings hold when we exclude the period after the announcement and before the effectiveness of the VAT increase, which alleviates those considerations.

Increases in inflation expectations in good versus bad times: Policy makers and economists typically recommend temporary higher inflation expectations to stimulate higher spending during times of idle demand, when the economy is in a liquidity trap. The basic argument for higher expected inflation to induce higher spending relies on nominal interest rates not moving sufficiently to offset the increase in inflation expectations (see Section II). We saw in section V that this was true during the VAT experiment of 2006. In addition, we show that the positive inflation expectation–readiness to spend nexus also holds during other times. We conjecture larger marginal effects of inflation expectations on the propensity to consume during times of idle demand and slack resources. The preferred policy tools to stimulate inflation expectations might differ, though. We do not read our evidence as suggestive that consumption taxes should be raised during a

liquidity trap. Evidence from Japan suggests that a VAT increase during a liquidity trap might results in a drop in aggregate demand subsequent to the increase (see Hausman and Wieland (2014)).

The case of Germany: We believe that our findings are directly applicable to the case of the United States. The major advantages of using data from Germany is that our survey asks households directly whether they believe it is a good time for *their households* to buy durables rather than for *people in general* as in the MSF. In addition, asking for quantitative inflation expectations leads to several problems and biases against finding any relationship between inflation expectations and households' willingness to purchase consumption goods (see also discussion in Section I). Once researchers control for those shortcomings or condition on households with ex-post accurate inflation expectations, they also find a positive relationship between households' inflation expectation and the reported willingness to purchase durables (see Binder (2015) Table 6 Panel D and Bachmann et al. (2015) Table 5). Evidence for Japan also hints towards a positive relationship between inflation expectations and consumption expenditure (Hausman and Wieland (2014)).

Inflation expectations. Professional forecasters versus households and firms: Economists and the media often focus on the forecasts of professionals such as the Survey of Professional Forecasters in the United States and the Euro Zone, or the ZEW Financial Market Survey, which focuses on Germany and interviews 300 to 350 experts working in banks, insurance, and investment companies. Coibion and Gorodnichenko (2015) and Coibion, Gorodnichenko, and Saten (2014) show that inflation forecasts of households and firms differ substantially from inflation expectations of professional forecasters and financial-market-implied inflation forecasts. They argue that this difference can explain the missing disinflation in the United States. Most firms in the United States and Germany are small and medium-sized enterprises without professional economic forecasters in house, and form expectations similarly to households. The investment decisions of firms, and the consumption decisions of households, ultimately determine the aggregate response of GDP to temporary increases in inflation expectations. In Figure 4, the overall CPI inflation rate, the inflation rate excluding food and energy, and the inflation rate for durable goods all increased sharply in 2007. Figure 6 documents that the standardized one-year lagged inflation expectations index and the realized durable

inflation rate track each other closely, and have a time series correlation of 65.37%. Professionals, on the contrary, did not adjust their forecasts for inflation during 2006 (see Appendix Figures A.2, A.3, and A.4 for inflation forecasts for Germany from Concensus Economics, the ZEW Financial Market Survey, and the ECB Survey of Professional Forecasters for the Euro Zone inflation rate). This finding is consistent with Coibion and Gorodnichenko (2015) for the US: households increased their inflation expectations substantially at the beginning of the recent financial crisis, whereas the inflation expectations of professional forecasters were well anchored and barely moved.

Tax burden and wealth effects: In Section V, we argue that the VAT increase was justified by a need to balance the governmental budget. Economists often favor consumption taxes, because they are less distortionary than income taxes. One might argue that the German government raised direct taxes to lower distortionary indirect taxes. Our baseline effect might, therefore, not be driven by a substitution effect, but by a wealth effect. The narrative record clearly speaks against this interpretation (see discussion below). To directly show that the VAT increase was used to increase the tax base we first show that the total tax to GDP ratio in Germany increased from 34.5% in 2006 to 34.9% in 2007 and the ratio of VAT to GDP from 6.2% to 6.8% (columns (1) and (2) of Table A.8).[14] We then calculate the ratio of tax to GDP under the assumption that the total revenue from VAT is consistent with the average VAT to GDP ratio across the years 2000 to 2006. In column (6), we see that the hypothetical total tax-to-GDP ratio is 34.37%, which implies that other sources of tax income might also have increased. We might, therefore, expect a negative wealth effect, and our marginal effect estimates are likely conservative estimates of the substitution effect.

Reduced and full VAT tax: All services and products in Germany are subject to a value-added tax which is part of the European VAT system. The general tax rate was 16% until December 2006 and increased to 19% in 2007. A reduced rate of 7% applies to many convenience goods such as food, books, or flowers. The reduced rate has been unchanged since 1983. Rent, services for non-profit organizations, and medical expenses are not subject to VAT.

VAT increase as a shock to inflation: Prices in Germany are typically tax-inclusive, i.e., posted prices are gross prices including value-added tax. Many convenience

[14]We thank Ľuboš Pástor for suggesting this test.

goods are only subject to a reduced VAT. If the VAT increase of 2007 indeed led to an increase in inflation, we should observe an immediate rise in inflation for durable goods which are subject to full VAT, whereas we should see a smaller response for non-durable inflation. The lower left panel of Figure 4 shows an immediate increase in durable-good inflation, which remained high throughout 2007. On the contrary, the lower right panel shows a constant non-durable-good inflation rate during 2007. In a frictionless world in which the tax incidence is fully borne by households, a VAT increase would result in a one-time increase in the price level, and not in higher inflation. The actual tax incidence depends on the elasticities of demand and supply. VAT applies to many products, and it is therefore reasonable to assume that consumers bear the tax increase in the long run. In the short run it may, however, take several quarters until the increase in VAT is incorporated in prices due to odd-pricing considerations (see the long marketing literature on odd pricing, e.g., Schindler and Kibarian (1996)).

Identification versus Policy Implications: To interpret our effects causally, we have to control for household characteristics and expectations, which determine purchasing behavior and are correlated with inflation expectations. Policy makers confronted with the decision to engineer higher inflation expectations cannot condition on demographics and idiosyncratic expectations of households. Our findings hold in the aggregate (see Figure 1), without controlling for additional covariates (see Table 2), and following an exogenous shock to inflation expectations (see Table 5). Thus, we believe that our findings have direct policy relevance and policy makers should take them into account when facing the decision of raising inflation expectations.

Election promises during the 2005 campaign and reality: The Christian Democrats (CDU) under the leadership of Mrs. Merkel campaigned to increase VAT by 2% to lower non-wage labor costs (see CDU (2005) page 14). The Social Democrats strongly opposed an increase in VAT and instead favored an increase in income tax by 3% for top income earners (see SPD (2005) page 39). The Greens and Liberals also strongly opposed an increase in VAT. The Liberals, for example, promised to decrease the general tax burden by EUR 19bn. The 2005 general election was a close election. A few days before the election, most polling institutes predicted a victory of a coalition between Christian Democrats and Liberals by a tight margin. Eleven days before the election, the polling institute Infratest Dimap predicted a vote share of 41% for the Christian

Democrats, 34% for the Social Democrats, 8.5% for the Left, 7% for the Greens, and 6.5% for the Liberals.[15] In the actual election on September 18, 2005, the Christian Democrats gained 35.2% electoral support, the Social Democrats 34.2%, the Liberals 9.8%, the Left 8.7%, and the Greens 8.1%. Neither the Christian Democrats nor the Social Democrats were able to form a "small" coalition with their preferred coalition partner (Liberals and Greens, respectively). Finally, the Christian Democrats and Social Democrats formed a "grand" coalition and decided to increase VAT by 3%, lower non-wage labor costs by 1%, and use the additional tax revenue to consolidate the federal budget. The opposition parties and popular press claimed election fraud and criticized the new administration fiercely. The online appendix contains press clippings commenting on the VAT policy of the coalition and campaign posters (see Section III of the online appendix and Figure A.5).

While the Christian Democrats campaigned to increase VAT by 2% to lower indirect taxes, all other parties strongly opposed raising VAT, including their preferred coalition partner, the Liberals. At the same time, the outcome of the election was unclear until the actual election. A VAT increase by 3% for fiscal consolidation was therefore certainly unexpected. Figure 2 is direct evidence that households did not expect higher inflation: households' inflation expectation did not increase until December 2006 after the new administration announced their plans to increase VAT.

VII Concluding Remarks

We document a positive cross-sectional association between households' inflation expectations and their willingness to purchase durable consumption goods using novel German survey data. Households that expect inflation to increase are 8% more likely to have a positive attitude toward buying durable consumption goods than households that expect constant or decreasing inflation. The positive effect of inflation expectations on households' propensity to purchase durable goods is stronger for more educated households, working-age households, high-income households, and urban households. Our findings provide empirical support for the conventional wisdom that temporarily higher inflation expectations can stir consumption expenditure when nominal interest rates are

[15] See: http://www.infratest-dimap.de/en/umfragen-analysen/bundesweit/sonntagsfrage/

constrained by the zero-lower bound.

Two features of the novel German survey data make them ideal for studying the relationship between households' inflation expectations and their readiness to purchase durable consumption goods. First, households are asked explicitly about their *own* willingness to purchase durable consumption goods, as opposed to their opinion on whether now is generally a good time for *people* to buy, as in similar surveys in the United States. Second, the German setting allows us to exploit the unexpected announcement of an increase in VAT in 2005. This shock is close to the ideal experiment of exogenously increasing households' inflation expectations, and helps with the identification of the effect of inflation expectations on households' willingness to spend on durable goods. Indeed, the size of the estimated effect more than doubles during 2006. Interestingly, the effect builds up during 2006 even though the VAT increase was announced in November 2005. The temporal buildup suggests some households were inattentive to policy announcements, and only reacted after the media covered the consequences of the VAT increase in greater detail.

Our findings have a set of policy implications. The heterogeneous effect across households and the delayed response in 2006 suggest the transmission of policies to actual behavior may be hindered by the inability of households to understand the consequences of those interventions. Increased policy transparency and higher financial and economic literacy could help households understand the implications of monetary and fiscal policies for inflation, consumption, and savings.

The delayed response in households' inflation expectations suggests an important avenue for future research. Studies could examine which household characteristics, such as limited attention or cognitive abilities, hinder households from updating expectations about future realizations of macroeconomic variables. These characteristics may represent major impediments to the transmission of economic and monetary policies that target households' consumption and savings behaviors, and might result in unintended consequences such as the redistribution of wealth.

