# Traditional Gender Roles and the Gender Expectations Gap*

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**Abstract**

Expectations about important economic variables, such as inflation, vary dramatically across genders, even within households and despite the lack of gender connotation in economic variables. We conjecture that traditional gender roles make women and men face different economic signals in their daily lives, which in turn produce systematic variation in expectations which we label the gender expectations gap. Using unique data on the distribution of shopping duties within US married couples, exposure to price signals through grocery shopping, and individual inflation expectations, we provide evidence consistent with this mechanism. We discuss how this distortion might spill over to other expectations and to economic choices.

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**Keywords: Gender Gap, Perception, Cognition, Expectations, Inequality.**

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# I Introduction

Beliefs about the future shape human choices and decisions, and they often differ systematically across genders. On average, women tend to hold significantly more distorted beliefs, relative to men, about key economic variables, ranging from consumer-price and house-price inflation to expectations about stock prices, medical and schooling expenses, and their own financial situation.[1]

For the case of consumer inflation, both men and women have upward-biased expectations compared to ex-post outcomes but women's upward bias is systematically larger. We label this phenomenon the "gender expectations gap." The gender expectations gap can have detrimental consequences for women's economic choices and long-term wealth, as well as hamper the effectiveness of economic policies that aim to manage households' expectations in times of crisis (D'Acunto et al. (2019b)). Earlier research also shows that distorted beliefs about economic variables induce stress and affect women's happiness and well-being (Di Tella et al. (2001)). Yet, existing research provides little explanation for the root of the stark gender differences in beliefs.

In this paper, we assess the role of traditional gender roles as a determinant of the gender expectations gap. Gender roles induce women and men to engage in different activities and to select into different environments in their daily lives. As a result, they have different experiences and are exposed to different signals about the economy, which in turn leads to differences in economic perceptions and expectations (Lucas (1972)).

Our analysis focuses on the role of grocery shopping and exposure to grocery prices. Complying with traditional gender roles, women still undertake the majority of grocery shopping for their households,[2] which exposes them to grocery-price changes more frequently than men. Grocery-price inflation, in turn, is highly volatile—so much so that the Federal Reserve focuses on the Core consumer price index, which excludes food (and energy), to more reliably identify inflation trends (Evans and Fisher (2011)). Based on

[1] For instance, see Bjuggren and Elert (2019); Jacobsen et al. (2014); Armantier et al. (2013); Bruine de Bruin et al. (2010).

[2] See Pew Research Center (2019) analysis of the 2014-2016 BLS American Time Use Survey available here: https://www.pewresearch.org/fact-tank/2019/09/24/among-u-s-couples-women-do-more-cooking-and-grocery-shopping-than-men/ft_19-08-28_genderchores_1/.

Figure 1: **Gender Expectations Gap Within Households: Raw Data**




*Notes.* The left bar of Figure 1 plots the average differences in the inflation expectations of women and men within all households headed by heterosexual couples in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. The mid and right bars propose a sample split based on whether men in the household take part in grocery shopping. Error bars indicate 95% confidence intervals obtained from standard errors clustered at the household level.

prior research showing that consumers focus disproportionately on price increases rather than decreases (Cavallo et al. (2017); Ranyard et al. (2008); Bates and Gabor (1986); Tversky and Kahneman (1974)), women's exposure to volatile price changes can generate the upward bias in inflation perceptions as well as beliefs about future inflation giving rise to the gender expectations gap.

To assess the relationship between gender-specific exposure to economic signals and expectations, we construct a novel data set that combines individual-level elicitation of economic beliefs from a representative US sample with detailed information about the distribution of shopping duties and the corresponding exposure to price changes within married couples (Chicago Booth Expectations and Attitudes Survey, CBEAS). Our data also include information on the frequency of grocery shopping of each spouse.[3]

The raw data confirm that women have systematically higher inflation expectations

[3]Following our paper, other researchers have started to elicit individual inflation expectations in the KNCP through customized surveys (see, e.g., Coibion et al. (2019) and Coibion et al. (2019)).

than men. The left bar of Figure 1 documents an average difference in the numerical expectations for 12-month ahead inflation between the female and the male head of US heterosexual couples that is positive and economically and statistically significant. Our data are the first to establish the gender expectations gap *within* households.

The middle and right bars reveal a novel fact, which is the focus of our analysis: The gender expectations gap varies substantially based on which spouse engages in grocery shopping. When considering separately households in which men do not partake in grocery chores (middle bar) and those in which men contribute at least in part (right bar), we see the first group fully drives the gender gap in inflation expectations. For households in which the grocery shopping duties are shared more equally among spouses, we fail to detect any economically or statistically significant gender gap in inflation expectations.

To appreciate the economic magnitude of this gender expectations gap, note that the the US Federal Reserve's inflation target is 2%—the gender expectations gap suggest women have an upward bias relative to men that corresponds to 25% of the inflation target. Based on the Fisher equation, such bias implies that women might perceive lower real interest rates than men for each level of nominal interest rates. Perceptions of real interest rates are important, because they drive individual saving and borrowing choices. In times of 1.5% nominal rates, which the US economy has experienced over the last few years, women would perceive real rates that are 33% lower than those men perceive.

Our multivariate analysis shows that the difference between households with and without male participation in grocery chores is a robust feature of the data. The gender gap does not relate to differences in risk preferences, numeracy, or financial literacy within households, which Lusardi and Mitchell (2008) and Niederle (2015) have documented as important determinant of expectations. The results do not change when we partial out income, education levels, and other demographics, such as unemployment status or ethnicity, which influence uncertainty in individual inflation expectations.

To support our proposed mechanism, we show that no gender difference exists once we restrict the analysis to grocery shoppers, which is direct evidence that systematic differences across genders unrelated to grocery shopping cannot drive the results. We also verify that men and women have a similar mapping between signals about prices—their

perception about current inflation—and inflation expectations, once we keep perceptions constant, which rules out that unobserved characteristics make men and women process information about inflation or form inflation expectations differently.

We then ask whether traditional gender norms affect expectations other than inflation. For this analysis, we move to the *New York Fed Survey of Consumer Expectations* (SCE), which contains information on gender, preferences, a rich set of demographics and expectations regarding inflation, house prices, medical expenses, the stock market, and the government deficit. The SCE however does not contain information on grocery shopping and does not interview individuals from within the same household.

We first corroborate the external validity of the results in the CBEAS. We confirm the gender expectations gap in the SCE over both a short-term and long-term horizon. We then show that women have more pessimistic expectations about several economic variables: They are less likely to expect positive stock returns, they expect higher house-price inflation, they are more pessimistic about the stock of US government debt, and they perceive their own financial situation as worse relative to men.

