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GENDER ROLES AND THE GENDER EXPECTATIONS GAP

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ABSTRACT

Expectations about macro-finance variables, such as inflation, vary significantly across genders, even within the same household. We conjecture that traditional gender roles expose women and men to different economic signals in their daily lives, which in turn produce systematic variation in expectations. Using unique data on the contributions of men and women to household grocery chores, their resulting exposure to price signals, and their inflation expectations, we show that the gender expectations gap is tightly linked to participation in grocery shopping. We also document a gender gap in other economic expectations and discuss how it might affect economic choices.

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I Introduction

Beliefs about the future shape economic decisions, and they often differ systematically across genders. Women tend to hold significantly more distorted beliefs than men about key economic variables, ranging from consumer 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. 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.

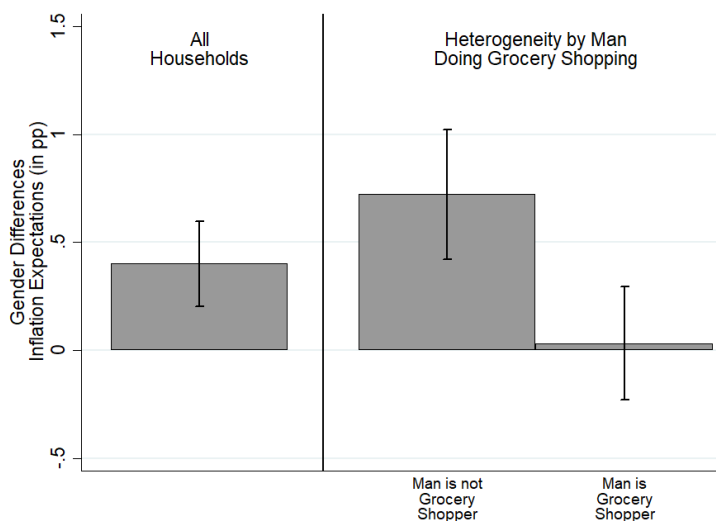
In this paper, we assess the role of traditional gender roles as a determinant of the gender expectations gap. Gender roles induce women and men to engage in different activities and to select into different environments in their daily lives. As a result, women and men have different experiences and are exposed to different signals about the economy. Exposure to different signals 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 Core consumer price index excludes food (and energy) to better identify inflation trends (Evans and Fisher, 2011). Since consumers focus disproportionately on

¹Cf. Bjuggren and Elert (2019); Jacobsen et al. (2014); Armantier et al. (2013); Bruine de Bruin et al. (2010).

²See 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.

price increases rather than decreases, as shown in the prior literature (Cavallo et al., 2017; Ranyard et al., 2008; Bates and Gabor, 1986), women’s exposure to volatile price changes can generate upward bias in their perception of current inflation and in their expectations of 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 detailed information about individuals’ participation in their household’s grocery chores and their corresponding exposure to price signals from a representative US sample (Kilts-Nielsen Consumer Panel) with individual-level elicitation of economic beliefs (Chicago Booth Expectations and Attitudes Survey, CBEAS).³

Our data are the first to establish the gender expectations gap *within* households. As shown in the left panel of Figure 1, the raw data indicates that women have significantly

³Following our paper, other researchers have started to elicit individual inflation expectations in the Kilts-Nielsen Consumer Panel through customized surveys (see, e.g., Coibion et al. (2019) and Coibion et al. (2020)).

higher inflation expectations than men, within (heterosexual) married couples.

The raw data also reveal a second novel fact, which is the focus of our analysis: The gender expectations gap varies substantially based on which spouse engages in grocery shopping. Households in which men do not partake in grocery chores fully explain the gender gap in inflation expectations (cf. middle bar of Figure 1). In households where spouses share grocery shopping more equally, we fail to detect any economically or statistically significant gender gap in inflation expectations (cf. right bar).

The economic magnitude of the gap, around 0.4-0.6 pp, is large, amounting to 25% of the US Federal Reserve's inflation target of 2%. Based on the Fisher equation, such upward bias implies that, for a given level of nominal rates, women perceive real interest rates to be lower than men, which in turn distorts consumption spending according to the consumer Euler equation. For example, given 1.5% nominal rates in the US economy over recent years, women would perceive real rates to be 33% lower than men.

