Gender Roles Distort Women's Economic Outlook*

Francesco D'Acunto† Ulrike Malmendier‡, and Michael Weber§

This version: August 2019

Abstract

Gender roles place women and men into different environments in their daily lives, where they observe different economic signals and make different experiences. We show that these differences in everyday exposure distort women's perceptions of key economic variables, also in areas that do not hold any gender connotation. Our analysis uses novel data of a representative US sample that combines detailed information about the distribution of shopping duties in couples, their corresponding exposure to price signals, and their individual economic expectations. Complying with traditional gender roles, women do most of the grocery shopping, which exposes them to high and volatile changes in grocery prices. This exposure increases women's perception of current inflation and their expectation of future inflation, relative to men. The distortion spills over to beliefs about house prices and the stock market, as well as perceptions of their own financial situation and the economy overall, which can have detrimental consequences for women's economic choices and outcomes, including gender inequality in the accumulation of wealth.

Keywords: Gender Inequality, Gender Roles, Perception, Cognition, Expectations, Wealth Inequality.

*We thank Johannes Hermle for excellent research assistance. We also thank Shannon Hazlett and Victoria Stevens at Nielsen for their assistance with the collection of the PanelViews Survey. We gratefully acknowledge financial support from the University of Chicago Booth School of Business and the Fama–Miller Center for Research in Finance to run the surveys.

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I Introduction

Women hold more distorted beliefs relative to ex-post realizations relative to men about key economic variables [1, 2], ranging from consumer-price and house-price inflation to expectations about stock prices, medical and schooling expenses, and their own financial situation. These distortions can have detrimental consequences on women's economic choices and long-term wealth and reduce the effectiveness of economic policies in times of crisis. Moreover, distorted beliefs about economic variables about which women care, such as consumer-price inflation, might affect their happiness and well-being [3].

In this paper, we argue that traditional gender norms are an important and yet neglected determinant of these distortions. Because gender roles induce women and men to engage in different activities and to select into different environments in their daily lives, women and men have different experiences and are exposed to different signals about the economy, which then lead to differences in economic perceptions and expectations.

To uncover these far-reaching effects of gender-specific differences in exposure to economic signals, we constructed a novel data set that combines individual-level elicitations of economic beliefs from a representative US sample with detailed information about the distribution of shopping duties and corresponding exposure to price changes within married couples. Our data reveal the partner that takes care of the groceries and the frequency of grocery shopping for each partner, and provide precise information about each purchased item. We show that, complying with traditional gender roles, women undertake the majority of grocery shopping for their households. In this way, they are exposed to grocery-price changes more frequently than men. Grocery-price inflation, in turn, is known to be highly volatile—so much so that the Bureau of Labor Statistics excludes grocery prices from the Core Consumer Price Index (Core CPI) [4], which is the main index of consumer-price inflation that US policymakers use to determine price stability. Because consumers focus disproportionately on positive price changes rather than price decreases [5, 6, 7], women's exposure to more volatile price changes are thus predicted to generate an upward bias in women's perception of current inflation and their beliefs about future inflation. Our analysis confirmed this prediction in the data.

Moreover, couples in which the woman assumed the majority of the shopping duties drove these gender differences. The differences disappeared in couples in which men also participated in grocery shopping. Differences in risk preferences, numeracy, or financial literacy, which have been studied in earlier research [8, 9], are confirmed in our results but do not drive the mechanism we uncover. Moreover, these gender-specific distortions spill over to distorted expectations about house prices, women's perception of their own financial situation, and the economy overall.

Inflation expectations are a key macroeconomic variable. They are central to the effectiveness of economic policy [10], especially in times of low interest rates, which are becoming common in most industrialized countries [11]. As the former chairwoman of the Federal Reserve, Janet Yellen, put it [12], "With nominal short-term interest rates at or close to their effective lower bound in many countries, the broader question of how expectations are formed has taken on heightened importance. [...] many central banks have [...] [been] adopting policies that are directly aimed at influencing expectations of future interest rates and inflation."

Systematic distortions in inflation expectations are thus detrimental to the effectiveness of aggregate policies that aim to stabilize the business cycle and avoid prolonged economic crises. They are also detrimental for individual economic outcomes. Consumers who expect higher prices might engage in excessive consumption spending, not accumulate enough for retirement, which usually includes investment in bonds, and make suboptimal real-estate investments. Women's systematic upward bias relative to men will adversely affect their financial decisions and wealth accumulation, which might further increase gender inequality in wealth.