We utilize the SCE to provide further evidence for the relevance of gender roles by identifying subsamples in which traditional gender roles tend to be less stark. The first subsample are respondents from areas where a high share of men does at least some grocery shopping for their households. The second subsample are respondents below 25 years of age, among whom the perception of traditional gender norms has become less stark (Glaeser and Ma (2013), D'Acunto (2018)). In these two subsamples, the gender expectations gap is indeed lower for any type of inflation measure. Moreover, we find that the volatility and uncertainty of economic expectations are higher among women, which is consistent with women being exposed to volatile signals about prices such as grocery prices that change frequently.

Overall, our results support the conjecture that seemingly innocuous differences in women's and men's daily environments can have significant consequences for their beliefs about key economic variables. That is, traditional gender roles shape beliefs not only in contexts that have been singled out as being "gendered," such as beliefs about the ability of women to perform in STEM disciplines or in leadership roles. Even in realms that have

no gender connotation, such as economic expectations, differential exposure to signals in daily life due to differential gender roles can leave an imprint on women's outlook.

Our findings on the gender expectations gap as well as the underlying signal-exposure mechanism have significant implications, both at the macroeconomic and the microeconomic level. At the macro level, inflation expectations are central to the effectiveness of economic policy (Bernanke (2010)), especially as low interest rates are becoming common in most industrialized countries (Summers (2018)), because inflation inflation expectations shape perceived real interest rates and determine consumption and savings decisions through the consumer Euler equation. Systematic gender differences in belief formation might therefore hamper the effectiveness of aggregate policies that aim to stabilize the business cycle and to avoid prolonged economic crises.

On the micro level, distorted inflation expectations can be detrimental for individuals' economic outcomes. Consumers who expect higher prices might engage in excessive consumption, not accumulate enough savings for retirement, and make suboptimal real-estate investments. The gender expectations gap might adversely affect women's financial decisions and wealth accumulation, which in turn increases gender inequality in wealth. Future research should assess the extent to which the gender expectations gap contributes to explain these systematic differences in economic outcomes across genders.

Earlier research has documented that gender roles affect women's preferences, beliefs, and outcomes in several domains (Croson and Gneezy (2009); Bertrand (2011); Adams and Funk (2012)), including their choices of fields of education and skills (MossRacusin et al. (2012); Guiso et al. (2008); Dossi et al. (2019)), occupations (Eagly and Steffen (1984)), career paths (Adams and Kirchmaier (2016); Goldin and Mitchell (2017)), and investment decisions (D'Acunto (2018)). In those areas, gender roles influence both women's own actions, as they comply to a prescribed gender role (Steele (1997); Correll (2004)), and the actions of others based on gender stereotyping (Fernández et al. (2004); Skewes et al. (2018); Eagly (1987); Carli et al. (2016)).

In all these cases, gender roles affect beliefs about women's ability to conduct male-connotated tasks and outcomes that possess a gender-specific connotation. Our findings suggest that, even beyond decisions that are stereotypically gendered, seemingly

innocuous differences in women's daily exposures to prices can have significant consequences for perceptions and expectations. The evidence in our paper highlights a relationship between gender roles and non-gendered beliefs and outcomes, which is subtle and hard to reduce through traditional policy interventions.

# II Survey Data

We utilize a novel source of data, the CBEAS, which we fielded online in two waves in June 2015 and June 2016. We invited all members of the Kilts-Nielsen Consumer Panel (KNCP) to participate, approximately 40,000-60,000 households per wave. KNCP reports both static demographics, such as household size, income, ZIP code of residence, and marital status, and dynamic features of participants' grocery purchases, such as categorizations of the products purchased, information on the shopping outlets, and the per-unit price paid for each item. The prices are collected electronically through scanner-based registration by participating households.

To ensure the accuracy of the data, Nielsen organizes monthly prize drawings, provides points for its gift catalog after each scanner-data submission, and is in ongoing communication with panel households. Not surprisingly, given these incentives, the KNCP has a retention rate of more than 80%.

In the CBEAS, we elicit the numerical inflation expectations and perceptions of household members. For inflation expectations, we elicit both point estimates and distributions. We also ask respondents if they are the primary grocery shopper for their household, and we record whether the female household head is a non-retired and non-unemployed homemaker ("stay-home mum").

To test for the relationship between traditional gender roles and expectations, we limit the sample to heterosexual couples in which we observe the survey responses of both the male household head and the female household head. In these households, we compare men and women, keeping constant all household-level characteristics. This sample includes 20,866 observations of male and female household heads across both survey waves, which belong to 7,846 unique households.

Consistent with the notion that women are more likely to do the grocery shopping for the household, female heads declare that they were a grocery shopper in 5,135 households (65%), whereas male heads did so only in 908 households (12%), and another household member in the remaining 1,803 households (22%).[4]

To analyze the gender expectations gap for a longer sample period than is available through the KNCP waves, we also make use of the expectations data in the SCE. The SCE has become a key survey tool to study the effectiveness of monetary policy in the US.[5] This survey collects a broad set of economic expectations for a representative population, alongside demographic characteristics, as well as elicited mathematical and financial skills. The survey is a rotating panel in which the same respondent is interviewed every month for up to 12 months. The sample period is from June 2013 to April 2018. We restrict the sample to respondents for whom we observe both expectations and financial skills. Our working sample thus includes 40,568 individual-month observations. The number of unique individuals in the sample is 6,052, of which 49.66% are women. We define all the variables we use in the paper in Table A.1.

# III Results

We first assess the conjecture that differences in men's and women's daily exposures to price signals contribute to explain the gender expectations gap. By undertaking the majority of grocery shopping duties for their households, women are exposed to the volatile and large price changes of grocery goods more frequently than men. This exposure can induce higher inflation expectations among women, because individuals focus disproportionately more on price increases rather than decreases (see Cavallo et al. (2017); Ranyard et al. (2008); Bates and Gabor (1986); Tversky and Kahneman (1974)), and tend to map their perception of current price changes into inflation expectations (D'Acunto et al. (2019)).

As we discussed in the introduction, Figure 1 above presents the raw data of the

[4] A two-sided t-test for whether the shares of grocery shoppers are equal across genders rejects the null hypothesis at standard levels of significance ($p<0.01$).

[5] Armantier et al. (2017) provide a detailed overview of the survey design, the sample construction, and summary statistics of the SCE.