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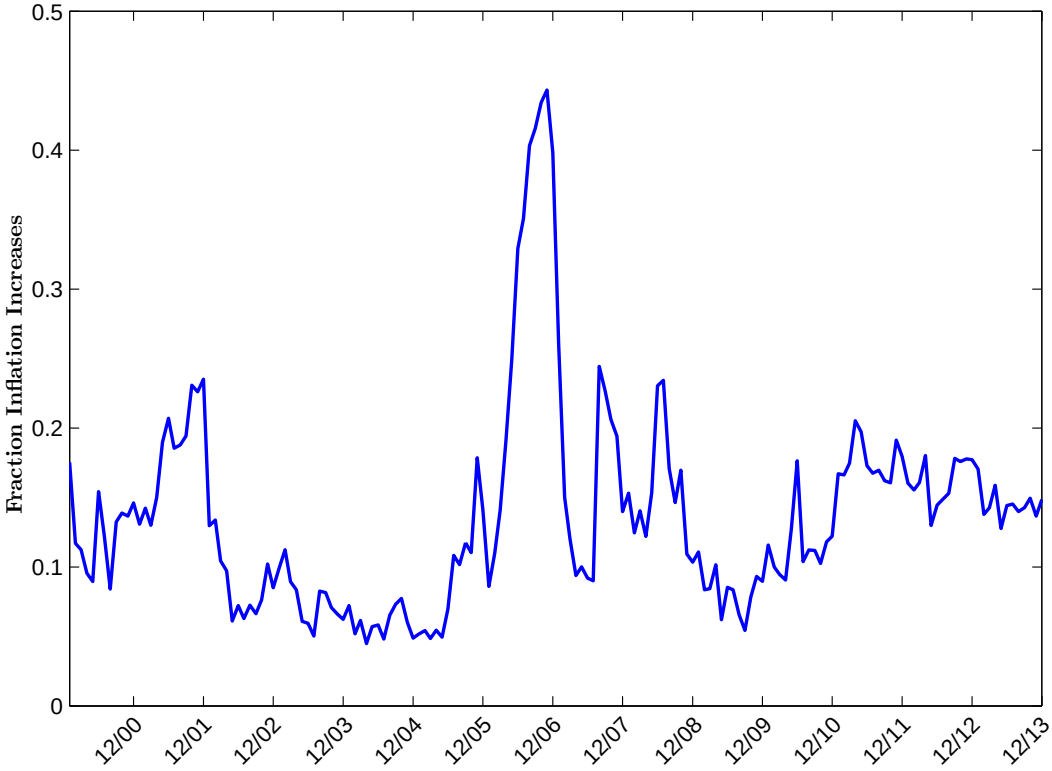
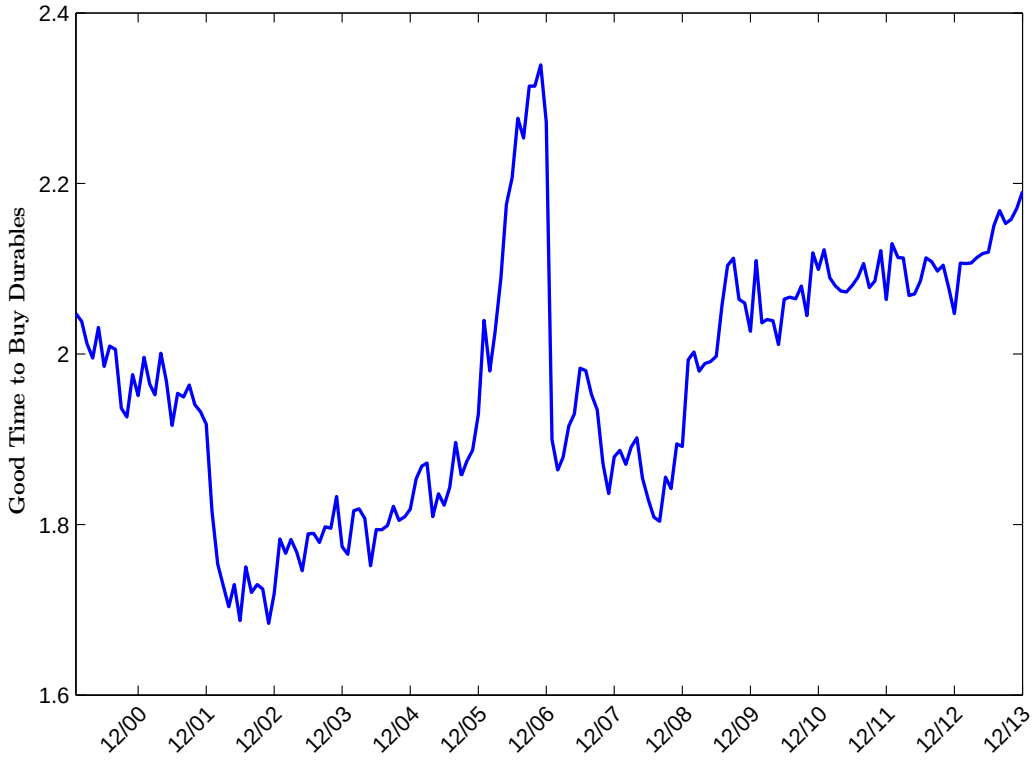
Figure 2: **Expected Increase in Inflation**



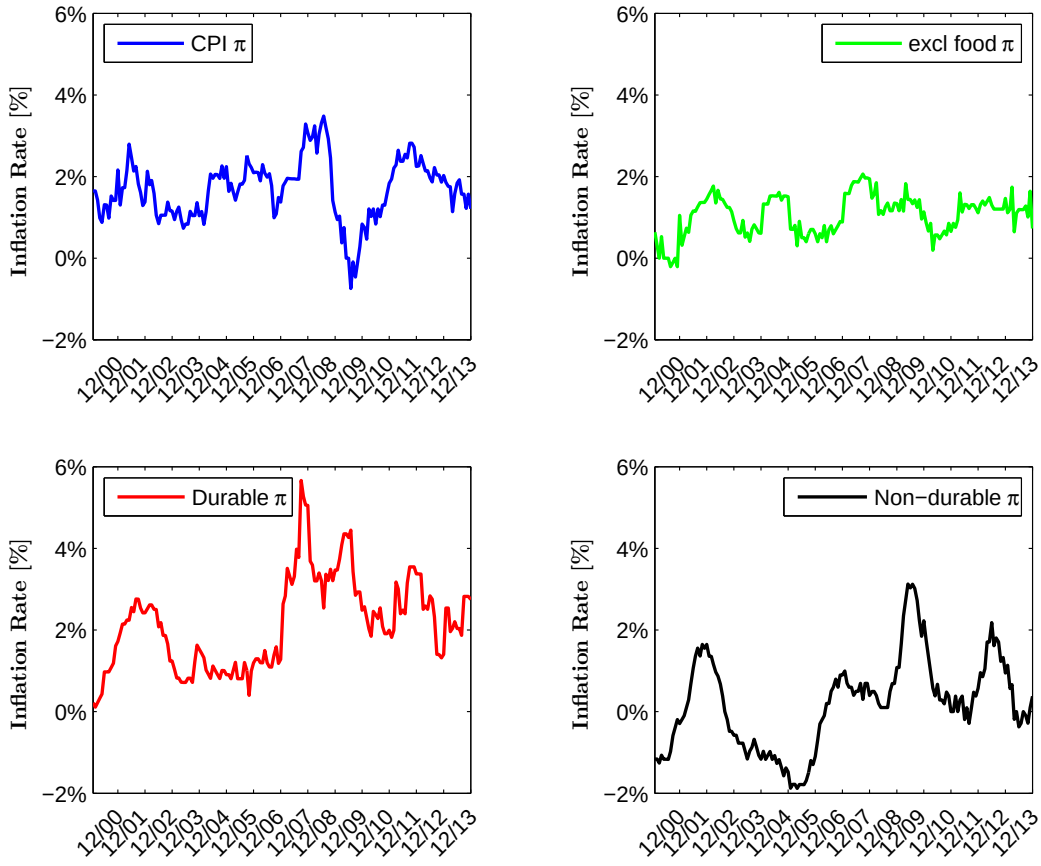
This figure plots average monthly inflation expectation over time. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct this variables. GfK asks a representative sample of 2,000 households how consumer prices will evolve in the next twelve months compared to the previous twelve months. We create a dummy variable which equals 1 when a household expects inflation to increase. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure 3: **Average Readiness to Spend on Durables**



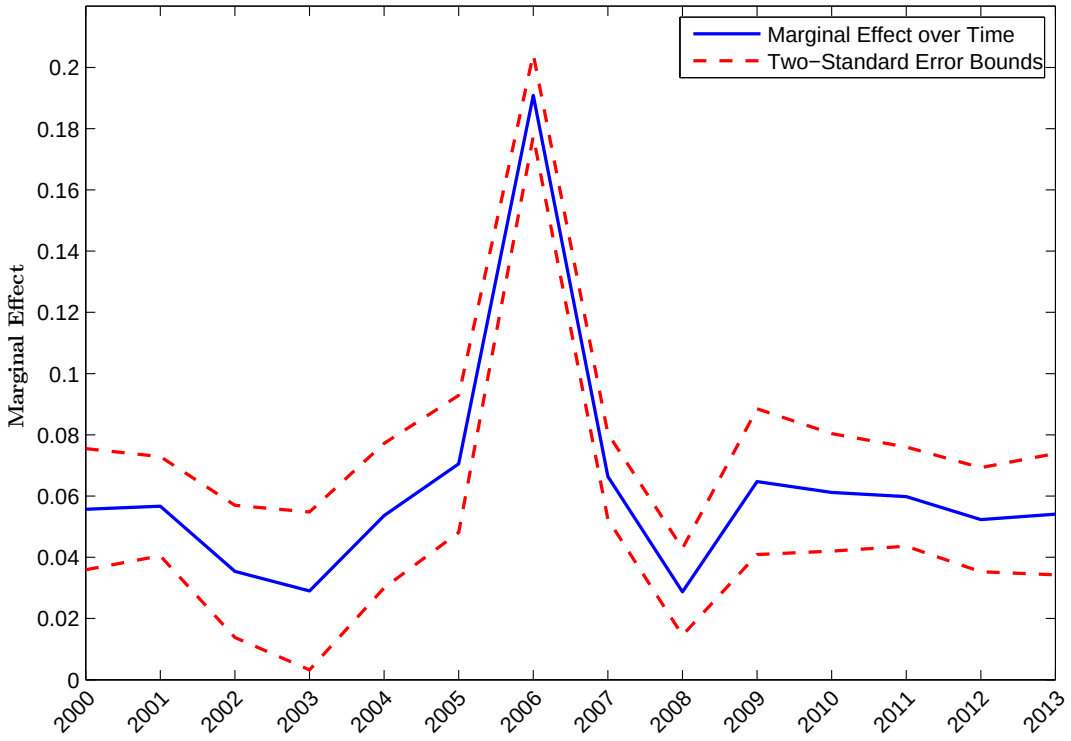
This figure plots average monthly readiness to purchase durables over time. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct this variables. GfK asks a representative sample of 2,000 households whether it is a good time to purchase durables given the current economic conditions. Higher values correspond to better times. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure 4: **Time Series of CPI Inflation rate**



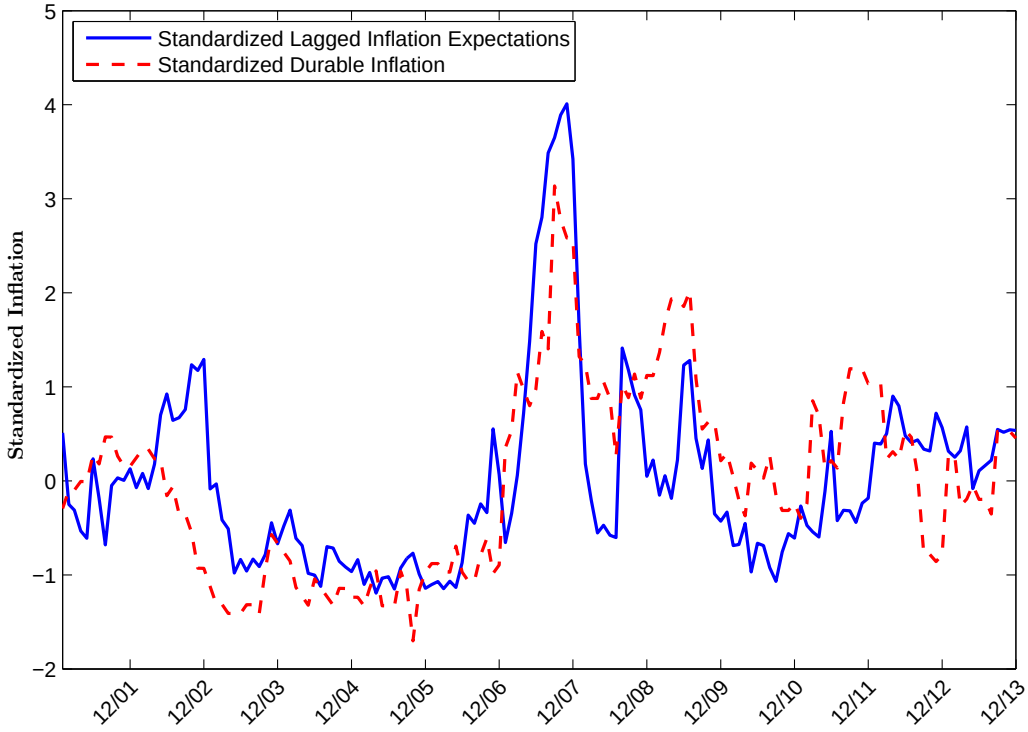
This figure plots the monthly time series of the German consumer price (CPI) inflation rate π in percent at an annual rate. The top left panel plots the harmonized overall consumer price inflation rate. The top right panel plots the all items CPI excluding food and energy. The bottom left panel plots major durables CPI. The bottom right panel plots the non-durable households goods CPI. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure 5: **Readiness to spend on durables and inflation expectations over time**