Earlier research found that gender roles affect women's preferences, beliefs, and outcomes in several domains [13, 14, 15], including their choices of fields of education and skills [16, 17, 18], occupations [19], career paths [20, 21], and investment decisions [22]. In those areas, gender roles influence both women's own actions, as they comply with a prescribed gender role [23, 24], and the actions of others based on gender stereotyping [25, 26, 27, 28]. Being exposed to a new gendered viewpoint about life and socialization affects individual views and beliefs [29, 30]. In all of these cases, gender roles affect beliefs

regarding women's ability to conduct male-connotated tasks and outcomes that possess a gender-specific connotation.

Our findings reveal that even beyond decisions that are stereotypically "gendered," seemingly innocuous differences in women's daily exposure to prices can have significant consequences for perceptions and potentially for major economic choices. The evidence in our paper supports a yet undocumented relationship between gender roles and non-gendered beliefs and outcomes, which might be pervasive, subtle, and hard to reduce through policy interventions.

II Materials and Methods

The systematic assessment of gender differences in economic expectations and their relation to men's and women's daily exposure requires novel data that combine both the perceptions and expectations of a representative group of individuals for a large set of economic variables, and information on the behavior and choices of the same set of individuals. To address this challenge, we collected and combined two sets of data.

First, we exploited the *New York Fed Survey of Consumer Expectations* (NY Fed SCE) [31]. This survey collects a broad set of economic expectations for a representative population alongside demographic characteristics and 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 restricted the sample to respondents for whom we observe both expectations and financial skills. The sample 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 for this sample in Table S.1 and report a set of summary statistics for this sample in Table S.2.

Second, to address directly the conjecture that traditional gender roles distort women's economic perceptions and expectations, we constructed a novel representative dataset of US households with data on both role-reflecting behavior and beliefs about economic variables as follows: We used a sample of individuals representative of the

US population from the *Nielsen Homescan Panel Data Set*, for whom we have detailed information on all of the grocery purchases of these individuals' households. We then ran two waves of a survey (*Chicago Booth Expectations and Attitudes Survey*, CBEAS) on these individuals in July 2015 and July 2016, obtaining a panel structure of two observations per individual.

To test for the relationship between traditional gender roles and expectations, we limited the sample to heterosexual couples in which we observe the survey responses of both the male head and the female head. In these households, we can 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.[1]

In each survey, we elicited numerical inflation expectations and perceptions of all household members. We also asked respondents if they were the primary grocery shoppers of the household, and we recorded whether the female household head was a non-retired and non-unemployed homemaker, which we label "Stay-home Mum."[2]

Consistent with the notion that women are more likely to do the grocery shopping for the household, female heads declared that they were the primary grocery shopper in 5,135 households (65%), whereas male heads did so only in 908 households (12%), and another household member did in the remaining 1,803 households (22%). A two-sided t-test for whether the shares of primary grocery shoppers were equal across genders rejected the null hypothesis at any standard level of significance ($p < 0.01$).

III Results

We first calculated the average numerical 12-month-ahead expectations for a set of macroeconomic and financial variables in the *New York Fed Survey of Consumer Expectations* sample. These variables included short-term consumer price inflation, long-term consumer price inflation, house prices, stock prices, the size of the US

[1]Note that not all households and all household members responded in both waves. The detailed steps of the sample selection are summarized in Table S.7.

[2]The survey asks responses from both a male head and a female head, irrespective of whether gender roles within the household define only one of the members of the couple as the household head.

government debt, and individuals' own financial situations. Across all of these key macroeconomic variables, women's and men's expectations systematically differed. The vertical bars in Figure 1 document that, relative to men, women expected 55% higher short-term and long-term consumer price inflation and 38% higher house-price inflation. That is, women were significantly more pessimistic both about overall inflation and specifically about inflation in the housing market. Turning to the stock market, a smaller fraction of women (38%) than men (46%) expected stock prices to increase over the following 12 months. This difference in beliefs is economically important because it might explain why women stay away from stock investments, which have been historically very profitable and increased US households' wealth. Women also expected the likelihood that the US government debt would increase to be 25.5%, whereas men expected it to be 21%. Finally, turning to a household-specific survey question, only 12% of women in the sample perceived their financial situation to have improved over the previous 12 months relative to 20% of men.