CBEAS. Women's inflation expectations are on average 0.40 percentage points higher than those of men ($p < 0.01$). This average difference, however, masks substantial heterogeneity: households in which men do not participate in grocery shopping exhibit a 0.64 pp ($p < 0.01$) gender difference in inflation expectations compared to a difference of only 0.10 pp ($p = 0.35$) in other households. A two-sided $t$-test for equality of gender differences between the two samples rejects the null at $p < 0.01$. The gender difference in inflation expectations is economically sizable: The inflation target of the Federal Reserve is 2% per year, and realized inflation was less than 2% during our survey months.

We find qualitatively similar patterns when we use an alternative proxy of traditional gender roles, namely, whether a household has a "stay-home mum" as defined previously. In the raw data, households with stay-home mums display a gender difference of 0.58 pp ($p < 0.01$), compared to 0.36 pp ($p < 0.01$) in other households (untabulated).

We take these patterns from the raw data into a multivariate setting to account for demographic variables and preferences that might affect the differences in inflation expectations across genders. We estimate a linear model regressing inflation expectations on gender and gender roles, keeping constant all demographics and individual characteristics available in our data, including age, square of age, employment status, 16 income dummies, home ownership, marital status, college dummy, four race dummies, and reported risk tolerance. In the most restrictive specification, we include household fixed effects to ensure that time-invariant heterogeneity across households does not explain our results. Additionally, we control for a set of expectations about *other* economic variables that might predict inflation expectations, including expectations about individual income, aggregate US growth, and about financial soundness. Finally, we include a proxy that controls for the possibility that women might generally be less overconfident or less certain than men, namely, the individual-level variance of inflation expectations. The higher the variance, the less confident is the respondent about the expectations of future outcomes.

Figure 2 displays the same gender differences as Figure 1, but based on the multivariate analysis. (The estimations are reported in Online-Appendix Table A.2). We estimate the same patterns as in the raw data: Women's inflation expectations are on average 0.33 p.p. (p<0.01) higher than men's (left graph). However, in households

in which men do not participate in grocery shopping, the difference amounts to 0.65 p.p. ($p<0.01$), compared to $-0.011$ p.p. ($p=0.94$) in other households (right graph).

The pooled-sample results are very similar. Online-Appendix Table A.2 reports results for specifications that use as independent variables an indicator for being female as well as an indicator that equals one if the respondent participates in grocery shopping. Across households, women exhibit 0.29 p.p. ($p<0.01$) higher inflation expectation relative to men (column 1). In addition, respondents who are the main grocery shopper for the household exhibit 0.47 p.p. ($p<0.01$) higher inflation expectations relative to other respondents (column 2).

Crucially, after controlling for grocery shopping behavior, no statistically significant gender difference in inflation expectations is detectable either economically or statistically (0.13), whereas the coefficient on grocery shopping remains largely unchanged (0.41, $p<0.01$). This finding indicates that innate (or otherwise induced) gender-specific variation can barely generate the gender difference in beliefs. All findings continue to hold, and the coefficient estimates remain similar also quantitatively, when we restrict the estimation to variation within households (columns (4)-(6)).[6]

Table A.3 in the Online Appendix provides additional evidence consistent with our mechanism from various sample splits. No gender difference exists in the subsample of households in which women do not participate in grocery shopping contrary to the large gender gap in the subsample in which women are the main grocery shopper (columns (1)-(2)). More importantly, we do not find a gender effect in the full sample either, once we condition on grocery shopping in column (3). Columns (4)-(6) qualitatively confirm these findings using the stay home mum proxy for traditional gender norms

# IV Mechanisms

Our research hypothesis posits that frequent exposure to grocery prices and its large and volatile changes biases women's beliefs about inflation. The rationale for this argument

[6]Ideally, we would also test whether the gender expectations gap flips sign in households where men are the main grocery shoppers. Unfortunately, this condition applies to less than 12% of the households in our representative sample, which precludes meaningful statistical inference.

can be broken down into two parts: First, women have higher inflation perceptions, that is, they perceive current inflation to be higher relative to men. Exposure to volatile grocery prices induces high inflation perceptions because consumers focus disproportionately on positive, rather than negative, price changes (Cavallo et al. (2017), Bates and Gabor (1986), Ranyard et al. (2008)). Second, these differences in inflation perceptions map into differences in expectations about (future) inflation.

Figure 3 provides direct evidence consistent with the first part of the mechanism. We replicate the unconditional gender gap for the *perception* of current inflation—the percentage change in consumer prices over the last twelve months. In line with the results for inflation expectations, we find that women on average perceive higher inflation than men, and this gender difference only occurs in households in which men do not participate in grocery shopping. These results again hold in the raw data (Panel A) and conditional on all observables we discussed before (Panel B).

We assess the second part of our proposed mechanism in Figure 4. Panel A of Figure 4 document a strong correlation between individuals' perception of current inflation and their expectations of future inflation. This correlation does not vary systematically across genders, which excludes than men and women might process perceptions about inflation differently when forming their expectations.

One concern is that the mapping of perceptions of current inflation to expectations of future inflation varies systematically across gender *and* grocery shopping. If so, gender-specific cognitive characteristics combined with the tendency to grocery shop might explain our results (D'Acunto et al. (2019a,b,c)). Panel B of Figure 4 plots the relationship between inflation expectations and perceptions for different subsamples by gender and by grocery shopping. We do not detect any systematic differences across the four groups. Whether we focus on men or women who do or do not go grocery shopping, we find a similar correlation between inflation perceptions and expectation.

The uniform mapping between perceived and expected inflation holds in a multivariate linear regression using as the dependent variable inflation expectations and as independent variables inflation perceptions, an indicator variable for being female, and their interaction, conditional on the same controls discussed above. Both the coefficient

on the interaction with inflation perceptions (−0.05, p=0.527) as well as the raw gender coefficient (−0.28, p=0.321) are insignificant (see Online-Appendix Table A.4). Moreover, conditional on inflation perceptions, the grocery shopping status or the interaction with inflation perceptions does not predict inflation expectations. These results suggest that exposure to grocery prices shapes individuals' perception of the prevailing inflation rate, which in turn feeds into inflation expectations and the tendency of women to be the primary grocery shopper in the household hence contributes to the gender expectations gap.

# V External Validity and Other Expectations

So far, we have focused on inflation expectations in the CBEAS, which allows us to jointly study participation in grocery chores and inflation expectations for both male and female household heads within the same household. We extend the analysis to expectations of other economic variables using the New York Fed SCE sample. The SCE elicits expectations about short- and long-term consumer price inflation, house prices, stock prices, the size of the US government debt, and individuals' own financial situations. The main drawback of the SCE for our scope is that the SCE does not provide information on household structure or on shopping duties. At the same time, the SCE covers a longer time period, more economic expectations, and allows us to condition on a rich set of measures of financial and economy literacy and numeracy.