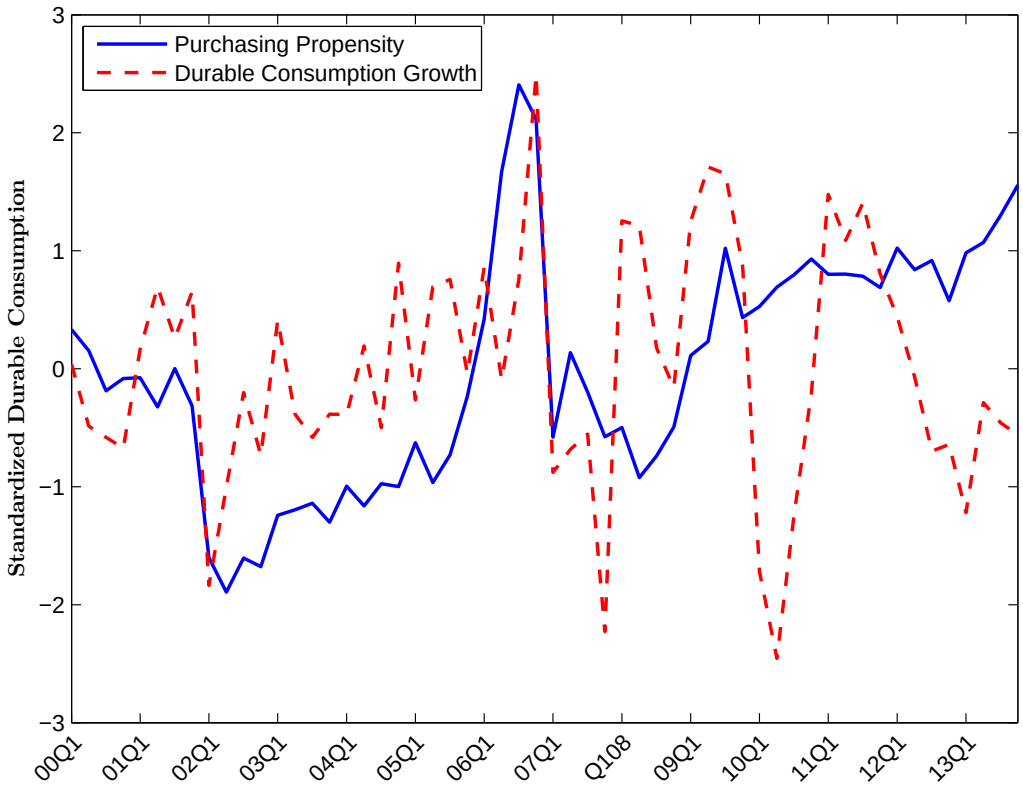
This figure plots the average marginal effect of inflation expectation on households' readiness to purchase durable goods of a multinomial logit regression over time and two standard deviation error bands. Inflation expectation is a dummy variable which equals 1 when a household replies that inflation will increase. The same covariates as in Table 5 were added. We use the micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure 6: **Standardized Lagged Inflation Expectations and CPI Inflation rate**



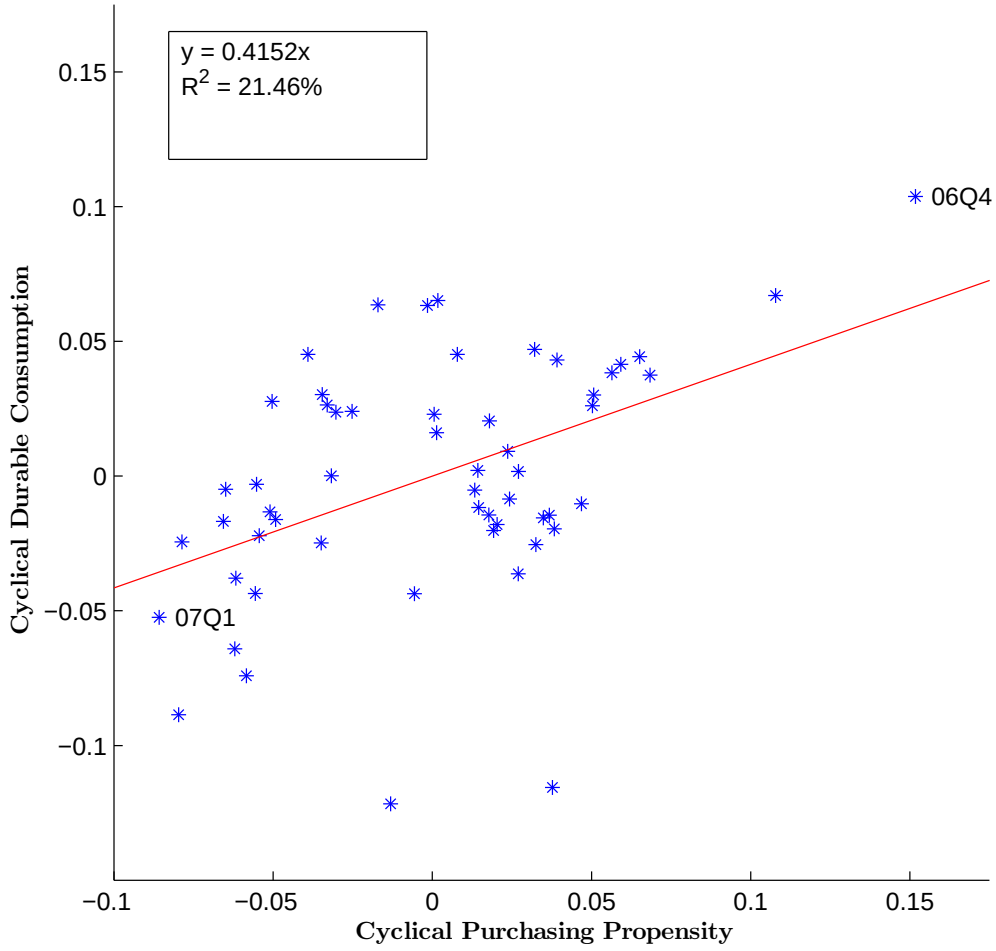
This figure plots the monthly time series of the one-year lagged standardized average monthly inflation expectation and the harmonized major durables consumer price inflation rate in percent at an annual rate. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct inflation expectations. GfK asks a representative sample of 2,000 households how consumer prices will evolve in the next twelve months compared to the previous twelve months. We create a dummy variable which equals 1 when a household expects inflation to increase. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure 7: **Average Readiness to Spend on Durables and Real Durable Consumption Growth**



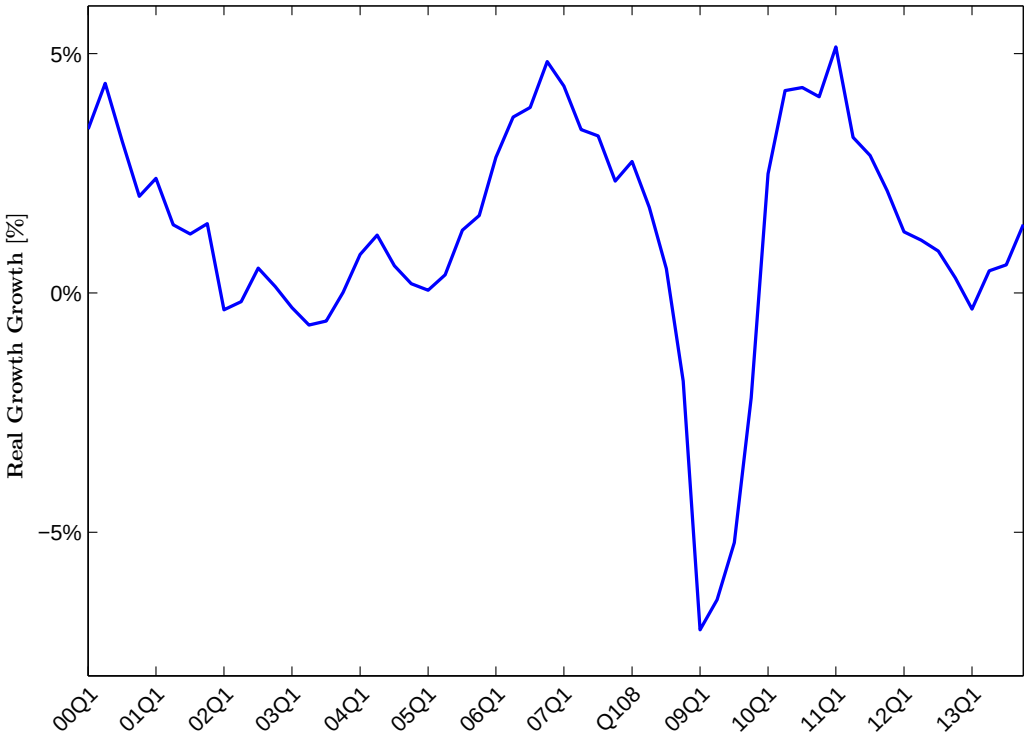
This figure plots average monthly readiness to purchase durables over time and the realized real durable consumption growth. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct the readiness to purchase durables index. GfK asks a representative sample of 2,000 households whether it is a good time to purchase durables given the current economic conditions. Higher values correspond to better times. We use the end of quarter value to get a quarterly time series. The sample period is first quarter 2000 to fourth quarter 2013 for a total of fourteen years.

Figure 8: **Cyclical Readiness to Spend on Durables and Real Durable Consumption**



This figure is a scatter plot of the cyclical components of the average monthly readiness to purchase durables over time and of the natural logarithm of the real durable consumption at the quarterly frequency. We use a Hodrick–Prescott filter with smoothing parameter $\lambda = 1,600$ to estimate to cyclical component. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct the readiness to purchase durables index. GfK asks a representative sample of 2,000 households whether it is a good time to purchase durables given the current economic conditions. Higher values correspond to better times. We use the end of quarter value to get a quarterly time series. The sample period is fist quarter 2000 to forth quarter 2013 for a total of fourteen years.

Figure 9: **Real GDP Growth**



This figure plots the monthly time series of the German real quarterly GDP growth in percent at an annual rate. The sample period is first quarter 2000 to forth quarter 2013 for a total of fourteen years.

Table 1: **Descriptive Statistics**

This table reports descriptive statistics for households' inflation expectations and readiness to purchase durables in Panel A, household demographics in Panel B, household expectations and perceptions in Panel C, and macroeconomics aggregates in Panel D. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to measure the variables in Panel A to Panel C. GfK asks a representative sample of 2,000 households questions about general economic expectations, income expectations, and willingness to buy in order to create an aggregate measure labeled "consumer climate." For Panel A, GfK asks whether it is a good time to purchase durables given the current economic conditions. GfK also asks how consumer prices will evolve in the next twelve months compared to the previous twelve months. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. GfK also asks how consumer prices evolved in the previous twelve months. See the online appendix for data sources and detailed data definitions. The sample period is January 2000 to December 2013 for a total of fourteen years.