Our multivariate analysis shows that the gender gap and the difference between households with and without male participation in grocery chores are robust features of the data. The gender gap is unaffected when we control for differences in risk preferences, numeracy, or financial literacy within households, which Lusardi and Mitchell (2008) and Niederle (2015) have shown to be important determinant of expectations. The results also 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. Moreover, as in the raw data, no gender difference exists once we restrict the analysis to grocery shoppers.

We also verify that men and women have a very similar mapping from their perception of current inflation to inflation expectations, which rules out that unobserved characteristics make men and women process information about current inflation differently.

Finally, we conduct a complementary analysis of the *New York Fed Survey of Consumer Expectations* (SCE). Here, we ask whether traditional gender norms also shape expectations other than inflation. The SCE contains information on gender, preferences, demographics, inflation expectations, house prices, medical expenses, the stock market,

and the government deficit, though not on grocery shopping and no within-household elicitation.

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

Lacking direct data on individuals' contribution to grocery chores as a measure of exposure to prices and adherence to traditional gender roles, we use two indirect proxies in the SCE. We identify two 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, as identified in the CBEAS data. The second subsample are respondents below 25 years of age, among whom the perception of traditional gender norms tends to be less stark (Glaeser and Ma, 2013; D'Acunto, 2018). In these two subsamples, the gender expectations gap is indeed lower for all measures of inflation. Moreover, we find that the volatility and the uncertainty of economic expectations are higher among women, which is consistent with women being exposed to volatile signals about prices such as grocery prices, which change frequently.

Overall, our results support the conjecture that 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 can 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 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). In such times, inflation expectations

directly shape perceived real interest rates and determine consumption and savings decisions as captured by 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.

At the micro level, distorted inflation expectations can be detrimental to individual 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.

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-connnotated 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, sometimes shop, or never do the shopping, 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 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 the main grocery shopper in 5,135 households (65%), whereas male heads did so only in 908 households (12%),⁴ and another household member in the remaining 1,803 households (22%). Other household members who report being the main grocery shopper are typically female individuals whose age is

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

higher than the age of both male and female heads, and who do not enter our analysis.

In a complementary analysis, we study the gender expectations gap for a longer period than available through the KNCP waves in the SCE data from June 2013 to April 2018. The SCE has become a key survey tool to study the effectiveness of monetary policy in the US.⁵ It 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. 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 help explain the gender expectations gap. As they undertake 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 differential exposure could explain the higher inflation expectations among women because individuals focus disproportionately more on price increases rather than decreases (Cavallo et al., 2017; Ranyard et al., 2008; Bates and Gabor, 1986), and tend to map their perception of current price changes into inflation expectations (D’Acunto et al., 2019).

As previewed in Figure 1 in the introduction, the raw data of the CBEAS reveals that women’s inflation expectations are on average 0.40 percentage points higher than those of men ($p < 0.01$). The 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 small and insignificant difference of 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 pattern

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

is qualitatively similar in households with a “stay-home mum,” in which the gender difference amounts to 0.58 pp, compared to 0.36 pp in other households, albeit with both differences being statistically significant ($p < 0.01$).

The economic magnitude of the gender difference is sizable: The inflation target of the Federal Reserve is 2% per year, and realized inflation was less than 2% during our survey months. Hence, the gender expectations gap amounts to more than a quarter of both targeted and realized inflation in terms of economic magnitude.

We test whether these patterns from the raw data persist in a multivariate setting in which we account for demographic variables and preferences that might affect gender differences in inflation expectations. We estimate a linear model regressing inflation expectations on gender and our proxy for gender roles, controlling for 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, reported risk tolerance, and confidence of inflation expectations (individual-level variance of the probability distribution of inflation expectations). The confidence proxy captures the possibility that women might generally be less (over-)confident or less certain than men: The higher the variance, the less confident is the respondent about their expectations of future inflation. Additionally, we control for a set of expectations about *other* economic variables that might predict inflation expectations, including expectations about individual income, individual financial soundness, and aggregate US growth. In the most restrictive specification, we include household fixed effects to ensure that time-invariant heterogeneity across households does not explain our results.