In Figure 5, we plot expectations for all of the above-mentioned economic variables across genders. The vertical bars indicate men's and women's expectations in the full sample, and the horizontal bars indicate gender differences. The gender expectations gap exists across all expectations we consider. Women expect 55% higher short- and long-term consumer price inflation, and 38% higher house-price inflation. Turning to the stock market, a smaller fraction of women (38%) than men (46%) expect positive returns over the following 12 months. This difference in beliefs is economically large and might help explain why women stay away from stock investments, which have been historically profitable and are a major source of wealth accumulation for US households. Women also

expect the likelihood that the US government debt increases to be 25.5%, whereas men expect it to be 21%. Finally, only 12% of women, but 20% of men, perceive their financial situation to have improved over the prior 12 months.

We test whether these univariate gender differences in economic expectations continue to hold when controlling for a broad set of individual-level characteristics, including age, race, marital status, education, income, as well as numeracy and financial skills. In Online-Appendix Table A.5, we report ordinary-least-squares coefficients and standard errors clustered at the individual level. To allow comparison of the size of estimated coefficients, we standardize the outcome variables. (We report the value of one standard deviation and the median of each outcome variable below the variables names.) Across all columns, the estimation results remain unchanged and are similar to the graphical raw-data evidence.

To further probe the role of numeracy and financial literacy, we re-estimate all coefficients on the subsample of survey respondents who replied correctly to all the questions about numeracy and financial skills described in Table A.1 (Numeracy 1-2, Probability 1-3, Fin. Literacy 1-2). As shown in Online-Appendix Table A.6, the results are again similar. The gender expectations gap also persists when considering different types of consumer prices and expenses, including grocery prices, medical expenses, schooling expenses, and housing rents (see Online-Appendix Table A.7). Moreover, women exhibit not only more pessimistic expectations but also a higher volatility and uncertainty of expectations, computed as the within-individual volatility of numerical expectations as well as the tendency to round numerical expectations (Manski and Molinari (2010), Binder (2017)); see (Online-Appendix Table A.8).

To at least obtain indirect evidence on gender-role induced differences also for the SCE, we study specific subsamples that are likely to differ in their compliance with traditional gender roles. The first subsample approximates the male involvement in grocery chores based on geography using our CBEAS sample. We consider respondents from states where a high share of men does at least some grocery shopping for their households (the top 25% US states), which we label 'Man Shops.' The second subsample consists of respondents below 25 years of age ('Young'), among whom the perception of

traditional gender norms has become less stark than among older cohorts (Glaeser and Ma (2013), D'Acunto (2018)).

The horizontal bars in Figure 5 indicate the corresponding gender differences. The top bar plots the difference in expectations for the full sample ('All'). The next two bars in each graph, labeled 'Man Shops' and 'Young' show the corresponding gender differences for the first and the second subsample. Consistently, the gender expectations gap is indeed lower for any type of inflation measure, as well as for almost all variables overall, in these two subsamples for which traditional gender roles are less stark.[7]

# VI Discussion and Conclusion

Traditional gender roles expose women to different information about prices than men. This differential exposure distorts women's inflation expectations and contributes to explain the gender expectations gap. One implication of our findings is that gender roles shape beliefs not only in contexts that have been singled out as "gendered," such as beliefs about the ability to perform in STEM disciplines or in leadership roles, but also in realms that have no gender connotation, such as inflation expectations.

On the policy side, these effects of gender roles are harder to tackle than manipulations of other economic variables such as money supply, or even some of the less subtle aspects of gender roles. For example, policy interventions that have been implemented around the world include support for women in STEM disciplines (United States Congress (2017)) or gender quotas on the boards of large companies (Armstrong and Walby (2012)). However, in order to reduce the gap in economic expectations and hence improve women's economic and financial choices, women's exposure to a wider range of economic signals and environments would need to be fostered, which seems more difficult to enforce through legislation or regulation.

Another interesting angle is the recent tendency of shopping outlets to move to online retail. This development is interesting both because it individualizes shopping experiences, which might become even easier to trace, and because it might affect the ways

[7]Beliefs about future stock price changes in the subsample of respondents in US states with a higher share of men doing the groceries is the only exception to this pattern.

in which men and women are differentially exposed to price changes, inflation perceptions and expectations. Our findings imply that such technologically-induced changes in norms about shopping might affect the gender expectations gap going forward.

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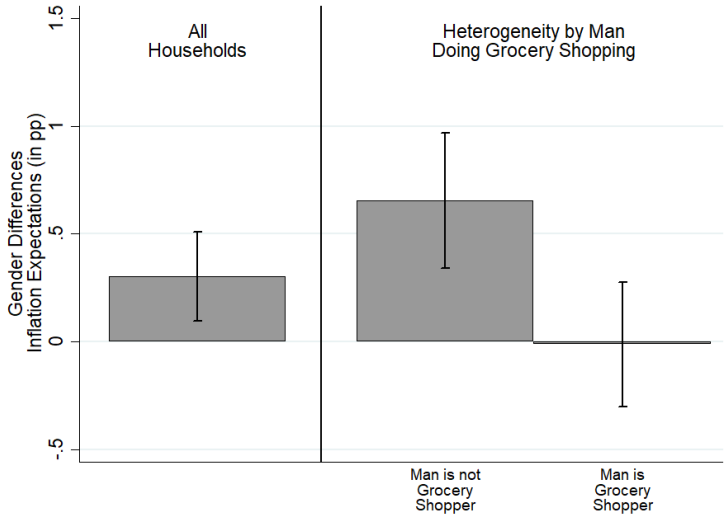
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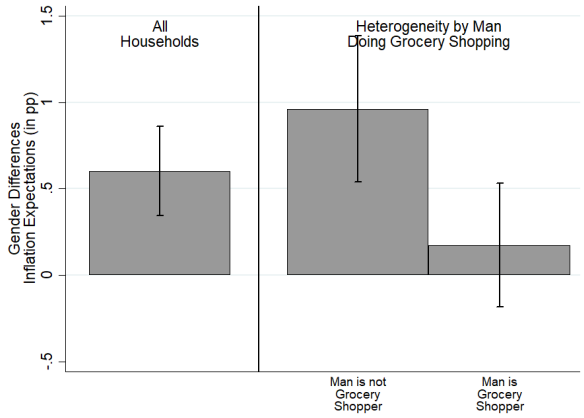
Figure 2: **Gender Expectations Gap Within Households: Residuals**