These univariate differences in economic expectations across genders do not account for confounds at the individual level that might correlate with both gender and economic expectations. To alleviate concerns about omitted-variable bias, we estimated multivariate linear regressions controlling for a broad set of individual-level characteristics, including age, race, marital status, education, and income levels, as well as elicited numeracy and financial skills. The results remained unchanged, and numeracy and financial skills were unable to account for the gender differences (see Tables S.3 and S.4).[3]

We also found that differences in expectations persisted when we consider different types of consumer prices and expenses, including grocery prices, medical expenses, schooling expenses, and housing rents (see Table S.5). Moreover, women exhibited not only more pessimistic expectations, but also a higher volatility and uncertainty of expectations (Table S.6), computed as the within-individual volatility of numerical expectations as well as the tendency to provide rounded numerical expectations [32], [33].

[3]In Table S.4, we limited the sample to men and women who replied correctly to all the questions about numeracy and financial skills, that is, variables Numeracy 1, Numeracy 2, Probability 1, Probability 2, Probability 3, Fin. Literacy 1, Fin. Literacy 2 described in Table S.1.

In sum, across several gender-neutral dimensions, women's inflation expectations as well as other economic expectations were found to be more pessimistic and volatile than men's, and these differences are not explained by a wide range of individual-level demographics or other characteristics, including numeracy or financial skills.

We then turned to the hypothesis that (role-induced) differences in men's and women's daily exposure to price signals lead to the observed distortion in women's beliefs about inflation and other economic variables. In particular, we leveraged the exposure to grocery-price changes in consumers' daily lives. Complying with traditional gender roles, women undertake the majority of grocery shopping, as discussed above. They are thus exposed to grocery-price changes, which are more volatile and can feature relatively high changes, more frequently than men. Individuals focus disproportionately on positive price changes rather than negative price changes, because increases are perceived as losses resulting in an upward-biased perception of inflation ([5, 6, 7, 34]). Moreover, as previous research documents, individuals form economic expectations based on the price changes they observe in their daily lives [35].

The horizontal bars in Figure 1 report motivating evidence in line with our hypothesis. We compared the difference in economic expectations across men and women in the full sample ("All") to the gender differences in two subsamples where traditional gender roles tend to be less stark. The first subsample includes respondents from areas (the top 25% US states) where a high share of men does at least some grocery shopping for their households ("Man Shops"). The second subsample is the set of respondents below 25 years of age ("Young"), which we consider because the perception of traditional gender norms has become less stark for younger cohorts than for older cohorts of the US population [36], [22]. Consistent with our hypothesis, Figure 1 shows the differences in beliefs across men and women were 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.[4]

Motivated by this indirect evidence, we tested directly the hypothesis that traditional gender roles regarding grocery shopping distort women's inflation expectations through

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

their exposure to high and volatile grocery-price changes. We used the BEAS sample and calculated gender differences in expectations regarding the 12-month-ahead inflation rate, where standard errors are clustered at the household level. We tested for heterogeneity in gender differences by whether men participated in a household's grocery shopping, which proxies for a household's commitment to traditional gender roles.

Figure 2A presents the results. Women's inflation expectations were, on average, 0.40 percentage points higher than those of men ($p < 0.01$), consistent with the evidence in Figure 1. This average difference, however, masks substantial heterogeneity: households in which men do not participate in grocery shopping exhibited a 0.64 pp ($p < 0.01$) gender difference in inflation expectations relative to 0.10 pp ($p = 0.35$) in other households.[5] A two-sided t-test of equality of gender differences between the two samples was rejected at $p < 0.01$.

To alleviate concerns about omitted variable bias, we next re-estimated gender differences in inflation expectations using a multivariate ordinary-least-squares estimator, controlling for all demographics and other individual characteristics available in this data, including age, square of age, employment status, 16 income dummies, home ownership, marital status, household size, college dummy, four race dummies, reported risk tolerance, and even household fixed effects. In addition, we controlled for expectations about *other* economic variables that might predict systematically higher inflation expectations, including individual income expectations, expectations for aggregate US growth, and individual expectations about financial soundness. Because women might be, in general, less confident and optimist than men, we also constructed a proxy for individual-level confidence—the variance of the distribution of the inflation expectations we elicited for each respondent. The higher the variance, the less confident the respondent was in his or her expectations about future outcomes. Figure 2B reports the results confirming the raw data evidence: women exhibited, on average, a 0.30 p.p. (p<0.01) higher inflation expectation. However, in households in which men do not participate in grocery shopping, this gender difference amounted to 0.65 p.p. (p<0.01) compared to a -0.011