		Nobs	Mean	Std	Min	p25	p50	p75	Max
Panel A: Inflation expectations and readiness to spend									
Readiness to buy durables	Good time	326,011	20.26%						
	Neither		56.15%						
	Bad time		23.59%						
Inflation increase		355,400	13.77%	0.34	0	0	0	0	1
Inflation perception	increased substantially	348,521	28.06%						
	increased somewhat		29.69%						
	increased slightly		27.80%						
	remained the same		13.23%						
	decreased		1.23%						
Panel B: Household demographics									
Sex	Male	355,400	53.83%						
	Female		46.17%						
Age		355,400	46.07	17.49	14	33	45	60	99
Education	Hauptschule	350,093	42.74%						
	Realschule		38.96%						
	Gymnasium		10.34%						
	Universitaet		7.97%						
Household members		355,400	2.49	1.17	1	2	2	3	5
City	City<9,999	355,400	28.24%						
	9,999<=City<49,999		34.46%						
	50,000<=City<199,999		15.66%						
	199,999<=City		21.64%						
Kids at home	yes	355,400	26.88%						
	no		73.12%						
Number of kids		352,256	0.42	0.78	0	0	0	1	4
Net income (inc)	inc< 1,000	270,592	43.60%						
	1,000<=inc<1,500		28.66%						
	1,500<=inc<2,500		20.81%						
	2,500<=inc		6.93%						
Panel C: Household expectations and perceptions									
Past Financial situation	Improved substantially	351,486	0.02						
	Improved somewhat		0.12						
	Identical		0.61						
	Worsened somewhat		0.21						
	Worsened substantially		0.05						
Financial outlook	Improves substantially	341,105	0.01						
	Improves somewhat		0.11						
	Identical		0.73						
	Worsens somewhat		0.13						
	Worsens substantially		0.02						
Current financial situation	Save a lot	345,683	0.04						
	Save little		0.39						
	Don't save		0.41						
	Dissave		0.13						
	Take on debt		0.02						
Expected unemployment rate	Increases substantially	342,563	14.10						
	Increases somewhat		32.24						
	Identical		35.28						
	Decreases somewhat		17.27						
	Decreases a lot		1.12						

continued on next page

Table 1: **Descriptive Statistics continued**

Continued from previous page.

	Nobs	Mean	Std	Min	p25	p50	p75	Max
Panel D: Macroeconomic aggregates								
CPI Inflation	355,400	1.61%	0.65%	−0.50%	1.21%	1.64%	1.98%	3.27%
Unemployment rate	355,400	8.99	1.61	6.40	7.60	9.00	10.30	12.70
European Uncertainty Index	355,400	134.25	62.78	46.61	83.54	116.53	170.93	331.54
German Uncertainty Index	355,400	119.79	57.60	28.43	79.13	106.68	144.33	377.84
MRO rate	355,400	3.09	1.53	0.25	1.00	4.25	4.25	4.25
Dax	355,400	5840	1511	2424	4769	5970	6949	9552
Volatility DAX	355,400	22.79	8.67	11.24	16.88	20.62	25.91	57.96
Industrial Production Growth	355,400	1.60%	6.97%	−27.25%	0.00%	2.41%	5.65%	14.55%
Oil Price	355,400	63.42	33.66	18.71	29.80	58.76	94.99	132.72

Table 2: **Inflation Expectations and Readiness to Spend: Baseline**

This table reports the average marginal effects of a multinomial logit regression. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years.

	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)
Inflation Increase	0.0461***	0.0624***	0.0225**	0.0749***
	(0.0109)	(0.0162)	(0.0091)	(0.0152)
Past Inflation			0.0632***	−0.0342***
			(0.0048)	(0.0028)
Pseudo R^2	0.0031		0.0161	
Nobs	326,011		321,496	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 3: **Inflation Expectations and Readiness to Spend: Demographics and Expectations**

This table reports the average marginal effects of a multinomial logit regression. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics, household expectations, and contemporaneous macroeconomic variables. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct the survey variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years.

	Bad time (1)	Good time (2)	Bad time (3)	Good time (4)	Bad time (5)	Good time (6)
Inflation increase	0.0242***	0.0755***	−0.0078	0.0888***	0.0051	0.0875***
	(0.0094)	(0.0156)	(0.0083)	(0.0160)	(0.0073)	(0.0116)
Past Inflation	0.0570***	−0.0300***	0.0376***	−0.0200***	0.0331***	−0.0114***
	(0.0045)	(0.0030)	(0.0033)	(0.0035)	(0.0020)	(0.0023)
Sex	−0.0285***	−0.0074***	−0.0146***	−0.0144***	−0.0098***	−0.0155***
	(0.0025)	(0.0019)	(0.0024)	(0.0020)	(0.0023)	(0.0019)
Age	0.0018***	−0.0008**	−0.0023***	0.0015***	−0.0017***	0.0013***
	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)	(0.0003)
Age^2	−0.0000***	0.0000	0.0000***	−0.0000***	0.0000***	−0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Education	−0.0301***	0.0261***	−0.0198***	0.0199***	−0.0174***	0.0192***
	(0.0016)	(0.0010)	(0.0016)	(0.0012)	(0.0017)	(0.0012)
Hh size	−0.0118***	0.0066***	−0.0034***	0.0024**	−0.0047***	0.0027**
	(0.0012)	(0.0013)	(0.0011)	(0.0012)	(0.0012)	(0.0012)
City size	0.0004	0.0006	0.0008	0.0001	0.0001	0.0004
	(0.0007)	(0.0005)	(0.0007)	(0.0006)	(0.0007)	(0.0006)
Marital Status	0.0091***	−0.0026**	0.0037***	−0.0001	0.0009	0.0003
	(0.0016)	(0.0013)	(0.0013)	(0.0012)	(0.0012)	(0.0011)
Kids home	0.0078	0.0027	0.0061	0.005	0.0042	0.0053
	(0.0048)	(0.0045)	(0.0046)	(0.0050)	(0.0043)	(0.0049)
\# kids	0.0192***	−0.0094***	0.0102***	−0.0038	0.0103***	−0.0041
	(0.0028)	(0.0026)	(0.0027)	(0.0026)	(0.0026)	(0.0026)
Housing	0.0216***	−0.0073***	0.0125***	−0.0029**	0.0133***	−0.0031***
	(0.0013)	(0.0012)	(0.0013)	(0.0012)	(0.0011)	(0.0012)
Job	0.0215***	−0.0066***	0.0046***	0.0023	0.0047***	0.0018
	(0.0017)	(0.0020)	(0.0014)	(0.0020)	(0.0013)	(0.0019)
State	0.0018***	−0.0017***	−0.0002	−0.0008**	−0.0004	−0.0008**
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0003)
Income	−0.0147***	0.0084***	−0.0079***	0.0047***	−0.0070***	0.0044***
	(0.0006)	(0.0007)	(0.0007)	(0.0007)	(0.0006)	(0.0007)
Past financial situation			−0.0613***	0.0334***	−0.0526***	0.0324***
			(0.0027)	(0.0021)	(0.0017)	(0.0019)
Financial outlook			−0.0236***	0.0215***	−0.0192***	0.0206***
			(0.0025)	(0.0030)	(0.0019)	(0.0027)
Current financial situation			0.0000	−0.0008	0.0103**	−0.0078*
			(0.0049)	(0.0037)	(0.0051)	(0.0041)
Exp GDP growth			−0.0293***	0.0300***	−0.0277***	0.0298***
			(0.0023)	(0.0025)	(0.0019)	(0.0022)
Exp unemployment rate			0.0315***	−0.0024	0.0270***	−0.0103***
			(0.0028)	(0.0040)	(0.0014)	(0.0021)
Saving propensity			−0.0498***	0.0386***	−0.0549***	0.0416***
			(0.0041)	(0.0028)	(0.0035)	(0.0025)
Good time to save			0.0067***	−0.0279***	0.0004	−0.0265***
			(0.0023)	(0.0036)	(0.0018)	(0.0033)
CPI Inflation					1.4513	−4.9889**
					(1.4110)	(2.1874)
Unemployment rate					−0.0076*	0.0165**
					(0.0043)	(0.0075)
European uncertainty					0.0000	−0.0003*
					(0.0001)	(0.0002)
German uncertainty					−0.0002*	0.0004***
					(0.0001)	(0.0001)
Policy rate					0.0134*	−0.0033
					(0.0079)	(0.0124)
Dax					−0.0000***	0.0000
					(0.0000)	(0.0000)
Vdax					−0.0002	0.0000
					(0.0006)	(0.0009)
IP growth					−0.0594	−0.0207
					(0.0812)	(0.1170)
Oil price					−0.0008***	0.0009*
					(0.0003)	(0.0005)
Δ Oil price					0.0327*	−0.0313
					(0.0172)	(0.0265)
Pseudo R^2	0.0292		0.0654		0.0762	
Nobs	244,497		219,799		219,799	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 4: **Inflation Expectations and Readiness to Spend: Individual Expectations**

This table reports the average marginal effects of a multinomial logit regression for different subsets of households. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time or it is neither a good time nor a bad time. Standard errors are clustered at the quarter–year level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) to (4) split the sample based on the median GDP growth expectations over the next twelve months. Columns (5) to (8) split the sample based on the median unemployment expectations over the next twelve months.

	Higher growth outlook		Lower growth outlook		Lower unemployment outlook		Higher unemployment outlook	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0058	0.0841***	0.0289***	0.0729***	0.0002	0.0686***	0.0267***	0.0763***
	(0.0115)	(0.0191)	(0.0090)	(0.0142)	(0.0115)	(0.0249)	−0.0088	−0.0135
Past Inflation	0.0477***	−0.0355***	0.0657***	−0.0320***	0.0342***	−0.0271***	0.0676***	−0.0340***
	(0.0049)	(0.0038)	(0.0047)	(0.0028)	(0.0043)	(0.0047)	(0.0048)	(0.0031)
Pseudo R^2	0.0115		0.0171		0.0065		0.0180	
Nobs	70,000		251,496		58,186		263,310	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 5: **Inflation Expectations and Readiness to Spend: VAT Experiment**

This table reports the average marginal effects of a multinomial logit regression for different time periods. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to 11/2005 – 12/2006 to study the effect of the unexpected VAT increase in 2007 which was announced in November 2005, columns (3) and (4) exclude the period 11/2005 – 12/2006, and columns (5) and (6) restrict the sample to 2010 to 2012 to study the effect of the European sovereign debt crisis.

	11/2005 – 12/2006		excluding 11/2005 – 12/2006		2010–2012	
	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)
Inflation increase	−0.0594***	0.1909***	0.0049	0.0547***	0.0058	0.0576***
	(0.0062)	(0.0067)	(0.0053)	(0.0031)	(0.0043)	(0.0052)
Past Inflation	0.0160***	0.0206***	0.0384***	−0.0146***	0.0237***	−0.0129***
	(0.0027)	(0.0033)	(0.0034)	(0.0021)	(0.0021)	(0.0043)
Demographics	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X
Pseudo R^2	0.0631		0.0676		0.0466	
Nobs	19,477		200,322		48,982	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 6: **Inflation Expectations and Readiness to Spend: by Education**

This table reports the average marginal effects of a multinomial logit regression for different levels of education. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents with a Hauptschule degree (nine years of schooling), columns (3) and (4) to respondents with a Realschule degree (ten years of schooling), columns (5) and (6) to respondents with a Gymnasium degree (thirteen years of schooling), and columns (7) and (8) to respondents with a university degree.