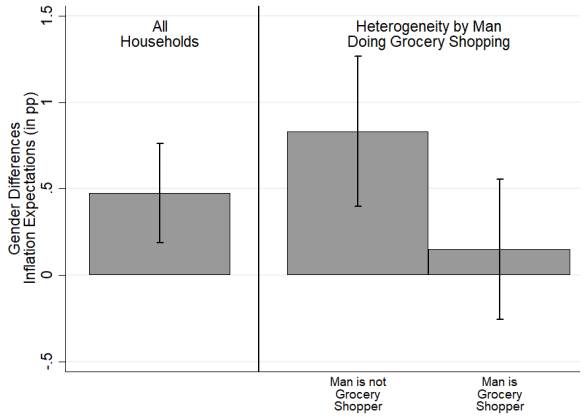

*Notes.* The leftmost bar of Figure 2 plots the average differences in the inflation expectations of women and men within all households headed by heterosexual couples in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016, conditional on controls. Control variables include age, square of age, employment status, 16 income dummies, home ownership, marital status, college dummy, four race dummies, reported risk tolerance, household fixed effects, individual income expectations, expectations for aggregate US growth, and individual expectations about financial soundness. The two bars on the right propose a sample split based on whether men in the household take part in grocery shopping. Error bars indicate 95% confidence intervals obtained from standard errors clustered at the household level.

Figure 3: **Gender Gap in Inflation Perceptions Within Households**

**Panel A**: Raw Data



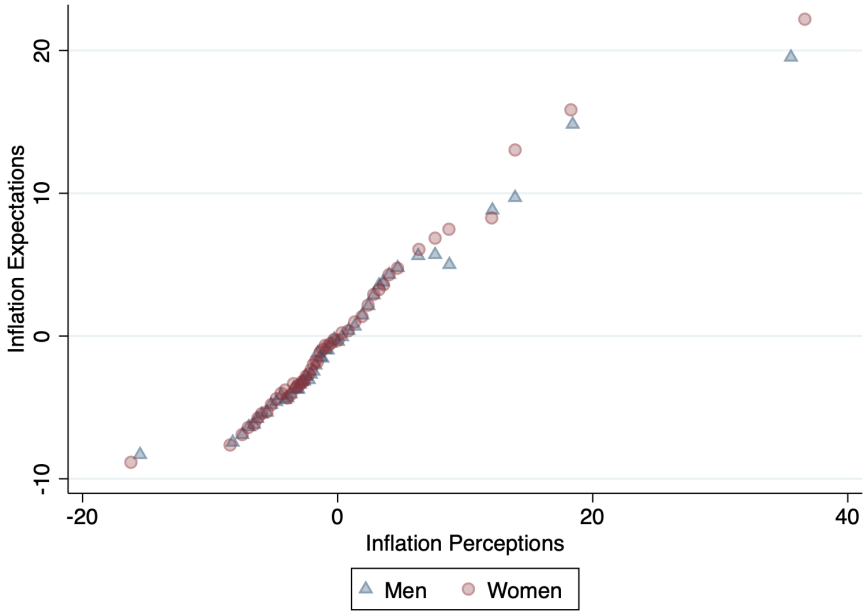

**Panel B**: Residuals



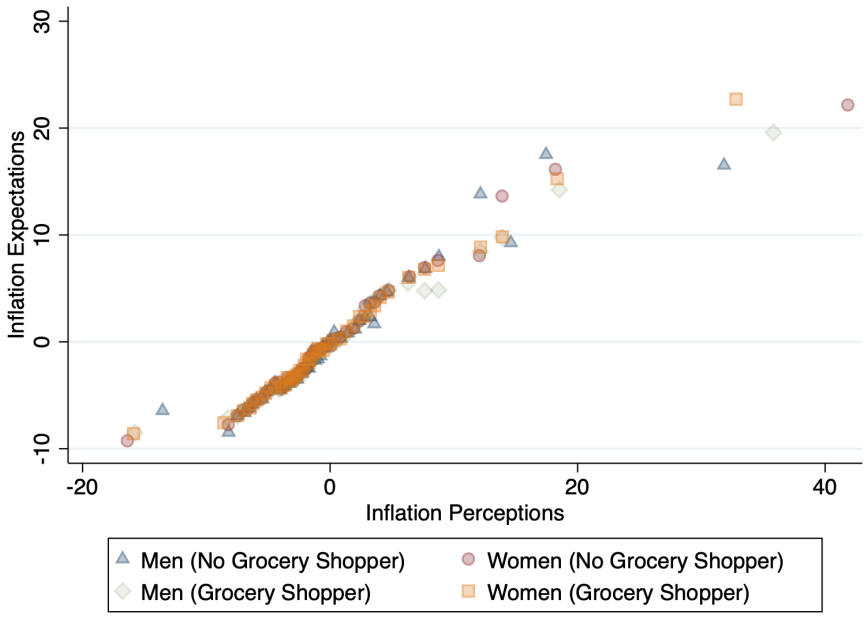

*Notes.* The leftmost bar of Figure 3 Panel A plots the average differences in the inflation perceptions of women and men for all households in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. The two bars on the right propose a sample split based on whether men in the household take part in grocery shopping. Error bars indicate 95% confidence intervals obtained from standard errors clustered at the household level. Figure 3 Panel B presents gender differences defined as above conditional on controls. Control variables include age, square of age, employment status, 16 income dummies, home ownership, marital status, household size, college dummy, four race dummies, reported risk tolerance, household fixed effects, individual income expectations, expectations for aggregate US growth, and individual expectations about financial soundness.

Figure 4: **Mapping of Perceptions into Expectations by Gender and Grocery Shopping**