Figure 2 displays the same gender differences as Figure 1, but based on the estimates from the multivariate analysis. The pattern is very similar to the raw data. Within households, 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 analysis in Online-Appendix Table A.2 provides the same insight, including the disappearance of gender differences after controlling for grocery-price

exposure. Columns 1 to 3 display the estimation results from three specifications: using an indicator for female as independent variable (in column 1), using an indicator for being the main grocery shopper as independent variable (in column 2), and including both variables (in column 3). Columns 4 to 6 show parallel estimations but within household.

Across households, women exhibit 0.29 p.p. ($p < 0.01$) higher inflation expectations than men (column 1), and 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). Most importantly, however, the specification in column 3 reveals that, after controlling for participation in grocery shopping, no significant gender difference in inflation expectations is detectable, neither economically nor statistically (0.13 p.p., $p = 0.14$), whereas the coefficient on grocery shopping remains largely unchanged (0.41 p.p., $p < 0.01$). All findings continue to hold, and the coefficient estimates remain quantitatively very similar, when we restrict the estimation to variation within households (columns 4-6). These estimates imply that innate (or otherwise induced) gender-specific variation cannot generate the gender difference in beliefs after controlling for grocery-price exposure. Instead, the exposure to different price signals can predict the gender differences in beliefs.

We complement these results with estimations based on sample splits and on the alternative stay-home proxy. First, we split the full sample into the subsample of households whose female heads do not participate in grocery shopping at all and the complementary subsample where the female head does at least some grocery shopping. As shown in column 1 of Table A.3 in the Online Appendix, we detect no gender expectations gap between male and female heads in households whose female heads do not participate in grocery shopping at all. Consistent with the estimates above, the coefficient estimate for female heads becomes negative and insignificant. Note that this subsample is small—it only comprises 8.7% of the full representative sample. By contrast, the gender expectations gap between female and male heads is positive and significant in the remainder of the sample (columns 2). The pooled-sample specification in column 3 confirms that the difference is significant: When we include a dummy for observations in the complementary sample (where women do at least some shopping) interacted with the indicator for a female respondent, the female dummy is insignificant and the interaction

effect significantly positive. Hence, the gender expectations gap does not appear to be driven by intrinsic characteristics related to gender, but participation in grocery shopping emerges a crucial channel to explain the gap.

Columns 4-6 of Table A.3 confirm these findings qualitatively using the stay-home mum proxy for traditional gender norms and exposure to different price signals in daily life. We find that the gender expectations gap is larger for the subsample of households where the female head is a homemaker (columns 5), relative to households where the female head is employed in the formal labor market (column 4). The difference becomes economically even larger and remains statistically marginally significant in the pooled-sample specification where we interact the female and subsample indicators (column 6).

IV Mechanisms

Our research hypothesis posits that, given the large and volatile price changes of groceries, frequent exposure to grocery prices biases women’s beliefs about inflation. The underlying mechanism can be broken down into two parts: First, the differential exposure generates higher inflation perceptions, that is, women perceive current inflation to be higher than men. Second, the gender 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. Panel A displays the gender gap in the perception of current inflation (the percentage change in consumer prices over the last twelve months) in the raw data. In line with the results for inflation expectations, women perceive current inflation to be higher than men (left bar), and this gender difference only occurs in households in which men do not participate in grocery shopping (middle and right bars). As with inflation expectations, these results also hold conditional on all observables we discussed before (Panel B).

We assess the second part of the proposed mechanism in Figure 4. The binscatter map expectations of future inflation against perceptions of current inflation, with men’s observations shown as triangles and women’s as circles. Panel A documents a strong correlation between perceptions and expectations. Moreover, this correlation does not

vary systematically across genders as the plots for males and females overlap tightly.

The same holds when we account for selection into grocery-shopping, which might be correlated not only with gender but also with (gender-specific) characteristics that could explain our results. As shown in Panel B of Figure 4, we find a very similar mapping between inflation perceptions and expectations whether we focus on men or women who do or do not go grocery shopping.