	Hauptschule		Realschule		Gymnasium		University	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	0.0108	0.0689***	−0.0117	0.0985***	−0.0342***	0.0979***	−0.0387***	0.1128***
	(0.0105)	(0.0152)	(0.0080)	(0.0162)	(0.0118)	(0.0225)	(0.0080)	(0.0188)
Past Inflation	0.0414***	−0.0194***	0.0373***	−0.0188***	0.0319***	−0.0264***	0.0252***	−0.0214***
	(0.0034)	(0.0032)	(0.0034)	(0.0038)	(0.0047)	(0.0048)	(0.0045)	(0.0057)
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0673		0.0635		0.0415		0.0508	
Nobs	89,991		88,315		23,282		18,211	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 7: **Inflation Expectations and Readiness to Spend: Age**

This table reports the average marginal effects of a multinomial logit regression for different age groups. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents below age 21, columns (3) and (4) to respondents between age 21 and 35, columns (5) and (6) to respondents between age 35 and 50, columns (7) and (8) to respondents between age 50 and 65, and columns (9) and (10) to respondents above age 65.

	Age $\leq$ 21		21 $<$ Age $\leq$ 35		35 $<$ Age $\leq$ 50		50 $<$ Age $\leq$ 65		65 $<$ Age	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Inflation increase	−0.0089	0.0934***	−0.0111	0.0906***	−0.0087	0.0938***	−0.0136	0.0910***	0.0038	0.0694***
	(0.0134)	(0.0211)	(0.0099)	(0.0191)	(0.0084)	(0.0173)	(0.0089)	(0.0147)	(0.0095)	(0.0134)
Past Inflation	0.0397***	−0.0223***	0.0367***	−0.0179***	0.0361***	−0.0201***	0.0362***	−0.0218***	0.0420***	−0.0216***
	(0.0058)	(0.0043)	(0.0040)	(0.0044)	(0.0034)	(0.0034)	(0.0036)	(0.0038)	(0.0037)	(0.0037)
Demographics	X	X	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X	X	X
Pseudo R^2	0.0447		0.0664		0.0745		0.0668		0.0639	
Nobs	14,913		47,702		70,004		52,186		34,994	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 8: **Inflation Expectations and Readiness to Spend: by City Size**

This table reports the average marginal effects of a multinomial logit regression for different city sizes. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents living in cities with less than 1,999 inhabitants, columns (3) and (4) to respondents living in cities between 1,999 and 19,999 inhabitants, columns (5) and (6) to respondents living in cities between 19,999 and 99,999 inhabitants, and columns (7) and (8) to respondents living in cities with more than 99,999 inhabitants.

	City $\leq$ 1,999		1,999 $<$ City $\leq$ 19,999		19,999 $<$ City $\leq$ 99,999		99,999 $<$ City	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0123	0.0581***	0.0018	0.0847***	0.0002	0.0854***	−0.0244***	0.1013***
	(0.0132)	(0.0199)	(0.0086)	(0.0151)	(0.0102)	(0.0217)	(0.0092)	(0.0133)
Past Inflation	0.0414***	−0.0196***	0.0298***	−0.0187***	0.0414***	−0.0264***	0.0415***	−0.0177***
	(0.0052)	(0.0055)	(0.0036)	(0.0034)	(0.0037)	(0.0038)	(0.0040)	(0.0042)
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0738		0.0632		0.0721		0.0656	
Nobs	17,833		74,937		59,674		67,355	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 9: **Inflation Expectations and Readiness to Spend: Household Size**

This table reports the average marginal effects of a multinomial logit regression for different households sizes. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents living in a household of size 1, columns (3) and (4) to respondents living in a household of size 2, columns (5) and (6) to respondents living in a household of size 3, columns (7) and (8) to respondents living in a household of size 4, and columns (9) and (10) to respondents between living in a household of size 5.

	Household size: 1		Household size: 2		Household size: 3		Household size: 4		Household size: 5	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Inflation increase	−0.0064	0.0820***	−0.0098	0.0881***	−0.0107	0.0874***	−0.0051	0.0998***	0.0009	0.0946***
	(0.0090)	(0.0157)	(0.0096)	(0.0164)	(0.0096)	(0.0167)	(0.0090)	(0.0171)	(0.0144)	(0.0210)
Past Inflation	0.0426***	−0.0198***	0.0366***	−0.0205***	0.0369***	−0.0209***	0.0350***	−0.0179***	0.0351***	−0.0221***
	(0.0036)	(0.0036)	(0.0033)	(0.0036)	(0.0040)	(0.0045)	(0.0034)	(0.0039)	(0.0056)	(0.0045)
Demographics	X	X	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X	X	X
Pseudo R^2	0.0662		0.0657		0.0658		0.0691		0.0632	
Nobs	50,027		82,026		41,909		34,103		11,734	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 10: **Inflation Expectations and Readiness to Spend: Sex and Kids**

This table reports the average marginal effects of a multinomial logit regression separately for male and female and households with and without children. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to female respondents, columns (3) and (4) to male respondents, columns (5) and (6) to respondents with children, and columns (7) and (8) to respondents without children.

	Female		Male		Children		No Children	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0137	0.0910***	−0.0013	0.0861***	−0.008	0.0893***	−0.0076	0.0879***
	(0.0094)	(0.0161)	(0.0077)	(0.0162)	(0.0094)	(0.0174)	(0.0083)	(0.0157)
Past Inflation	0.0381***	−0.0185***	0.0370***	−0.0217***	0.0362***	−0.0193***	0.0378***	−0.0200***
	(0.0031)	(0.0038)	(0.0036)	(0.0034)	(0.0040)	(0.0038)	(0.0032)	(0.0036)
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0636		0.067		0.0686		0.0644	
Nobs	115,715		104,084		58,705		163,186	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 11: **Inflation Expectations and Readiness to Spend: Marital Status**

This table reports the average marginal effects of a multinomial logit regression by marital status. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to single respondents, columns (3) and (4) to respondents in a relationship, columns (5) and (6) to married respondents, and columns (7) and (8) to divorced respondents.

	Single		Couple		Married		Divorced	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0147	0.0905***	−0.0171	0.0824***	−0.0021	0.0925***	−0.0122	0.0777***
	(0.0093)	(0.0177)	(0.0113)	(0.0179)	(0.0085)	(0.0157)	(0.0111)	(0.0157)
Past Inflation	0.0385***	−0.0218***	0.0356***	−0.0173***	0.0354***	−0.0210***	0.0442***	−0.0177***
	(0.0040)	(0.0042)	(0.0046)	(0.0047)	(0.0030)	(0.0037)	(0.0041)	(0.0034)
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0575		0.0695		0.0678		0.0677	
Nobs	46,701		25,008		111,760		36,330	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 12: **Inflation Expectations and Readiness to Spend: Homeownership**

This table reports the average marginal effects of a multinomial logit regression by home ownership. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to home owners, columns (3) and (4) to apartment owners, and columns (5) and (6) to renters.

	House owner		Apartment owner		Renter	
	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)
Inflation increase	−0.0038	0.0834***	−0.0115	0.0766***	−0.0105	0.0938***
	(0.0080)	(0.0173)	(0.0120)	(0.0191)	(0.0096)	(0.0156)
Past Inflation	0.0342***	−0.0216***	0.0306***	−0.0228***	0.0410***	−0.0186***
	(0.0032)	(0.0034)	(0.0042)	(0.0048)	(0.0035)	(0.0039)
Demographics	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X
Pseudo R^2	0.0616		0.0607		0.0665	
Nobs	90,021		13,641		116,137	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 13: **Inflation Expectations and Readiness to Spend: Employment**

This table reports the average marginal effects of a multinomial logit regression by employment status. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it's neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to full-time employed respondents, columns (3) and (4) to part-time employed respondents, and columns (5) and (6) to unemployed respondents.

	Full-time Employment		Part-time Employment		Not Employed	
	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)
Inflation increase	−0.0051	0.0923***	−0.0072	0.0845***	−0.0103	0.0852***
	(0.0080)	(0.0169)	(0.0100)	(0.0186)	(0.0098)	(0.0149)
Past Inflation	0.0345***	−0.0202***	0.0355***	−0.0209***	0.0413***	−0.0203***
	(0.0034)	(0.0038)	(0.0034)	(0.0042)	(0.0035)	(0.0035)
Demographics	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X
Pseudo R^2	0.0655		0.0623		0.0617	
Nobs	96,555		30,238		93,006	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 14: **Inflation Expectations and Readiness to Spend: Income**

This table reports the average marginal effects of a multinomial logit regression by net income. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter–year level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents with monthly income below EUR 1,000, columns (3) and (4) to respondents with monthly net income between EUR 1,000 and EUR 2,500, and columns (5) and (6) to respondents with monthly net income above EUR 2,500.

	Income $\leq$ 1,000		1,000 $<$ Income $\leq$ 2,500		2,500 $<$ Income	
	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)
Inflation increase	−0.0099	0.0898***	−0.0055	0.0851***	−0.0109	0.1048***
	(0.0105)	(0.0168)	(0.0078)	(0.0151)	(0.0077)	(0.0203)
Past Inflation	0.0423***	−0.0194***	0.0351***	−0.0192***	0.0277***	−0.0299***
	(0.0036)	(0.0037)	(0.0032)	(0.0036)	(0.0043)	(0.0045)
Demographics	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X
Pseudo R^2	0.0655		0.0596		0.0504	
Nobs	96,555		112,710		16,477	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table 15: **Inflation Expectations and Readiness to Spend: Contrained**

This table reports the average marginal effects of a multinomial logit regression by financial constraints. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to respondents who report that they currently save or save a lot, and columns (3) and (4) to respondents who report that they dis-save or take on debt.

	Unconstrained		Constrained	
	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)
Inflation Increase	−0.0057	0.1042***	−0.0105	0.0747***
	(0.0066)	(0.0180)	(0.0101)	(0.0146)
Past Inflation	0.0345***	−0.0250***	0.0388***	−0.0159***
	(0.0027)	(0.0038)	(0.0040)	(0.0035)
Pseudo R^2	0.0615		0.0608	
Nobs	98,344		121,455	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Online Appendix:
Inflation Expectations and Consumption Expenditure

Francesco D'Acunto, Daniel Hoang, and Michael Weber

Not for Publication

I Survey Questions

Below we report the original survey questions with answer choices, as well as the English translation.

Question 1 *Wie hat sich Ihrer Meinung nach die "allgemeine Wirtschaftslage" in Deutschland in den letzten 12 Monaten entwickelt?*

Sie ...

- hat sich wesentlich verbessert
- hat sich etwas verbessert
- ist in etwa gleich geblieben
- hat sich etwas verschlechtert
- hat sich wesentlich verschlechtert
- weiss nicht

Question 2 *Wie haben sich Ihrer Ansicht nach die Verbraucherpreise in den letzten 12 Monaten entwickelt?*

Sie sind ...

- stark gestiegen
- in Massen gestiegen
- leicht gestiegen
- in etwa gleich geblieben
- gesunken
- weiss nicht

Question 3 *Wie werden sich Ihrer Ansicht nach die Verbraucherpreise in den kommenden 12 Monaten im Vergleich zu den letzten 12 Monaten entwickeln?*

Sie werden ...

- staerker als bisher steigen
- etwa im gleichen Masse wie bisher steigen
- weniger stark als bisher steigen
- in etwa gleich bleiben

- gesunken
- weiss nicht

Question 4 *Wie hat sich die finanzielle Lage Ihres Haushaltes in den letzten 12 Monaten entwickelt?*

Sie ...

- hat sich wesentlich verbessert
- hat sich etwas verbessert
- ist in etwa gleichgeblieben
- hat sich etwas verschlechtert
- hat sich wesentlich verschlechtert
- weiss nicht

Question 5 *Wie wird sich Ihrer Ansicht nach die finanzielle Lage Ihres Haushaltes in den kommenden 12 Monaten entwickeln?*

Sie wird ...