**Panel A**: Unconditional

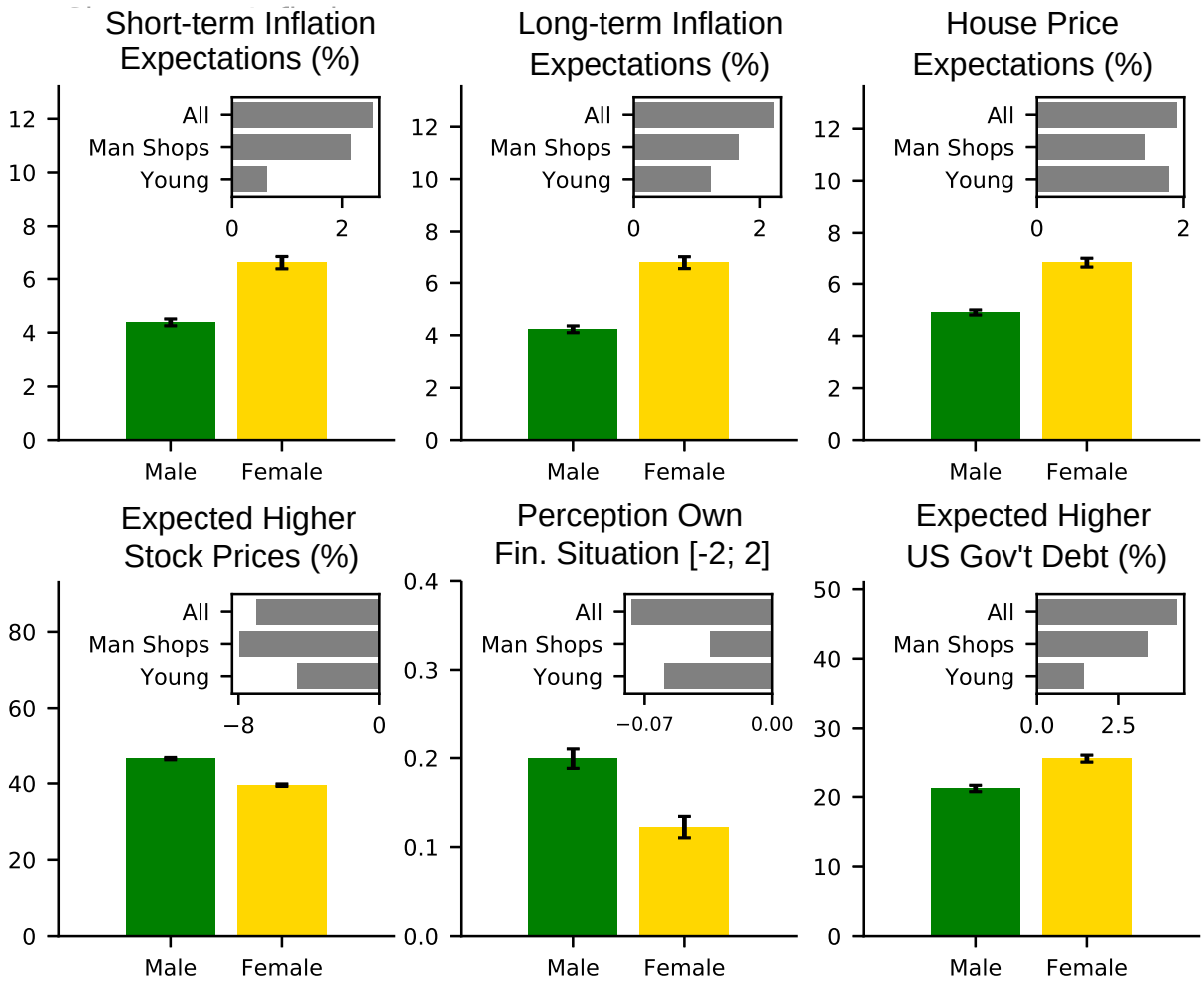



**Panel B**: Conditional on Grocery Shopping




*Notes.* Figure 4 Panel A is a binscatter plot mapping inflation perceptions into inflation expectations by gender and Panel B also conditions on grocery-shopping behavior. Inflation perceptions and expectations are based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Figure 5: **Gender and Economic Expectations**




*Notes.* The vertical bars in this figure report the estimated mean for men (green, left bar) and women (yellow, right bar) of a set of numerical expectations elicited by the *New York Fed Survey of Consumer Expectations* (see Armantier et al. (2017)). Black segments are 95% confidence intervals. Grey horizontal bars indicate the difference between the expectations of women and men for three groups: *"All"* includes the full sample; *"Man Shops"* includes only respondents in the top 25% of US states based on the share of men who are the main grocery shopper in the household, which we compute in the *Chicago Booth Expectations and Attitudes Survey*; *"Young"* includes only respondents below 25 years of age; the two latter subsamples capture groups in which gender norms might be less stark than the full sample.

# Online Appendix:

# Traditional Gender Roles and the Gender Expectations Gap

Francesco D'Acunto, Ulrike Malmendier, and Michael Weber

*Not for Publication*

Table A.1: **Variable Names, Sources, and Definitions**

| Variable Name | Source | Variable Definition |
|---|---|---|
| Inflation Expectations (ST) | NY Fed SCE and CBEAS | Respondent numerical 12-month-ahead inflation rate forecast |
| Inflation Expectations (LT) | NY Fed SCE | Respondent numerical 5-year-ahead inflation rate forecast |
| House Price Expectations | NY Fed SCE | Respondent numerical 12-month-ahead forecast for the price increase of the average home nationwide |
| Likelihood Stock Prices Increase | NY Fed SCE | Respondent numerical expectations about the percent chance that 12 months ahead on average stock prices in the US stock market will be higher than at the time of the interview |
| US Gov't Debt Expectations | NY Fed SCE | Respondent numerical expectations about the number of percentage points by which they expect the U.S. government debt to increase/decrease over the following 12 months |
| Perception Financial Situation | NY Fed SCE | Respondent's answer to the question *"Do you think you (and any family living with you) are financially better or worse off these days than you were 12 months ago?"* Five ordered categorical answers range from *"Much Worse off"* (-2) to *"Much Better off"* (2). |
| Grocery Expected Inflation | NY Fed SCE | Respondent numerical 12-month-ahead food inflation rate forecast |
| Gas Expected Inflation | NY Fed SCE | Respondent numerical 12-month-ahead gas inflation rate forecast |
| Medical Expected Inflation | NY Fed SCE | Respondent numerical 12-month-ahead medical care inflation rate forecast |
| Schooling Expected Inflation | NY Fed SCE | Respondent numerical 12-month-ahead college-expense inflation rate forecast |
| Rent Inflation Expectations | NY Fed SCE | Respondent numerical 12-month-ahead average house rent inflation rate forecast |
| Female | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is female, zero otherwise |
| Age | NY Fed SCE and CBEAS | Respondent age |

*continued on next page*

Table A.1: **Variable Definitions** (*cont.*)

| Variable Name | Source | Variable Definition |
|---|---|---|
| Hispanic | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is Hispanic |
| Black | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is African American |
| Asian | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is Asian |
| Some College | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent has some college education but did not earn a college degree |
| College Degree | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent earned a college degree |
| Post-graduate Degree | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent earned a post-graduate degree |
| Single | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is single |
| Employed | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent is employed in a full-time or part-time job |
| Income Group 1 | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent's household has a pre-tax income below $40,000 over the previous 12 months |
| Income Group 2 | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent's household has a pre-tax income between $40,000 and $99,999 over the previous 12 months |
| Income Group 3 | NY Fed SCE and CBEAS | Dummy variable that equals 1 if the respondent's household has a pre-tax income of $100,000 or above over the previous 12 months |