[5]Using an alternative proxy of traditional gender roles, we found qualitatively similar patterns: households with a female non-retired and non-unemployed home maker displayed a gender difference of 0.58 pp ($p < 0.01$) relative to 0.36 pp ($p < 0.01$) in other households.

p.p. (p=0.94) gender difference in other households.[6] To corroborate this result, we also performed a multivariate ordinary-least-squares regression using as dependent variable inflation expectations and as independent variables an indicator for being female as well as an indicator for grocery-shopping behavior, including the same set of controls (Table S.8). Without including household fixed effects, women exhibited a 0.22 p.p. (p<0.01) higher inflation expectation than men (column 1). In addition, respondents who were the main grocery shopper for the household exhibited 0.51 p.p. (p<0.01) higher inflation expectations than other respondents (column 2). Crucially, after controlling for grocery-shopping behavior, we found no statistically significant detectable gender difference (-0.09, p>83%), whereas the coefficient on grocery shopping remained largely unchanged (0.51, p<0.01). This finding also held when we added household fixed effects to the regression (columns 4 to 6). In sum, these results indicate traditional gender roles regarding shopping behavior distort women's inflation expectations.

IV Mechanisms

Our hypothesis posits that the exposure to large and volatile price changes in grocery prices, compared to general (CPI) inflation, biases women's beliefs about inflation. The rational of this argument has two parts: First, as a result of their stronger exposure to volatile grocery price inflation, relative to general (CPI) inflation, women have higher inflation perceptions of current inflation, because everyone focuses disproportionately on positive price changes which are perceived as losses rather than negative price changes [5, 6, 7, 34]. Second, these differences in inflation perceptions map directly into differences in expectations about (future) inflation.

To assess these two parts of our proposed mechanism, Figure 3A-B repeats the analysis of gender differences in expectations of (future) inflation from Figure 2 for perceptions of (current) inflation, that is, for the individual perceptions of the general prevailing inflation rate in the US economy over the previous 12 months. In line with our proposed mechanism, differences in inflation perceptions exhibited patterns qualitatively

[6] Parallel regression evidence is reported in Table S.9.

and quantitatively very similar to those for inflation expectations.

As an additional test, we verified that the mapping of perceptions of current inflation to expectations of future inflation does *not* vary by gender. (If the mapping differed systematically, gender-specific abilities or levels of cognition could explain our results.) Consistent with our hypothesis, we did not detect any systematic differences in how women and men map their inflation perceptions into inflation expectations (Figure 3C). The relationship between inflation expectations and perceptions had almost completely overlapping shapes for women and men, irrespective of whether we compared them across the subsamples of grocery shoppers or non-grocery shoppers (Figure S.3). This result was confirmed when we performed a multivariate OLS 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 as in Table 2. Both the raw gender coefficient (-0.28, $p = 0.321$) and the coefficient on the interaction with inflation perceptions (-0.05, $p = 0.527$) were estimated to be insignificant (Table S.10). The results remained robust when we additionally controlled for an indicator for grocery shopping, the interaction with inflation perceptions, and household fixed effects.

In sum, our results indicate that gender role-induced exposure to different economic environments leads to gender differences in the perception of current economic conditions, ultimately producing gender differences in economic expectations.

V Discussion

Overall, the evidence we provided supports the conjecture that seemingly innocuous differences in women's environments and daily exposure can have significant consequences for their beliefs about key economic variables. That is, traditional gender roles affect beliefs and outcomes not only in areas 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, but also in realms that have no gender connotation. In the context of grocery shopping, traditional gender roles expose women to different information about prices

than men. This differential exposure distorts women's inflation expectations, and also affects beliefs about related economic variables.

These subtle effects of traditional gender roles are potentially harder to tackle on the policy side. For outcomes that are more directly related to gender roles, policy interventions have been implemented around the world. Examples include the promotion of the presence of women in STEM disciplines [37] or the imposition of quotas on the ratio of genders in the boards of large companies [38]. Our results, however, mandate fostering women's access to unbiased economic information to reduce the gap between their economic expectations and ex-post realizations and hence likely improve their economic and financial choices. They also caution that changes in the daily activities of men and women, that is, as shopping outlets are increasingly moving to online retail, may have unanticipated consequences for gender differences in perceptions and beliefs as well as the ensuing economic decisions.

References

[1] C. M. Bjuggren, N. Elert, *Applied Economics* **0**, 1 (2019).