- sich wesentlich verbessern
- sich etwas verbessern
- in etwa gleichbleiben
- sich etwas verschlechtern
- sich wesentlich verschlechtern
- weiss nicht

Question 6 *Wie wird sich Ihrer Ansicht nach die allgemeine Wirtschaftslage in Deutschland in den kommenden 12 Monaten entwickeln?*

Sie wird ...

- sich wesentlich verbessern
- sich etwas verbessern
- in etwa gleichbleiben
- sich etwas verschlechtern
- sich wesentlich verschlechtern
- weiss nicht

Question 7 *Wie ist die derzeitige finanzielle Lage Ihres Haushaltes?*

- wir sparen viel
- wir sparen ein wenig
- wir kommen mit unseren finanziellen Mitteln so gerade aus
- wir greifen etwas unsere Ersparnisse an
- wir verschulden uns
- weiss nicht

Question 8 *Glauben Sie, dass es in Anbetracht der allgemeinen Wirtschaftslage derzeit guenstig ist, groessere Anschaffungen (Moebel, elektrische/elektronische Geraete usw.) zu taetigen?*

- ja, jetzt der Augenblick ist guenstig
- der Augenblick ist weder besonders guenstig noch besonders unguenstig
- nein, der Augenblick ist nicht guenstig
- weiss nicht

Question 10 *Wie wird sich Ihrer Ansicht nach die Zahl der Arbeitslosen in Deutschland in den kommenden 12 Monaten entwickeln?*

Die Zahl wird ...

- stark steigen
- leicht steigen
- in etwa gleich bleiben
- leicht zurueckgehen
- stark zurueckgehen
- weiss nicht

Question 11 *Wollen Sie in den kommenden 12 Monaten fuer groessere Anschaffungen (Moebel, elektrische /elektronische Geraete usw.) mehr oder weniger ausgeben als in den letzten 12 Monaten?*

Ich werde ...

- wesentlich mehr ausgeben
- etwas mehr ausgeben
- in etwa gleich viel ausgeben
- etwas weniger ausgeben
- wesentlich weniger ausgeben
- weiss nicht

Question 12 *Wie wahrscheinlich ist es, dass Sie in den kommenden 12 Monaten Geld sparen werden?*

- sehr wahrscheinlich
- recht wahrscheinlich
- unwahrscheinlich
- sehr unwahrscheinlich
- weiss nicht

Question 13 *Glauben Sie, dass es in Anbetracht der allgemeinen Wirtschaftslage derzeit ratsam ist, zu sparen?*

- ja, auf alle Faelle
- wahrscheinlich ja
- eher nicht
- auf keinen Fall
- weiss nicht

Question 1 *How did you perceive the general economic situation in Germany over the last 12 months?*

It ...

- improved substantially
- improved somewhat
- remained about the same
- worsened somewhat
- worsened substantially
- don't know

Question 2 *What is your perception on how consumer prices evolved during the last 12 months?*

They ...

- increased substantially
- increased somewhat
- increased slightly
- remained about the same
- decreased
- don't know

Question 3 *How will consumer prices evolve during the next 12 months compared to the previous 12 months?*

They will ...

- increase more
- increase the same
- increase less
- stay the same
- decrease
- don't know

Question 4 *How did the financial situation of your household evolve during the past 12 months?*

It ...

- improved substantially
- improved somewhat
- remained about the same
- worsened somewhat
- worsened substantially
- don't know

Question 5 *How will the financial situation of your household evolve during the next 12 months?*

It will ...

- improve substantially
- improve somewhat
- remain the same
- worsen slightly
- worsen substantially
- don't know

Question 6 *How will the generell economic situation in Germany evolve during the next 12 months?*

It will ...

- improve substantially
- improve slightly
- remain the same
- worsen slightly
- worsen substantially
- don't know

Question 7 *What is the current financial situation of your household?*

- we save a lot
- we save a bit
- we just manage to live from our financial inflows and don't save
- we have to de-save
- we become indebted
- don't know

Question 8 *Given the current economic situation, do you think it's a good time to buy larger items such as furniture, electronic items etc?*

- yes, it's a good time
- the time is neither good nor bad
- no, it's a bad time
- don't know

Question 10 *What is your expectation regarding the number of unemployed people in Germany in the next 12 months?*

It will ...

- increase substantially
- increase somewhat
- remain the same
- decrease somewhat
- decrease a lot
- don't know

Question 11 *Do you plan to spend more money during the next 12 months on larger items such as furniture, electronics, etc compared to the previous 12 months?*

I will ...

- spend substantially more
- spend somewhat more
- spend about the same
- spend somewhat less
- spend substantially less
- don't know

Question 12 *How likely is it that you will save money during the next 12 months?*

- very likely
- quite likely
- unlikely
- very unlikely
- don't know

Question 13 *Given the current economic situation, do you think it's a good time to save right now?*

- yes, it's a good time
- probably yes
- not really
- not at all
- don't know

II Data

When conducting the survey, GfK also collects a rich set of demographics. We enlist the variables below, and report the possible values the variables obtained in the sample in parentheses.

Sex (male; female), age (continuous), household size (1; 2; 3; 4; 5 and more), city size (0$\leqslant$size$\leqslant$1,999; 2,000$\leqslant$size$\leqslant$2,999; 3,000$\leqslant$size$\leqslant$4,999; 5,000$\leqslant$size$\leqslant$9,999; 10,000$\leqslant$size$\leqslant$19,999; 20,000$\leqslant$size$\leqslant$49,999; 50,000$\leqslant$size$\leqslant$99,999; 100,000$\leqslant$size$\leqslant$199,999; 200,000$\leqslant$size$\leqslant$499,999; 500,000$\leqslant$size), marital status (single; couple; married; widowed; divorced; separated), children at home (yes; no), number of children (1; 2; 3; 4 and more), homeownership (house owner; apartment owner, renter); household

head (yes; no), education (Hauptschule; Realschule; Gymnasium; University), employment (full-time; part-time; not employed); state (Schleswig-Holstein; Hamburg; Bremen; Berlin(West); Niedersachen; Nordrhein-Westfalen; Hessen; Rheinland-Pfalz; Saarland; Baden-Wuerttemberg; Bayern; Mecklenburg-Vorpommern; Sachsen-Anhalt; Brandenburg; Thueringen; Sachsen; Berlin(Ost)), monthly net income (inc) (inc$\leqslant$500; 500<inc$\leqslant$750; 750<inc$\leqslant$1,000; 1,000<inc$\leqslant$1,2500; 1,2500<inc$\leqslant$1,500; 1,500<inc$\leqslant$2,000; 2,000<inc$\leqslant$2,500; 2,500<inc$\leqslant$3,000; 3,000<inc$\leqslant$3,500; 3,500<inc$\leqslant$4,000; 4,000<inc), job (farmer; liberal profession; self-employed; civil servant; white-collar worker; blue-collar worker; student; trainee, draftee; housewife; retiree; unemployed).

Data on the consumer price index, the unemployment rate, real durable consumption expenditure, real GDP, and industrial production are from the German Statistical Office (DeStatis); data on the European and German uncertainty index are from Baker et al. (2014); data on DAX and Volatility DAX are from the Deutsche Boerse; and oil price data are from Bloomberg.

We obtain the harmonized consumer price indexes (CPI) from the Statistical Data Warehouse at the European Central Bank. The data ID for the harmonized overall CPI is ICP.M.DE.N.000000.4.INX, for the all items CPI excluding food and energy it is ICP.M.DE.N.XEF000.4.INX, for the major durables CPI it is ICP.M.DE.N.0921_2.4.INX, and for the non-durable households goods CPI it is ICP.M.DE.N.056100.4.INX.

Consensus forecasts of the one-year ahead the German consumer price inflation rate in percent at an annual rate are from Consensus Economics. The company surveys over 250 financial and economic professional forecasters for different macroeconomic variables such as future growth, inflation, interest rates, and exchange rates.

The ZEW Financial Market Experts Inflation Forecast Index is from the Center of European Economic Research (ZEW). ZEW Financial Market Survey is a monthly survey among 350 financial analysts and institutional investors in Germany. The survey asks participants about their six-month expectations concerning the economy, inflation rates, interest rates, stock markets, and exchange rates in Germany and other countries. The index is the difference between the fraction of surveyed financial experts which expect inflation to increase over the next six months minus the fraction of surveyed financial experts which expect inflation to decrease in percent.

The ECB Survey of Professional Forecasters (SPF) is a quarterly survey of

expectations for the rates of inflation, real GDP growth, and unemployment in the euro area for several horizons. The participants to the Survey of Professional Forecasters are experts affiliated with financial or non-financial institutions based within the European Union.

III Press Clippings

We briefly cite a few media quotes following the announcement of the newly-elected administration in 2005 to increase VAT by 3%.

"Mehrwertsteuer ist glatter Betrug an den Waehler". Gruenen-Vorsitzende Claudia Roth haelt den Koalitionsvertrag fuer unsozial
"VAT is electoral fraud". Green party leader Claudia Roth calls coalition agreement antisocial

Berliner Morgenpost, 11/21/2005

Opposition kritisiert"Wahlbetrug". Vor allem hoehere Mehrwertsteuer stoesst auf Protest
Opposition criticizes "electoral fraud". Especially higher VAT fiercely criticized

Frankfurter Rundschau, 11/14/2005

Opposition spricht von Wahlbetrug
Opposition stresses "electoral fraud"

Die Welt, 11/13/2005

Die dreissten Steuerluegen
Unapologetic tax lies

Berliner Morgenpost, 5/19/2006

Westerwelle geisselt Steuererhoehungen
Westerwelle criticizes tax hike

Sueddeutsche Zeitung, 5/15/2006

Warum luegen Politiker?
Why do politician lie?

Welt am Sonntag, 5/14/2006

IV Additional Results

This section reports additional tests and robustness checks.

Table A.1 studies the effect of households' expectations and perceptions regarding their own personal situation. Columns (1) to (4) split the sample based on the median perception of households on how their financial situation evolved in the previous twelve months. Columns (5) to (8) split the sample based on the median expectations by households on how their financial situation will evolve in the next twelve months. The probability to respond that it is a good time to purchase durables is about 8% higher for households which expect inflation to increase compared to households which expect constant or decreasing inflation across specifications (columns (2), (4), (6), and (8)). Only households with a negative perception regarding their financial situation or with a negative outlook are more likely to have a higher probability to respond that it is a bad time to purchase durables when they expect inflation to increase (compare columns (3) and (7) to columns (1) and (5)).

Table A.2 and Table A.3 show that the definition of cutoff in the multinomial logit models in which we condition on expectation does not matter. In Table 4 and Table A.1, we assign households with median values to the set of households with negative outlook. In Table A.2 and Table A.3, we assign households with median values to the set of households with positive outlook. Results are consistent across these alternative splits.