The uniform mapping between perceived and expected inflation also holds up when estimated in a multivariate linear regression using inflation expectations as the dependent variable, and inflation perceptions, the indicator for being female, and their interaction as independent variables, conditional on the same controls discussed above. Inflation perceptions are a strong predictor of inflation expectations, whereas both the coefficient on the interaction with inflation perceptions (-0.052 , $p=0.527$) and the gender coefficient (-0.284 , $p=0.321$) are insignificant.

In summary, women do not have a different mapping function of inflation perceptions into expectations than men, and hence innate cognitive gender-specific characteristics are unlikely to play a role in the process of mapping inflation perceptions into expectations. Instead, higher exposure to grocery price inflation predicts higher perceptions, which in turn map into higher expectations.

V External Validity and Other Expectations

The CBEAS data is unique in that it is the first data to jointly report participation in grocery chores, exposure to specific grocery prices, and inflation expectations for both male and female household heads within the same household. We now 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 it 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 includes 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 data reveals a significant gender expectations gap across all expectation measures. 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.4, 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 on top 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.5, 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.6). 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.7.

As discussed, we cannot construct the same gender-role proxy in the SCE as in the CBEAS since the CBEAS data is unique in providing both expectations data and participation in grocery chores. To provide indirect evidence also for the SCE, we study specific subsamples that are likely to differ in their compliance with traditional gender roles. The first subsample approximates 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 gap in inflation expectations is lower in the subsample with male involvement in grocery chores and the subsample of young couples, where traditional gender roles are likely less stark. This holds for any type of inflation measure, as well as for almost all variables overall.⁶

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 explaining 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.

⁶Beliefs 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.

These subtle effects of gender roles are hard to tackle with targeted policy interventions. Policies 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 relative to men's, women's exposure to a wider range of economic signals and environments would need to be fostered, which seems difficult to enforce through legislation or regulation.

Another relevant 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 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 will affect the gender expectations gap going forward.

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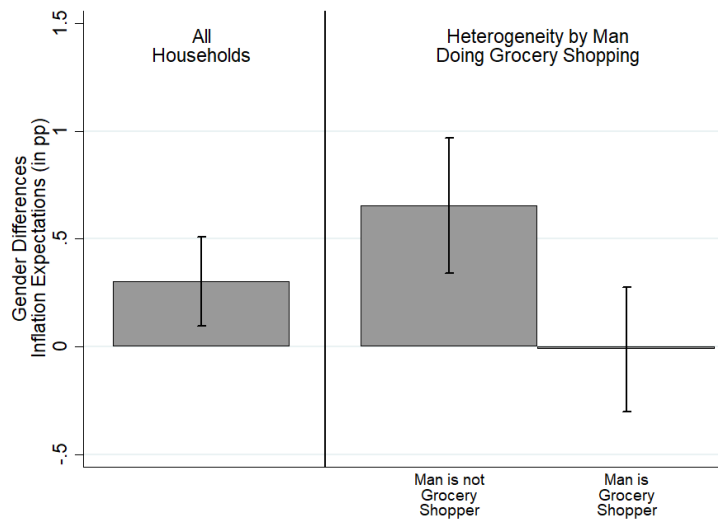
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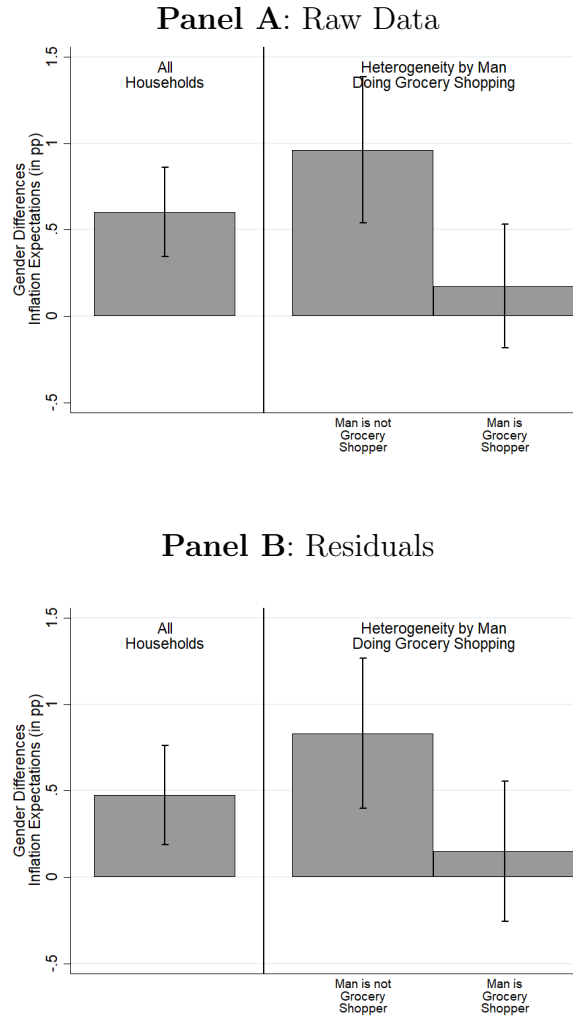
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Figure 2: Gender Expectations Gap Within Households: Residuals