[2] B. Jacobsen, J. B. Lee, W. Marquering, C. Y. Zhang, *Journal of Economic Behavior & Organization* **107**, 630 (2014). Empirical Behavioral Finance.

[3] R. Di Tella, R. J. MacCulloch, A. J. Oswald, *American Economic Review* **91**, 335 (2001).

[4] B. of Labor Statistics, *BLS Handbook of Methods* (2018).

[5] A. Cavallo, G. Cruces, R. Perez-Truglia, *American Economic Journal: Macroeconomics* **9**, 1 (2017).

[6] R. Ranyard, F. Del Missier, N. Bonini, D. Duxbury, B. Summers, *Journal of Economic Psychology* **29**, 378 (2008).

[7] J. M. Bates, A. Gabor, *Journal of Economic Psychology* **7**, 291 (1986).

[8] A. Lusardi, O. S. Mitchell, *American Economic Review* **98**, 413 (2008).

[9] M. Niederle, *Handbook of Experimental Economics* (2015).

[10] B. S. Bernanke, *Speech at a conference on Revisiting Monetary Policy in a Low-Inflation Environment, Federal Reserve Bank of Boston, October* (2010), vol. 15.

[11] L. Summers, *Available at http://larrysummers.com/2018/05/06/the-threat-of-secular-stagnation-has-not-gone-away/* (2018).

[12] J. Yellen, *Speech at the 60th annual economic conference sponsored by the Federal Reserve Bank of Boston* (2016).

[13] R. Croson, U. Gneezy, *Journal of Economic literature* **47**, 448 (2009).

[14] M. Bertrand, *Handbook of Labor Economics* **4(B)**, 1543 (2011).

[15] R. B. Adams, P. Funk, *Management science* **58**, 219 (2012).

[16] C. MossRacusin, J. Dovidio, V. Brescoll, M. Graham, J. Handelsman, *Proceedings of the National Academy of Sciences* **109**, 16474 (2012).

[17] L. Guiso, F. Monte, P. Sapienza, L. Zingales, *Science* **320**, 1164 (2008).

[18] G. Dossi, D. N. Figlio, P. Giuliano, P. Sapienza, Born in the family: Preferences for boys and the gender gap in math, *Tech. rep.*, National Bureau of Economic Research (2019).

[19] A. Eagly, V. Steffen, *Journal of Personality and Social Psychology* **46**, 735 (1984).

[20] R. B. Adams, T. Kirchmaier, *American Economic Review* **106**, 277 (2016).

[21] C. Goldin, J. Mitchell, *Journal of Economic Perspectives* **31**, 161 (2017).

[22] F. D'Acunto, *Working Paper* (2018).

[23] C. Steele, *American Psychologist* **52**, 613 (1997).

[24] S. Correll, *American Sociological Review* **69**, 93 (2004).

[25] R. Fernández, A. Fogli, C. Olivetti, *The Quarterly Journal of Economics* **119**, 1249 (2004).

[26] L. Skewes, C. Fine, N. Haslam, *PLOS ONE* **13** (2018).

[27] A. Eagly, *Hillsdale, NJ: Erlbaum* (1987).

[28] L. Carli, L. Alawa, Y. Lee, *Psychology of Women Quarterly* **56**, 565 (2016).

[29] E. L. Washington, *American Economic Review* **98**, 311 (2008).

[30] A. J. Oswald, N. Powdthavee, *The Review of Economics and Statistics* **92**, 213 (2010).

[31] O. Armantier, G. Topa, W. Van der Klaauw, B. Zafar, *Economic Policy Review* pp. 51–72 (2017).

[32] C. Manski, F. Molinari, *Journal of Business Economics and Statistics* **28**, 219 (2010).

[33] C. Binder, *Journal of Monetary Economics* **90**, 1 (2017).

[34] A. Tversky, D. Kahneman, *Science* **185**, 1124 (1974).