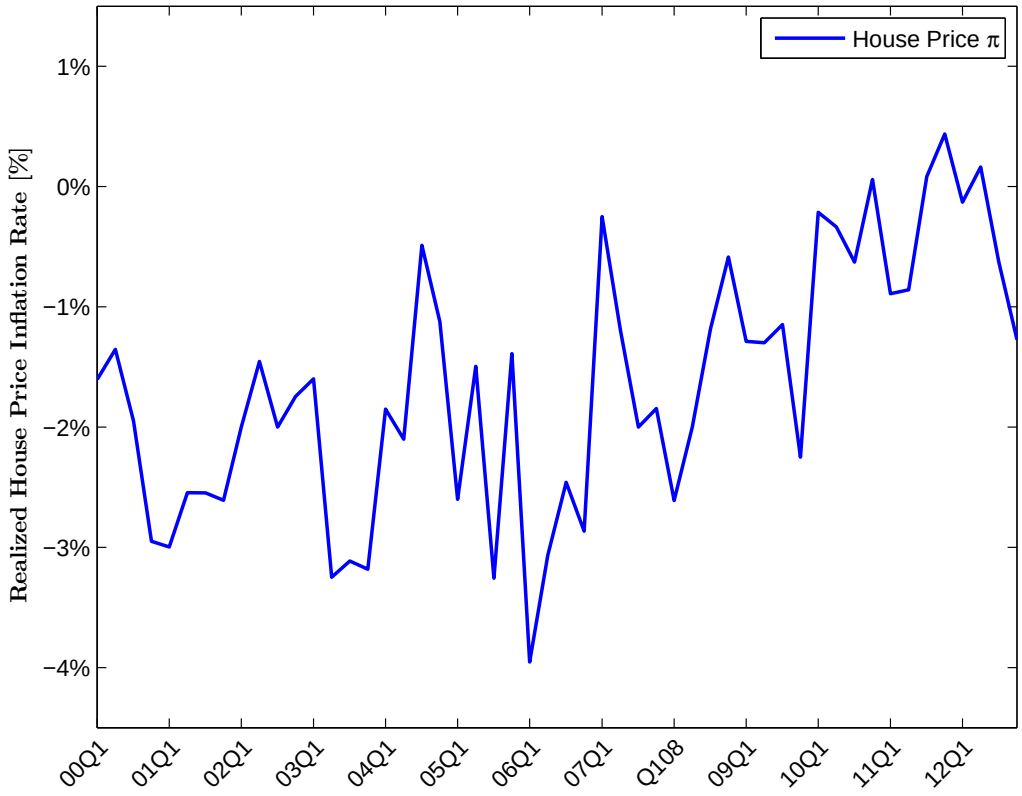
In columns (1) and (2) of Table A.4, we add dummies for past inflation instead of a categorical variable. This choice has no impact on the marginal effects of interest. In columns (3) and (4), we add a set of dummies for all the elicited answers on inflation expectations instead of our single dummy for an expected inflation increase. The average marginal effect of "prices will increase more" rises to 10.5% (column (4)). Households that expect prices to rise more in the next twelve months compared to the previous twelve months are also on average 3% less likely to say that it is a bad time to purchase durables. A linear probability model estimates consistent marginal effects (column (5)).

Months and years dummies to control for seasonality and aggregate effects and shocks have little impact on our findings (see columns (1) to (4) of Table A.5). We might also interpret the answers to the survey questions as ordered options and estimate an ordered probit model. Even in this case, we estimate marginal effects in line with our baseline estimates (see columns (4) and (5) of Table A.5). In columns (7) and (8), we

report marginal effects for a specification that only includes the inflation increase dummy, households' demographics, and expectations. Results are consistent with our baseline estimates.

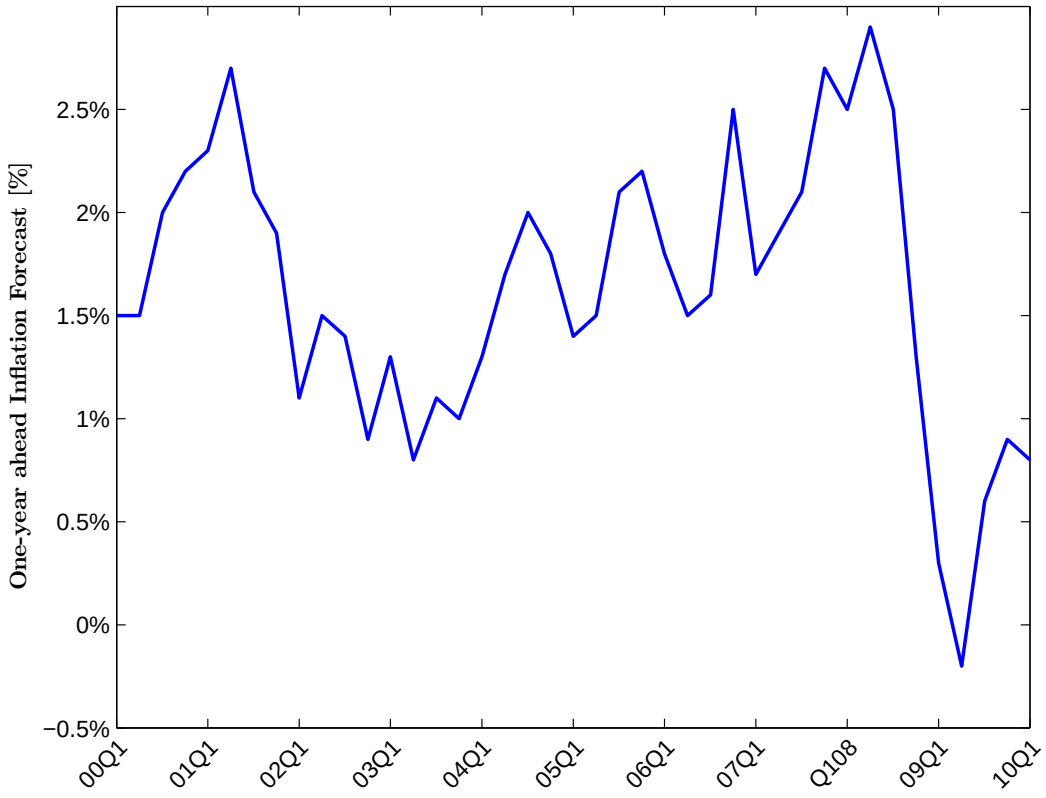
Households that expect inflation to increase are also more likely to answer that it is a bad time to save (see Table A.6).

Figure A.1: **Residential Property Price Inflation Rate**



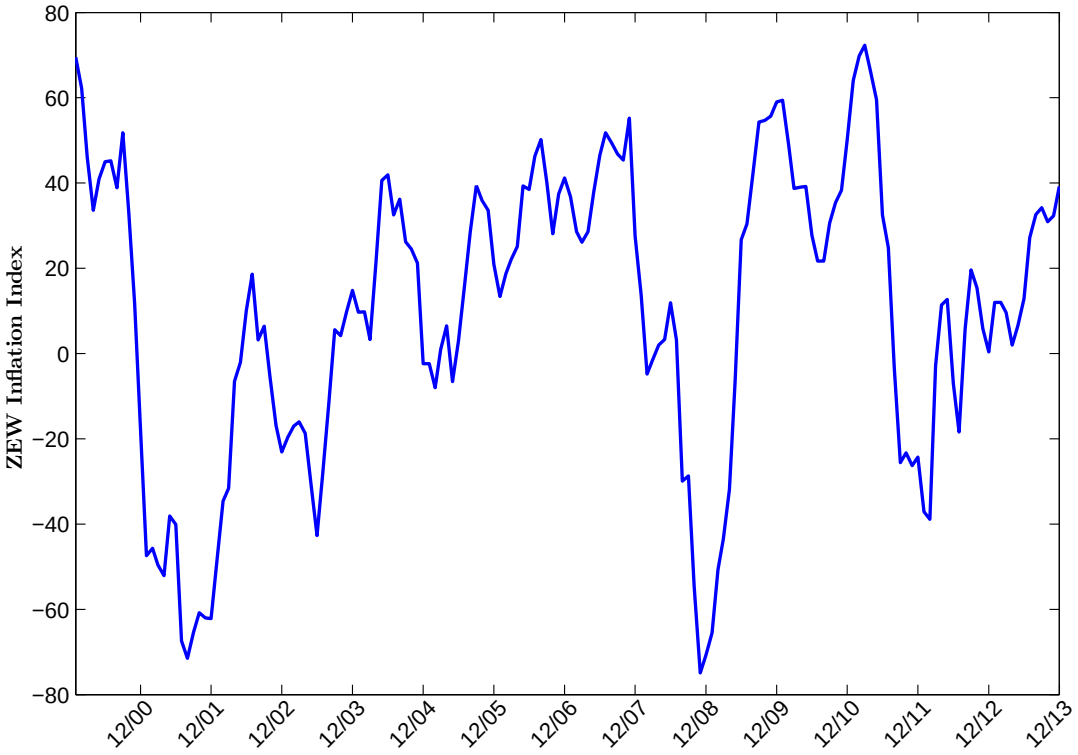
This figure plots the monthly time series of the German residential property price inflation rate in percent at an annual rate. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure A.2: **Consensus Economics One-Year Ahead Inflation Forecast**



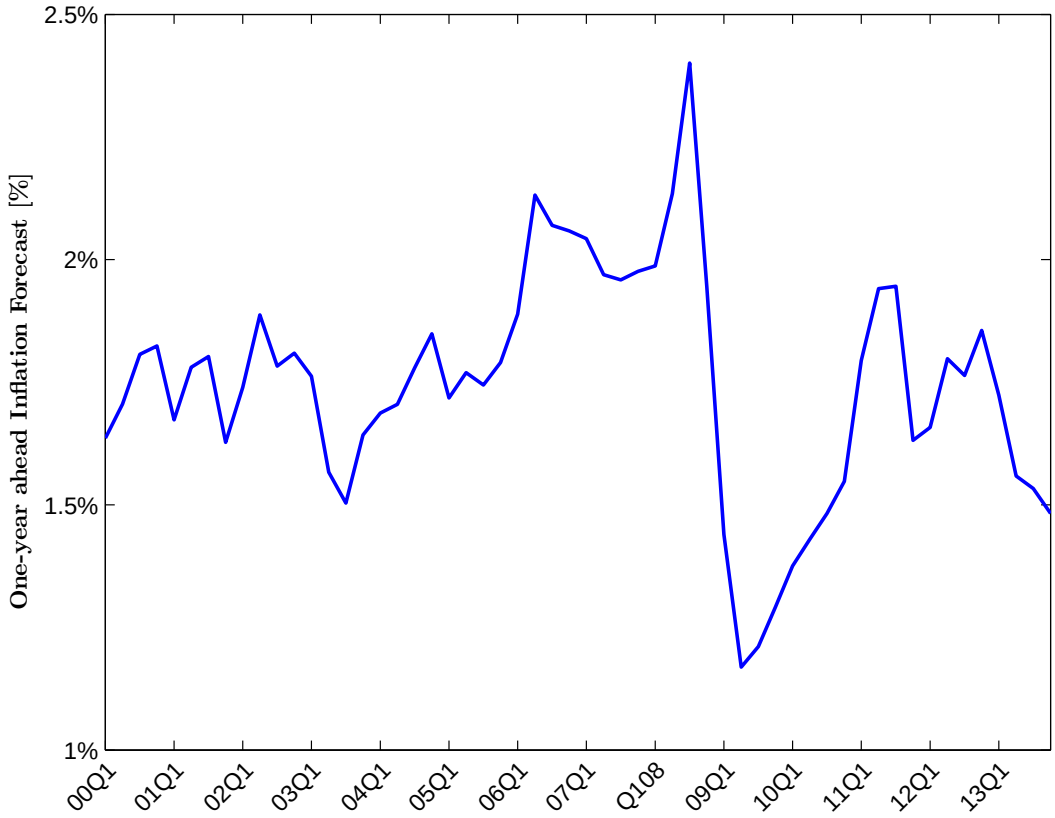
This figure plots the quarterly consensus forecasts of the one-year ahead German consumer price inflation rate in percent at an annual rate as surveyed by Consensus Economics. The sample period is first quarter 2000 to forth quarter 2013 for a total of fourteen years.

Figure A.3: **ZEW Financial Market Experts Inflation Forecast Index**



This figure plots the monthly time series of the ZEW inflation index for the German CPI inflation rate. The index is the difference between the fraction of surveyed financial experts who expect inflation to increase over the next six month minus the fraction of surveyed financial experts who expect inflation to decrease in percent. The sample period is January 2000 to December 2013 for a total of fourteen years.