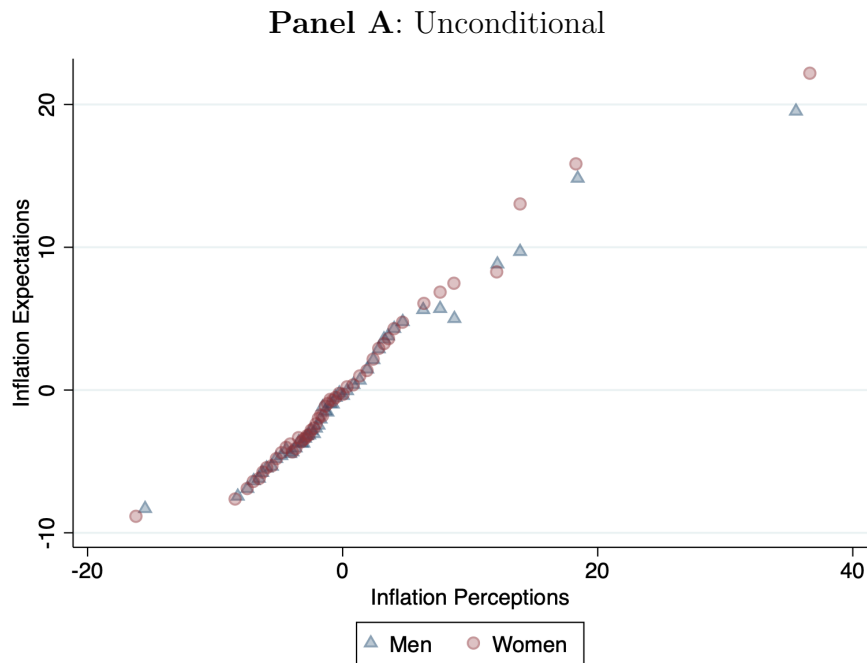
Notes. The leftmost bar of Figure 2 plots the average differences in the inflation expectations of women and men within all households headed by heterosexual couples in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016, conditional 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