*continued on next page*

Table A.1: **Variable Definitions** (*cont.*)

| **Variable Name** | **Source** | **Variable Definition** |
|---|---|---|
| Confidence | NY Fed SCE and CBEAS | Standard deviation of the probability distribution of numerical expectations for 12-month-ahead inflation. The probability distribution is elicited by asking respondents to allocate 100 percentage points across 10 bandwidths that might include the realized 12-month-ahead inflation rate. For instance: *"The rate of inflation will be between 4% and 8%: ... percent chance"* |
| Numeracy 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"In a sale, a shop is selling all items at half price. Before the same, a sofa costs $300. How much will it cost in the sale?"*, zero otherwise. |
| Numeracy 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"Let's say you have $200 in a savings account. The account earns ten per cent interest per year. Interest accrues at each anniversary of the account. If you never withdraw money or interest payments, how much will you have in the account at the end of two years?"* |
| Probability 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"In the BIG BUCKS LOTTERY, the chances of winning a $10.00 prize are 1%. What is your best guess about how many people would win a $10.00 prize if 1,000 people each buy a single ticket from BIG BUCKS?"* |
| Probability 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?"* |
| Probability 3 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"The chance of getting a viral infection is 0.0005. Out of 10,000 people, about how many of them are expected to get infected?"* |
| Fin. Literacy 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money left in this account?"* |
| Fin. Literacy 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question *"Please tell me whether this statement is true or false: Buying a single company's stock usually provides a safer return than a stock mutual fund."* |
| Grocery Shopper | CBEAS | Dummy variable that equals 1 if the respondent is the primary grocery shopper for the household |

Table A.2: **Inflation Expectations: Gender and Grocery Shopping**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Across Households | | | Within Households | | |
| Female | 0.291*** | | 0.134 | 0.330*** | | 0.162 |
| | (0.081) | | (0.092) | (0.106) | | (0.119) |
| Grocery Shopper | | 0.474*** | 0.413*** | | 0.516*** | 0.415*** |
| | | (0.106) | (0.118) | | (0.132) | (0.149) |
| Demographics | X | X | X | X | X | X |
| Expectations | X | X | X | X | X | X |
| Household FE | | | | X | X | X |
| $R^2$ | 0.107 | 0.108 | 0.108 | 0.616 | 0.616 | 0.611 |
| Obs. | 20,866 | 20,866 | 20,866 | 20,866 | 20,866 | 20,866 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.2 reports ordinary-least-squares coefficients and standard errors clustered at the household level (in parentheses), estimated on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table A.3: **Inflation Expectations: Gender or Traditional Norms?**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Sample | Female No Groceries | Female Some Groceries | Full Sample | Female Not Stay Home | Female Stay Home | Full Sample |
| Female | −0.186 | 0.382*** | -0.486 | 0.249** | 0.648** | 0.241** |
| | (0.357) | (0.111) | (0.336) | (0.113) | (0.322) | (0.111) |
| Female × | | | 0.716** | | | 0.506* |
| Some Groc./Stay Home | | | (0.321) | | | (0.287) |
| Demographics | X | X | X | X | X | X |
| Expectations | X | X | X | X | X | X |
| Household FE | X | X | X | X | X | X |
| $R^2$ | 0.657 | 0.615 | 0.616 | 0.624 | 0.614 | 0.616 |
| Obs. | 1,806 | 19,060 | 20,866 | 17,289 | 3,577 | 20,866 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.3 reports ordinary-least-squares coefficients and standard errors clustered at the household level (in parentheses), estimated in the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table A.4: **Inflation Expectations and Inflation Perceptions**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| | Inflation Expectations | | | |
| Inflation Perception | 0.659*** | 0.732*** | 0.424* | 0.576*** |
| | (0.0726) | (0.0546) | (0.208) | (0.122) |
| Female | -0.284 | -0.474 | -0.442 | -0.721 |
| | (0.287) | (0.351) | (0.723) | (0.830) |
| (Inflation Perception) X (Female) | -0.052 | -0.005 | 0.116 | 0.178 |
| | (0.0815) | (0.107) | (0.216) | (0.259) |
| Grocery Shopper | | 0.555 | | 0.928 |
| | | (0.346) | | (0.767) |
| (Inflation Perception) X (Grocery Shopper) | | -0.127 | | -0.220 |
| | | (0.108) | | (0.241) |
| Demographics | X | X | X | X |
| Expectations | X | X | X | X |
| Household Fixed Effects | | | X | X |
| Obs. | 10,188 | 10,188 | 10,188 | 10,188 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.4 reports ordinary-least-squares coefficients and standard errors clustered at the household level (in parentheses), estimated on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table A.5: **Gender and Economic Expectations: Multivariate Analysis**