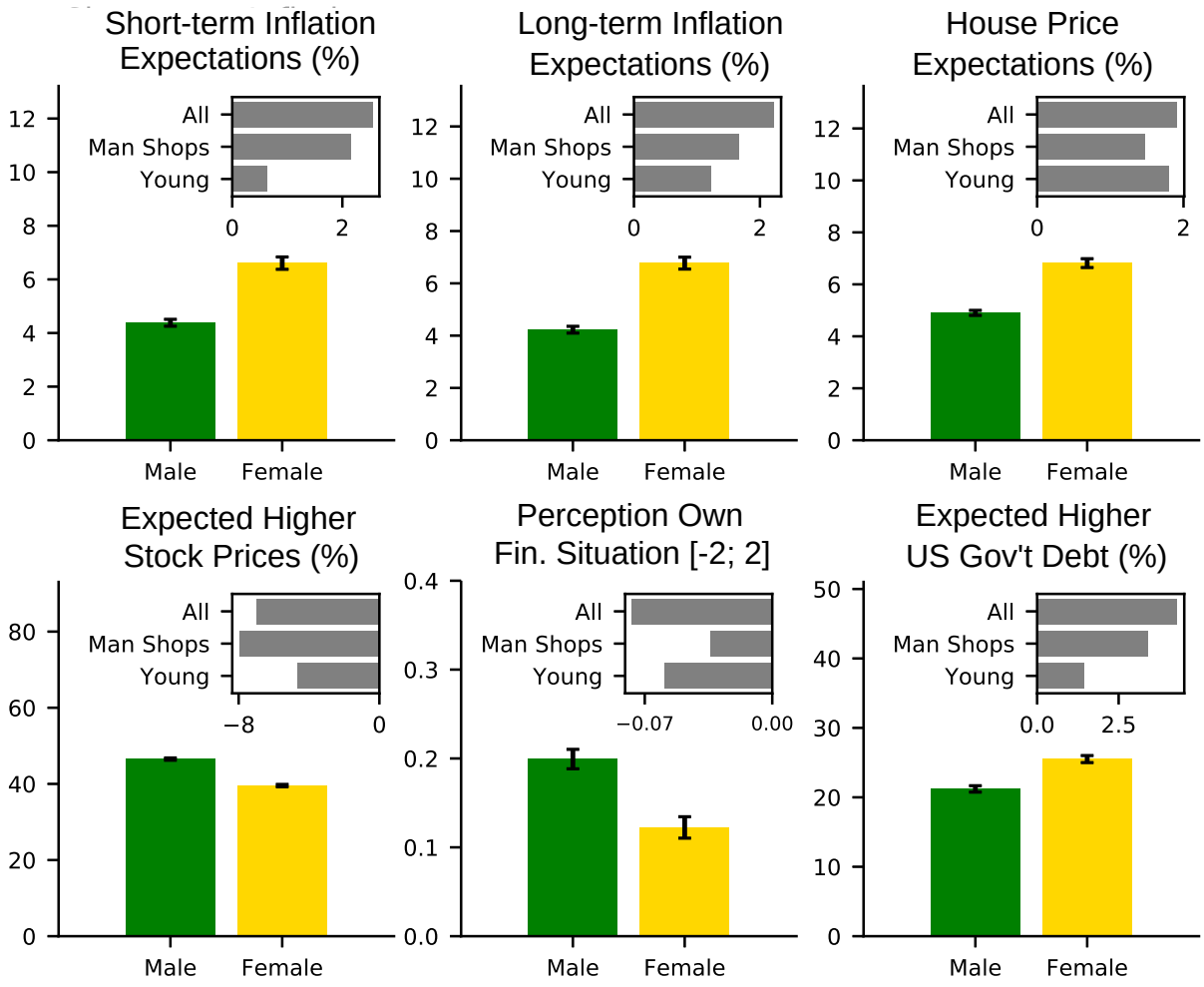
[35] F. D'Acunto, U. Malmendier, J. Ospina, M. Weber, *Working Paper* (2018).

[36] E. Glaeser, Y. Ma, *NBER working paper no. 19109* (2013).

[37] H. United States Congress, *Public Law No.: 115-6 (02/28/2017)* (2017).