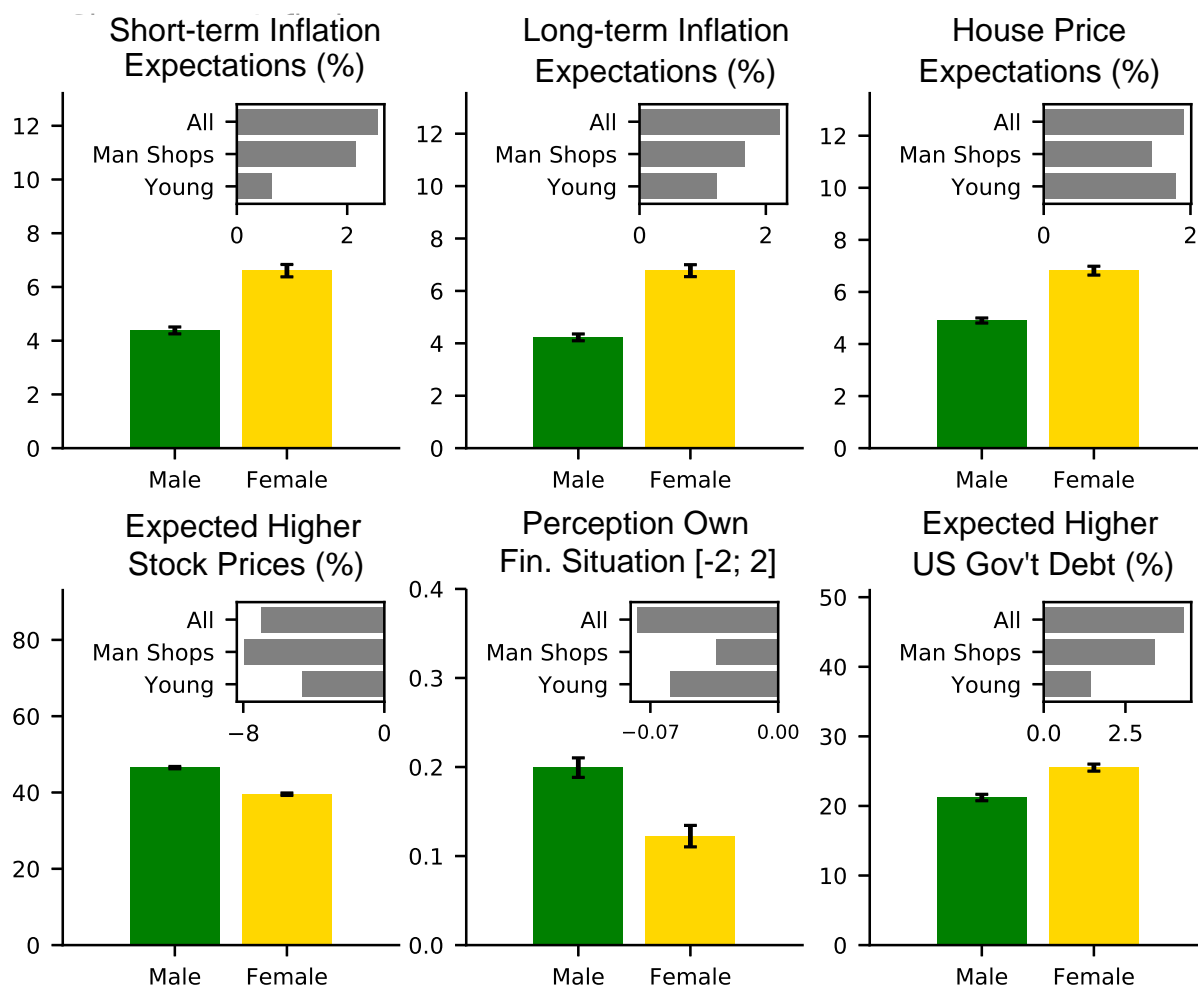
Notes. The leftmost bar of Figure 3 Panel A plots the average differences in the inflation perceptions of women and men for all households in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. The two bars on the right propose 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



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:
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 <i>"Do you think you (and any family living with you) are financially better or worse off these days than you were 12 months ago?"</i> Five ordered categorical answers range from <i>"Much Worse off" (-2)</i> to <i>"Much Better off" (2)</i> . |
| 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 Definition

| 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: <i>“The rate of inflation will be between 4% and 8%: ... percent chance”</i> |
| Numeracy 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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?”</i> , zero otherwise. |
| Numeracy 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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?”</i> |
| Probability 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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?”</i> |
| Probability 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?”</i> |
| Probability 3 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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?”</i> |
| Fin. Literacy 1 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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?”</i> |
| Fin. Literacy 2 | NY Fed SCE | Dummy variable that equals 1 if the respondent replied correctly to the question <i>“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.”</i> |
| 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*** (0.081) | | 0.134 (0.092) | 0.330*** (0.106) | | 0.162 (0.119) |
| Main Grocery Shopper | | 0.474*** (0.106) | 0.413*** (0.118) | | 0.516*** (0.132) | 0.415*** (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). Observations are the responses of male female heads of household in the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. In all columns, the outcome variable is respondents' 12-month ahead numerical inflation expectations. *Female* is an indicator for female heads; *MainGroceryShopper* is an indicator equal to 1 if the respondents who declare that they are the main grocery shopper for the household; *Demographics* include age, square of age, employment status, 16 income dummies, home ownership, marital status, college dummy, four race dummies, reported risk tolerance, and confidence in inflation expectations accuracy. *Expectations* include dummies for respondents' 12-month-ahead qualitative income expectations, 12-month-ahead individual financial soundness, and 12-month-ahead aggregate US growth.