| | (1) Short-Term Inflation | (2) Long-Term Inflation | (3) House Prices | (4) Stock Prices | (5) Perceived Fin. Sit. | (6) US Gov't Debt |
|---|---|---|---|---|---|---|
| *St. dev.* | *13.2 pp* | *13.3 pp* | *9.9 pp* | *23.1 pp* | *8.56 pp* | *33.9 pp* |
| *Median* | *3 pp* | *3 pp* | *5 pp* | *50 pp* | *0 pp* | *10 pp* |
| Female | 0.08*** | 0.04*** | 0.08*** | -0.24*** | -0.07*** | 0.05*** |
| | (0.01) | (0.02) | (0.02) | (0.02) | (0.02) | (0.01) |
| Age | 0.00** | 0.00 | 0.00*** | -0.00*** | -0.01*** | -0.00** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Hispanic | 0.01 | 0.02 | 0.06 | -0.16*** | 0.12*** | 0.01 |
| | (0.03) | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) |
| Black | 0.21*** | 0.25*** | 0.14*** | -0.07* | 0.07 | 0.10*** |
| | (0.04) | (0.04) | (0.05) | (0.04) | (0.04) | (0.03) |
| Asian | 0.04 | 0.05 | -0.02 | -0.01 | -0.01 | -0.01 |
| | (0.04) | (0.04) | (0.07) | (0.06) | (0.06) | (0.03) |
| Some College | 0.03 | 0.04 | 0.04 | 0.04 | -0.04 | 0.07*** |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.02) |
| College | -0.03 | -0.04 | -0.02 | 0.14** | -0.01 | 0.04* |
| | (0.04) | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) |
| Postgraduate | -0.03 | -0.02 | -0.01 | 0.15*** | -0.00 | 0.04 |
| | (0.03) | (0.04) | (0.04) | (0.04) | (0.04) | (0.02) |
| Single | 0.01 | 0.03 | 0.03 | 0.05* | 0.01 | 0.01 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.01) |
| Employed | -0.01 | -0.02 | -0.01 | 0.03 | 0.26*** | -0.01 |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.01) |
| Income Group 1 | 0.01 | 0.01 | 0.06*** | -0.06** | -0.10*** | -0.02 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.01) |
| Income Group 3 | 0.074*** | 0.053*** | 0.10*** | -0.10*** | -0.27*** | 0.00 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.01) |
| Confidence | 0.01*** | 0.01*** | 0.01*** | 0.00 | -0.00 | 0.01*** |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| Numeracy 1 | -0.01 | -0.06 | -0.08 | 0.07 | -0.05 | 0.07 |
| | (0.07) | (0.07) | (0.07) | (0.08) | (0.07) | (0.05) |
| Numeracy 2 | -0.07*** | -0.07*** | -0.05*** | 0.10*** | 0.01 | -0.03*** |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.01) |
| Probability 1 | -0.08*** | -0.08*** | -0.05 | 0.07** | 0.02 | -0.02 |
| | (0.03) | (0.03) | (0.04) | (0.03) | (0.03) | (0.02) |
| Probability 2 | -0.01 | -0.06 | -0.08* | -0.01 | 0.04 | -0.05* |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.02) |
| Probability 3 | 0.01 | -0.00 | -0.01 | 0.03 | 0.04 | 0.02 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.02) |
| Fin. Literacy 1 | 0.03 | 0.03 | -0.03 | 0.06* | 0.03 | 0.01 |
| | (0.03) | (0.04) | (0.04) | (0.03) | (0.04) | (0.02) |
| Fin. Literacy 2 | -0.11** | -0.11** | -0.20*** | 0.08* | -0.06 | -0.04 |
| | (0.05) | (0.05) | (0.06) | (0.05) | (0.04) | (0.03) |
| Constant | -0.08 | 0.08 | 0.05 | -0.11 | 0.31*** | -0.05 |
| | (0.11) | (0.11) | (0.11) | (0.11) | (0.10) | (0.08) |
| $R^2$ | 0.07 | 0.06 | 0.06 | 0.06 | 0.07 | 0.07 |
| Obs. | 39,645 | 39,645 | 39,645 | 39,603 | 39,621 | 39,645 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.5 reports ordinary-least-squares coefficients and standard errors (in parentheses) clustered at the individual level, estimated on the *New York Fed Survey of Consumer Expectations*. Outcome variables are standardized so that coefficients refer to the number of standard deviations associated with each independent variable. We report the value of one standard deviation of each outcome variable and its median below the variables names. All variables are defined in Table A.1. The sample period is from June 2013 to April 2018.

Table A.6: **Gender and Economic Expectations: Only Mathematically and Financially Literate**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Short-Term Inflation | Long-Term Inflation | House Prices | Stock Prices | Perceived Fin. Sit. | US Gov't Debt |
| Female | 0.13*** | 0.08** | 0.14*** | -0.20*** | -0.06 | 0.05*** |
| | (0.03) | (0.03) | (0.03) | (0.04) | (0.04) | (0.02) |
| Demographics | X | X | X | X | X | X |
| Income Group FE | X | X | X | X | X | X |
| Year-month FE | X | X | X | X | X | X |
| $R^2$ | 0.02 | 0.02 | 0.03 | 0.04 | 0.07 | 0.04 |
| Obs. | 15,781 | 15,781 | 15,781 | 15,762 | 15,773 | 15,781 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.6 reports ordinary-least-squares coefficients and standard errors (in parentheses) clustered at the individual level, estimated on the *New York Fed Survey of Consumer Expectations*. The sample is limited to respondents who provide correct answers to the survey questions labeled Numeracy 1, Numeracy 2, Probability 1, Probability 2, Probability 3, Fin. Literacy 1, Fin. Literacy 2, described in Table A.1. Outcome variables are standardized so that coefficients refer to the number of standard deviations associated with each independent variable. All variables are defined in Table A.1. The sample period is from June 2013 to April 2018.

Table A.7: **Gender and Economic Expectations: Price Categories**

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | Grocery Prices | Gas Prices | Medical Expenses | Schooling Expenses | Housing Rents |
| Female | 0.02* | -0.02* | 0.02* | 0.03** | 0.03*** |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Demographics | X | X | X | X | X |
| Quantitative Skills | X | X | X | X | X |
| Income Group FE | X | X | X | X | X |
| Year-month FE | X | X | X | X | X |
| $R^2$ | 0.07 | 0.06 | 0.06 | 0.07 | 0.07 |
| Obs. | 39,645 | 39,645 | 39,645 | 39,645 | 39,645 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.7 reports ordinary-least-squares coefficients and standard errors (in parentheses) clustered at the individual level, estimated on the *New York Fed Survey of Consumer Expectations*. Outcome variables are standardized so that coefficients refer to the number of standard deviations associated with each independent variable. All variables are defined in Table A.1. The sample period is from June 2013 to April 2018.

Table A.8: **Gender and Uncertainty of Economic Expectations**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Rounding ST Inflation | Rounding LT Inflation | Rounding House Prices | Volatility ST Inflation | Volatility LT Inflation | Volatility House Prices |
| Female | 0.11*** | 0.09*** | 0.08*** | 2.01*** | 2.07*** | 1.18*** |
| | (0.01) | (0.01) | (0.01) | (0.28) | (0.27) | (0.17) |
| Demographics | X | X | X | X | X | X |
| Quantitative Skills | X | X | X | X | X | X |
| Income Group FE | X | X | X | X | X | X |
| Year-month FE | X | X | X | X | X | X |
| Panel | X | X | X | | | |
| Cross-section only | | | | X | X | X |
| $R^2$ | 0.13 | 0.12 | 0.04 | 0.21 | 0.24 | 0.19 |
| Obs. | 39,645 | 39,645 | 39,645 | 4,578 | 4,578 | 4,578 |

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

*Notes.* Table A.8 reports ordinary-least-squares coefficients and standard errors (in parentheses) clustered at the individual level, estimated on the *New York Fed Survey of Consumer Expectations*. Outcome variables are standardized so that coefficients refer to the number of standard deviations associated with each independent variable. All variables are defined in Table A.1. The sample period is from June 2013 to April 2018.