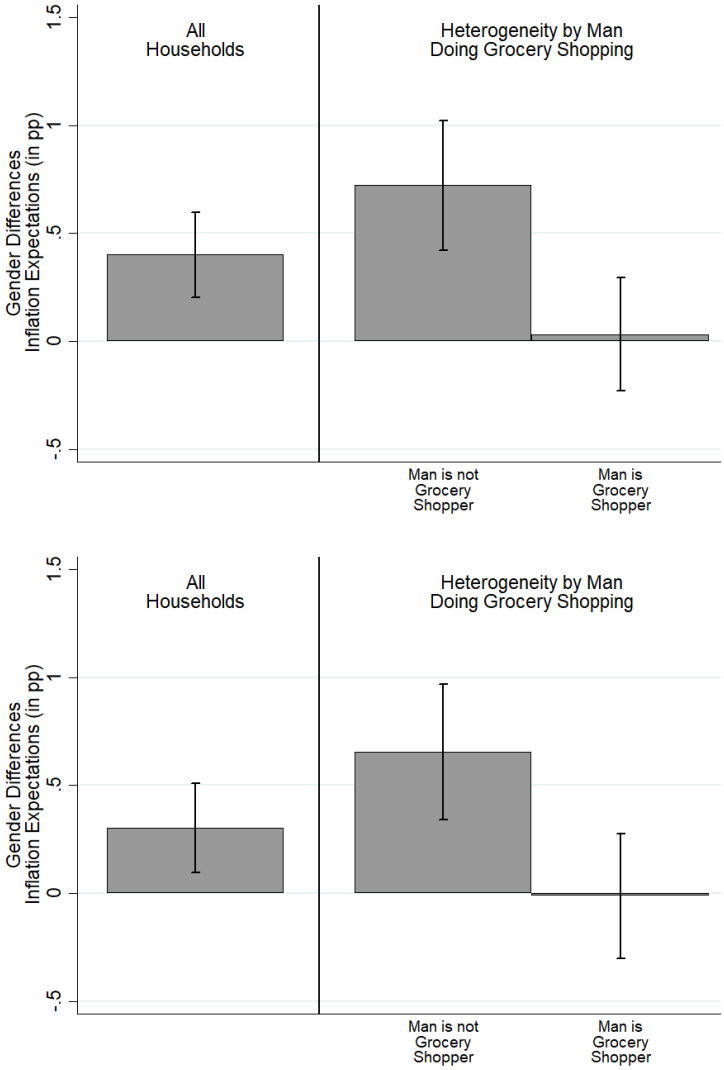
[38] E. P. Department, *EU Notes* (2012).

Figure 1: **Gender and Economic Expectations**



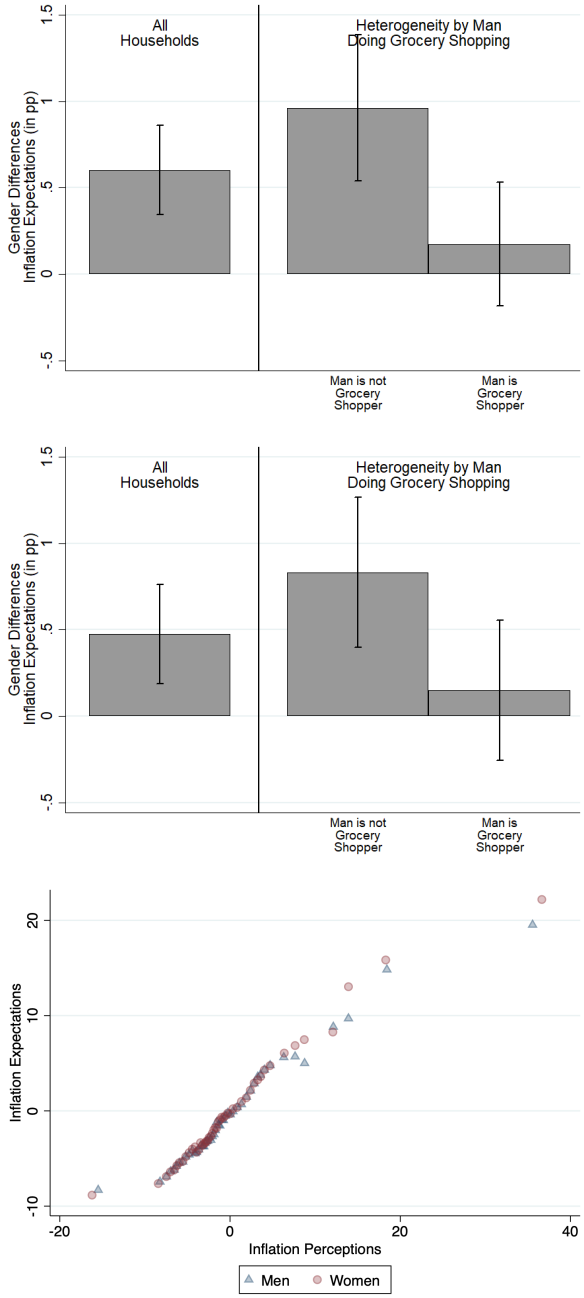
Notes. The vertical bars in this figure report the estimated mean for men (green, left bar) and women (yellow, right bar) of a set of numerical expectations elicited by the *New York Fed Survey of Consumer Expectations* (see [31]). Black segments are 95% confidence intervals. Grey horizontal bars indicate 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.