Figure A.4: **Survey of Professional Forecasters One-Year ahead Inflation Forecast (Eurozone)**



This figure plots the quarterly time series of the average one-year ahead forecasts by professional forecasters for the harmonized consumer price inflation in the Eurozone in percent at an annual rate. The sample period is first quarter 2000 to forth quarter 2013 for a total of fourteen years.

Figure A.5: **2005 SPD Election Poster**

This figure plots a SPD election poster of the 2005 electoral campaign.

Table A.1: **Inflation Expectations and Readiness to Spend: Idiosyncratic Expectations**

This table reports the average marginal effects of a multinomial logit regression for different subsets of households. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) to (4) split the sample based on the median perception of households' financial situation over the last twelve months. Columns (5) to (8) split the sample based on the median expectation of households' financial situation over the next twelve months.

	Positive financial perception		Negative financial perception		Positive financial expectation		Negative financial expectation	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0009	0.0829***	0.0276***	0.0718***	0.0026	0.0745***	0.0261***	0.0747***
	(0.0081)	(0.0153)	(0.0095)	(0.0155)	(0.0099)	(0.0128)	(0.0095)	(0.0159)
Past Inflation	0.0351***	−0.0362***	0.0664***	−0.0326***	0.0588***	−0.0397***	0.0639***	−0.0332***
	(0.0034)	(0.0039)	(0.0049)	(0.0027)	(0.0060)	(0.0039)	(0.0046)	(0.0028)
Pseudo R^2	0.0082		0.0173		0.013		0.0168	
Nobs	45085		276,411		49,580		271,916	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.2: **Inflation Expectations and Readiness to Spend: Individual Expectations (different cutoff)**

This table reports the average marginal effects of a multinomial logit regression for different subsets of households. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. We assign median observations to the positive expectation sample. Columns (1) to (4) split the sample based on the median GDP growth expectations over the next twelve months. Columns (5) to (8) split the sample based on the median unemployment expectations over the next twelve months.

	Higher growth outlook		Lower growth outlook		Lower unemployment outlook		Higher unemployment outlook	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0068	0.0953***	0.02	0.0609***	−0.0046	0.0879***	0.0283***	0.0671***
	(0.0088)	(0.0161)	(0.0122)	(0.0138)	(0.0096)	(0.0204)	(0.0091)	(0.0114)
Past Inflation	0.0453***	−0.0250***	0.0721***	−0.0414***	0.0426***	−0.0221***	0.0739***	−0.0435***
	(0.0047)	(0.0030)	(0.0048)	(0.0035)	(0.0042)	(0.0030)	(0.0050)	(0.0035)
Pseudo R^2	0.0108		0.0178		0.0098		0.0198	
Nobs	211,499		109,997		169,273		152,223	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.3: **Inflation Expectations and Readiness to Spend: Idiosyncratic Expectations (different cutoff)**

This table reports the average marginal effects of a multinomial logit regression for different subsets of households. Households' readiness to purchase durables is the independent variable. Inflation increase is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. We assign median observations to the positive expectation sample. Columns (1) to (4) split the sample based on the median perception of households' financial situation over the last twelve months. Column (5) to (8) split the sample based on the median expectation of households' financial situation over the next twelve months.

	Positive financial perception		Negative financial perception		Positive financial expectation		Negative financial expectation	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	0.0066	0.0880***	0.0328**	0.0498***	−0.0013	0.0841***	0.0138	0.0624***
	(0.0073)	(0.0156)	(0.0144)	(0.0145)	(0.0075)	(0.0141)	(0.0184)	(0.0193)
Past Inflation	0.0360***	−0.0256***	0.0737***	−0.0362***	0.0504***	−0.0301***	0.0767***	−0.0401***
	(0.0029)	(0.0029)	(0.0049)	(0.0034)	(0.0044)	(0.0028)	(0.0052)	(0.0042)
Pseudo R^2	0.0087		0.0162		0.0121		0.0179	
Nobs	237,784		83,712		274,444		47,052	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.4: **Inflation Expectations and Readiness to Spend: Inflation dummies and OLS**

This table reports the average marginal effects of a multinomial logit regression for different time periods. Households' readiness to purchase durables is the independent variable. Inflation expectation is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) add dummy variables for past inflation, columns (3) and (4) add dummy variables for inflation expectations, and column (5) estimates an OLS specification.

	Past inflation dummies		Inflation expectation dummies		OLS
	Bad time	Good time	Bad time	Good time	
	(1)	(2)	(3)	(4)	(5)
Inflation increase	−0.0072	0.0874***			0.0988***
	(0.0081)	(0.0161)			(0.0272)
Prices will increase less			−0.0167***	0.0234***	
			(0.0047)	(0.0061)	
Prices will increase the same			−0.0295***	0.0202***	
			(0.0060)	(0.0073)	
Prices will increase more			−0.0292***	0.1048***	
			(0.0109)	(0.0193)	
Past Inflation			0.0419***	−0.0237***	−0.0598***
			(0.0034)	(0.0034)	(0.0061)
Prices stayed constant	−0.0164	−0.1497***			
	(0.0140)	(0.0115)			
Prices increased slightly	−0.0039	−0.1574***			
	(0.0164)	(0.0129)			
Prices increased somewhat	0.0164	−0.1585***			
	(0.0172)	(0.0136)			
Prices increased substantially	0.0919***	−0.1953***			
	(0.0184)	(0.0143)			
Demographics	X	X	X	X	X
Individual expectations	X	X	X	X	X
Pseudo R^2	0.0676		0.0657		0.1056
Nobs	219,799		215,579		219,799

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.5: **Inflation Expectations and Readiness to Spend: month & year dummies and ordered probit**

This table reports the average marginal effects of multinomial logit and ordered probit regressions for different time periods. Households' readiness to purchase durables is the independent variable. Inflation expectation is a dummy variable which equals 1 when a household replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is a bad time, or it is neither a good time nor a bad time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years. Columns (1) and (2) restrict the sample to 2006 to study the effect of the unexpected VAT increase in 2007, columns (3) and (4) exclude 2006, and columns (5) and (6) restrict the sample to 2010 to 2012 to study the effect of the European sovereign debt crisis.

	Month dummies		Year dummies		Ordered probit		No past inflation	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation increase	−0.0074	0.0878***	0.0139***	0.0719***	−0.0504***	0.0479***	0.0048	0.0827***
	(0.0081)	(0.0151)	(0.0051)	(0.0070)	(0.0137)	(0.0139)	(0.0095)	(0.0167)
Past Inflation	0.0376***	−0.0200***	0.0309***	−0.0096***	0.0307***	−0.0291***		
	(0.0033)	(0.0035)	(0.0015)	(0.0026)	(0.0033)	(0.0029)		
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0657		0.0819		0.0564		0.0603	
Nobs	219,799		219,799		219,799		221,392	

Standard errors in parentheses

$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.6: **Inflation Expectations and Readiness to Save**

This table reports the average marginal effects of a multinomial logit regression. Households' readiness to save is the independent variable. Inflation expectation is a dummy variable which equals 1 when a households replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a monthly basis whether it is a good time to purchase durables given the current economic conditions. Households can reply that it is a good time, it is probably a good time, it is not really a good time, or it is not at all a good time. Standard errors are clustered at the quarter level. The sample period is January 2000 to December 2013 for a total of fourteen years.

	Not at all	Not really	Good time
	(1)	(2)	(3)
Inflation increase	0.0160***	0.0082**	0.0006
	(0.0016)	(0.0036)	(0.0082)
Past Inflation	0.0019**	−0.0134***	0.0332***
	(0.0007)	(0.0023)	(0.0045)
Pseudo R^2		0.0203	
Nobs		234,522	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.7: **Inflation Expectations and Readiness to Spend: Durable Sub-categories**

This table reports the average marginal effects of a multinomial logit regression for different city sizes. Households spending more on different durables in the next twelve months compared to the previous twelve months is the independent variable. Inflation increase is a dummy variable which equals 1 when a households replies that inflation will increase. Past inflation measures the household perception of the increase in consumer prices during the last twelve months. We also control for household demographics and household expectations. We use the confidential micro data underlying the GfK Consumer Climate MAXX survey to construct these variables. GfK asks a representative sample of 2,000 households on a quarterly basis whether households want to spend more on certain goods in the next twelve months compared to the previous twelve months. Households can reply that they want to spend more, the same, or less. Standard errors are clustered at the quarter level. The sample period is first quarter 2000 to fourth quarter 2013 for a total of fourteen years. Columns (1) and (2) study the propensity to buy cars, columns (3) and (4) study the propensity to renovate, columns (5) and (6) study the propensity to buy household appliances, and columns (7) and (8) study the propensity to purchase furniture.

	Car		Renovate		Appliances		Furniture	
	Bad time	Good time	Bad time	Good time	Bad time	Good time	Bad time	Good time
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflation Increase	−0.0012	0.0265***	−0.0177***	0.0234***	−0.0134**	0.0185***	−0.0245***	0.0179***
	(0.0061)	(0.0031)	(0.0061)	(0.0044)	(0.0058)	(0.0024)	(0.0061)	(0.0033)
Past Inflation	0.0055*	0.0040**	0.0116***	0.0088***	0.0232***	−0.0012	0.0227***	0.0026*
	(0.0033)	(0.0016)	(0.0032)	(0.0021)	(0.0027)	(0.0008)	(0.0028)	(0.0015)
Demographics	X	X	X	X	X	X	X	X
Individual expectations	X	X	X	X	X	X	X	X
Pseudo R^2	0.0393		0.0225		0.0377		0.0378	
Nobs	59,011		57,655		71,699		69,013	

Standard errors in parentheses
$*p < 0.10, **p < 0.05, ***p < 0.01$

Table A.8: **German Tax-to-GDP Ratio Over Time**

This table reports the total tax- and VAT-tax-to-GDP ratios in columns (1) and (2) and nominal GDP for Germany for a sample form 2000 to 2014 from the OECD revenue statistics. Columns (3) and (4) calculate the implied total taxes and VAT taxes. Column (5) calculates the hypothetical total tax under the assumption that the VAT-to-GDP ratio for the years 2007 to 2013 equals the average VAT-to-GDP ratio for the years 2000 to 2006. Column (6) calculates the hypothetical total tax-to-GDP ratio using the total taxes from column (5).

Year	Tax to GDP (1)	VAT to GDP (2)	GDP (3)	Total Tax (4)	VAT (5)	Total Tax w/o VAT increase (6)	Tax to GDP w/o VAT increase (7)
2000	36.30%	6.70%	2,113,500	767,201	141605	767,201	36.30%
2001	35.10%	6.40%	2,176,810	764,060	139316	764,060	35.10%
2002	34.40%	6.20%	2,206,280	758,960	136789	758,960	34.40%
2003	34.70%	6.20%	2,217,050	769,316	137457	769,316	34.70%
2004	33.90%	6.10%	2,267,580	768,710	138322	768,710	33.90%
2005	33.90%	6.10%	2,297,820	778,961	140167	778,961	33.90%
2006	34.50%	6.20%	2,390,200	824,619	148192	824,619	34.50%
2007	34.90%	6.80%	2,510,110	876,028	170688	862,761	34.37%
2008	35.30%	6.90%	2,558,020	902,981	176503	886,902	34.67%
2009	36.10%	7.20%	2,456,660	886,854	176880	864,042	35.17%
2010	35.00%	7.00%	2,576,220	901,677	180335	882,907	34.27%
2011	35.70%	7.00%	2,699,100	963,579	188937	943,914	34.97%
2012	36.50%	7.10%	2,749,900	1,003,714	195243	980,929	35.67%
2013	36.70%	7.00%	2,809,480	1,031,079	196664	1,010,610	35.97%