Table A.3: Inflation Expectations: Subsamples and Stay-Home Mums

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|-----------------------------|---------------------------|--------------------|-----------------------|---------------------------|--------------------|
| Sample | Female Head No Groceries | Female Head Some Groc. | Full Sample | Female Head Worker | Female Head Stays Home | Full Sample |
| Female | -0.186 (0.357) | 0.382*** (0.111) | -0.486 (0.336) | 0.249** (0.113) | 0.648** (0.322) | 0.241** (0.111) |
| Female × Female Head Some Groc./ Female Head Stays Home | | | 0.716** (0.321) | | | 0.506* (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). Observations are the responses of male female heads of household in the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. In all columns, the outcome variable is respondents' 12-month ahead numerical inflation expectations. Column (1) restricts the sample to households whose female head does not do any groceries. Columns (2) uses the complementary sample of households whose female head does at least some groceries, that is, she is the main grocery shopper or does some grocery shopping. Column (4) restricts the sample to households whose female head is employed in the formal labor market. Column (5) uses the complementary sample of households whose female head is a homemaker. In columns (3) and (6), the indicators *Female Head Some Groc.* and *Female Head Stays Home* equal 1 for both male and female heads of households whose female head does some groceries or is a homemaker, respectively. (The levels of these household-level indicators are fully absorbed by the household fixed effect.) *Female* is a dummy variable that equals 1 for female heads, and zero otherwise. *Demographics* include age, square of age, employment status, 16 income dummies, home ownership, marital status, college dummy, four race dummies, reported risk tolerance, and confidence in inflation expectations. *Expectations* include dummies for respondents' 12-month-ahead qualitative income expectations, 12-month-ahead individual financial soundness, and 12-month-ahead aggregate US growth.

Table A.4: Gender and Economic Expectations: Multivariate Analysis

| | (1) | (2) | (3) | (4) | (5) | (6) |
|-----------------|-------------------------|------------------------|--------------------|--------------------|------------------------|--------------------|
| | Short-Term Inflation | Long-Term Inflation | House Prices | Stock Prices | Perceived Fin. Sit. | US Gov't Debt |
| <i>St. dev.</i> | 13.2 pp | 13.3 pp | 9.9 pp | 23.1 pp | 8.56 pp | 33.9 pp |
| <i>Median</i> | 3 pp | 3 pp | 5 pp | 50 pp | 0 pp | 10 pp |
| Female | 0.08*** (0.01) | 0.04*** (0.02) | 0.08*** (0.02) | -0.24*** (0.02) | -0.07*** (0.02) | 0.05*** (0.01) |
| Age | 0.00** (0.00) | 0.00 (0.00) | 0.00*** (0.00) | -0.00*** (0.00) | -0.01*** (0.00) | -0.00** (0.00) |
| Hispanic | 0.01 (0.03) | 0.02 (0.03) | 0.06 (0.04) | -0.16*** (0.04) | 0.12*** (0.04) | 0.01 (0.02) |
| Black | 0.21*** (0.04) | 0.25*** (0.04) | 0.14*** (0.05) | -0.07* (0.04) | 0.07 (0.04) | 0.10*** (0.03) |
| Asian | 0.04 (0.04) | 0.05 (0.04) | -0.02 (0.07) | -0.01 (0.06) | -0.01 (0.06) | -0.01 (0.03) |
| Some College | 0.03 (0.04) | 0.04 (0.04) | 0.04 (0.04) | 0.04 (0.04) | -0.04 (0.04) | 0.07*** (0.02) |
| College | -0.03 (0.04) | -0.04 (0.03) | -0.02 (0.04) | 0.14** (0.04) | -0.01 (0.04) | 0.04* (0.02) |
| Postgraduate | -0.03 (0.03) | -0.02 (0.04) | -0.01 (0.04) | 0.15*** (0.04) | -0.00 (0.04) | 0.04 (0.02) |
| Single | 0.01 (0.02) | 0.03 (0.02) | 0.03 (0.02) | 0.05* (0.03) | 0.01 (0.03) | 0.01 (0.01) |
| Employed | -0.01 (0.02) | -0.02 (0.02) | -0.01 (0.02) | 0.03 (0.02) | 0.26*** (0.02) | -0.01 (0.01) |
| Income Group 1 | 0.01 (0.02) | 0.01 (0.02) | 0.06*** (0.02) | -0.06** (0.03) | -0.10*** (0.03) | -0.02 (0.01) |
| Income Group 3 | 0.074*** (0.02) | 0.053*** (0.02) | 0.10*** (0.02) | -0.10*** (0.03) | -0.27*** (0.03) | 0.00 (0.01) |
| Confidence | 0.01*** (0.00) | 0.01*** (0.00) | 0.01*** (0.00) | 0.00 (0.00) | -0.00 (0.00) | 0.01*** (0.00) |
| Numeracy 1 | -0.01 (0.07) | -0.06 (0.07) | -0.08 (0.07) | 0.07 (0.08) | -0.05 (0.07) | 0.07 (0.05) |
| Numeracy 2 | -0.07*** (0.02) | -0.07*** (0.02) | -0.05*** (0.02) | 0.10*** (0.03) | 0.01 (0.03) | -0.03*** (0.01) |
| Probability 1 | -0.08*** (0.03) | -0.08*** (0.03) | -0.05 (0.04) | 0.07** (0.03) | 0.02 (0.03) | -0.02 (0.02) |
| Probability 2 | -0.01 (0.04) | -0.06 (0.04) | -0.08* (0.04) | -0.01 (0.04) | 0.04 (0.04) | -0.05* (0.02) |
| Probability 3 | 0.01 (0.03) | -0.00 (0.03) | -0.01 (0.03) | 0.03 (0.03) | 0.04 (0.03) | 0.02 (0.02) |
| Fin. Literacy 1 | 0.03 (0.03) | 0.03 (0.04) | -0.03 (0.04) | 0.06* (0.03) | 0.03 (0.04) | 0.01 (0.02) |
| Fin. Literacy 2 | -0.11** (0.05) | -0.11** (0.05) | -0.20*** (0.06) | 0.08* (0.05) | -0.06 (0.04) | -0.04 (0.03) |
| Constant | -0.08 (0.11) | 0.08 (0.11) | 0.05 (0.11) | -0.11 (0.11) | 0.31*** (0.10) | -0.05 (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.4 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*. All dependent and independent variables are defined in Table A.1. Outcome variables are standardized. We report the value of one standard deviation of each outcome variable and its median below the variables names. The sample period is from June 2013 to April 2018.

Table A.5: **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*** (0.03) | 0.08** (0.03) | 0.14*** (0.03) | -0.20*** (0.04) | -0.06 (0.04) | 0.05*** (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.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*. All dependent and independent variables are defined in Table A.1. Outcome variables are standardized. 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. The sample period is from June 2013 to April 2018.

Table A.6: **Gender and Economic Expectations: Price Categories**

| | (1) | (2) | (3) | (4) | (5) |
|---------------------|-------------------|------------------|---------------------|-----------------------|-------------------|
| | Grocery Prices | Gas Prices | Medical Expenses | Schooling Expenses | Housing Rents |
| Female | 0.02* (0.01) | -0.02* (0.01) | 0.02* (0.01) | 0.03** (0.01) | 0.03*** (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.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 outcome variables are respondents' 12-month ahead numerical inflation expectations for each specific price category listed on top each column. All outcome variables are standardized and in Table A.1. The sample period is from June 2013 to April 2018.

Table A.7: 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*** (0.01) | 0.09*** (0.01) | 0.08*** (0.01) | 2.01*** (0.28) | 2.07*** (0.27) | 1.18*** (0.17) |
| Demographics | | | | | | |
| 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.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*. In columns (1)-(3), the outcome variable is a dummy variable that equals 1 if the respondent reported short-term, long-term, or house-price numerical inflation expectations rounded to a multiple of 5. In columns (4)-(6), the outcome variables are the within-individual variances of the short-term, long-term, and house-price numerical inflation expectations reported by each respondent who was interviewed more than once in the *New York Fed Survey of Consumer Expectations*. All other variables are defined in Table A.1. The sample period is from June 2013 to April 2018.