Figure 2: **Inflation Expectations: The Role of Traditional Gender Norms**



Notes. The leftmost bar of Figure 2A plots the average differences in the inflation expectations 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 2B 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 3: **Inflation Perceptions: The Role of Traditional Gender Norms and their Link to Inflation Expectations**



Notes. The leftmost bar of Figure 3A 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 3B 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 3C plots a binscatter plot mapping inflation perceptions into inflation expectations by gender.

Supplementary Materials:

Gender Roles Distort Women's Economic Outlook

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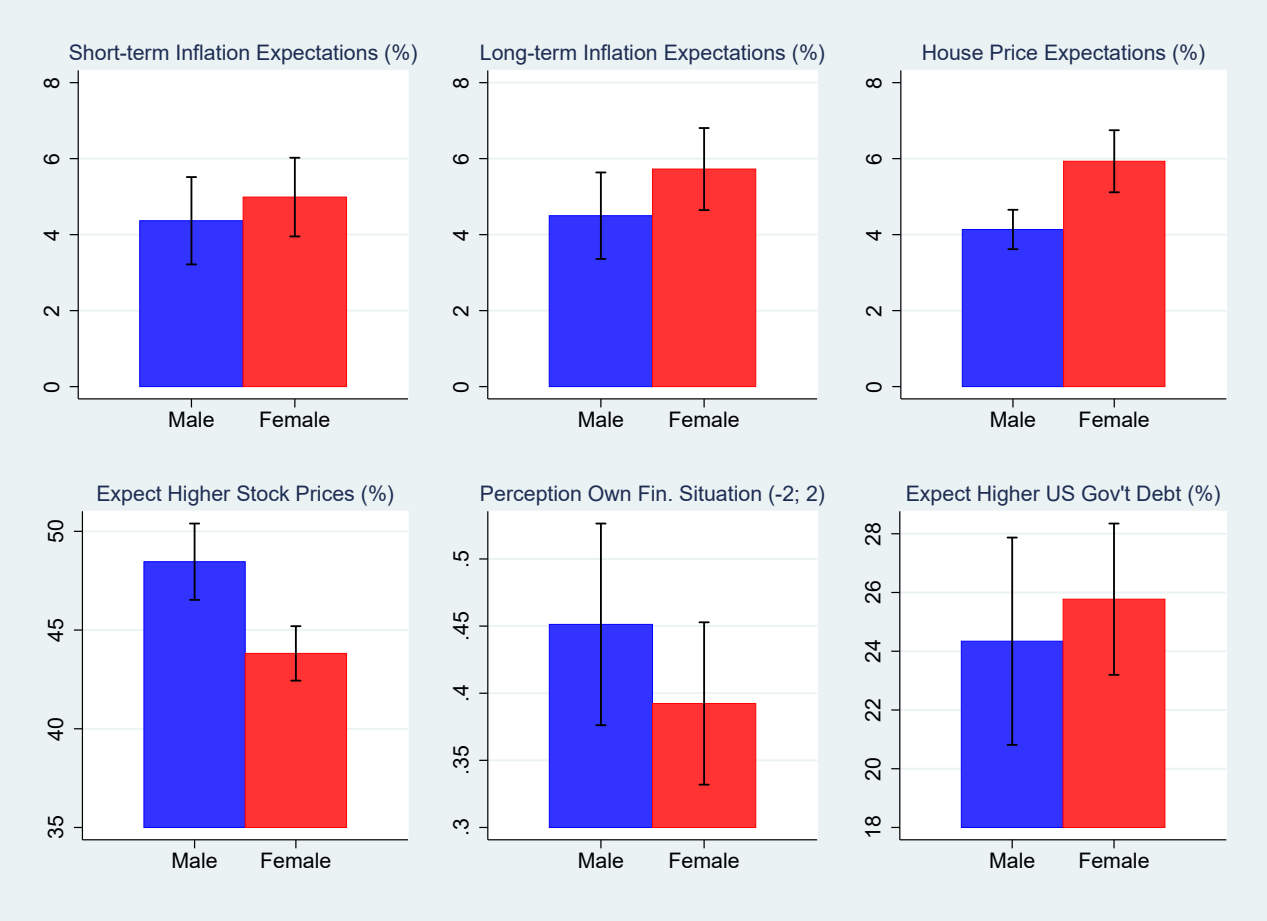
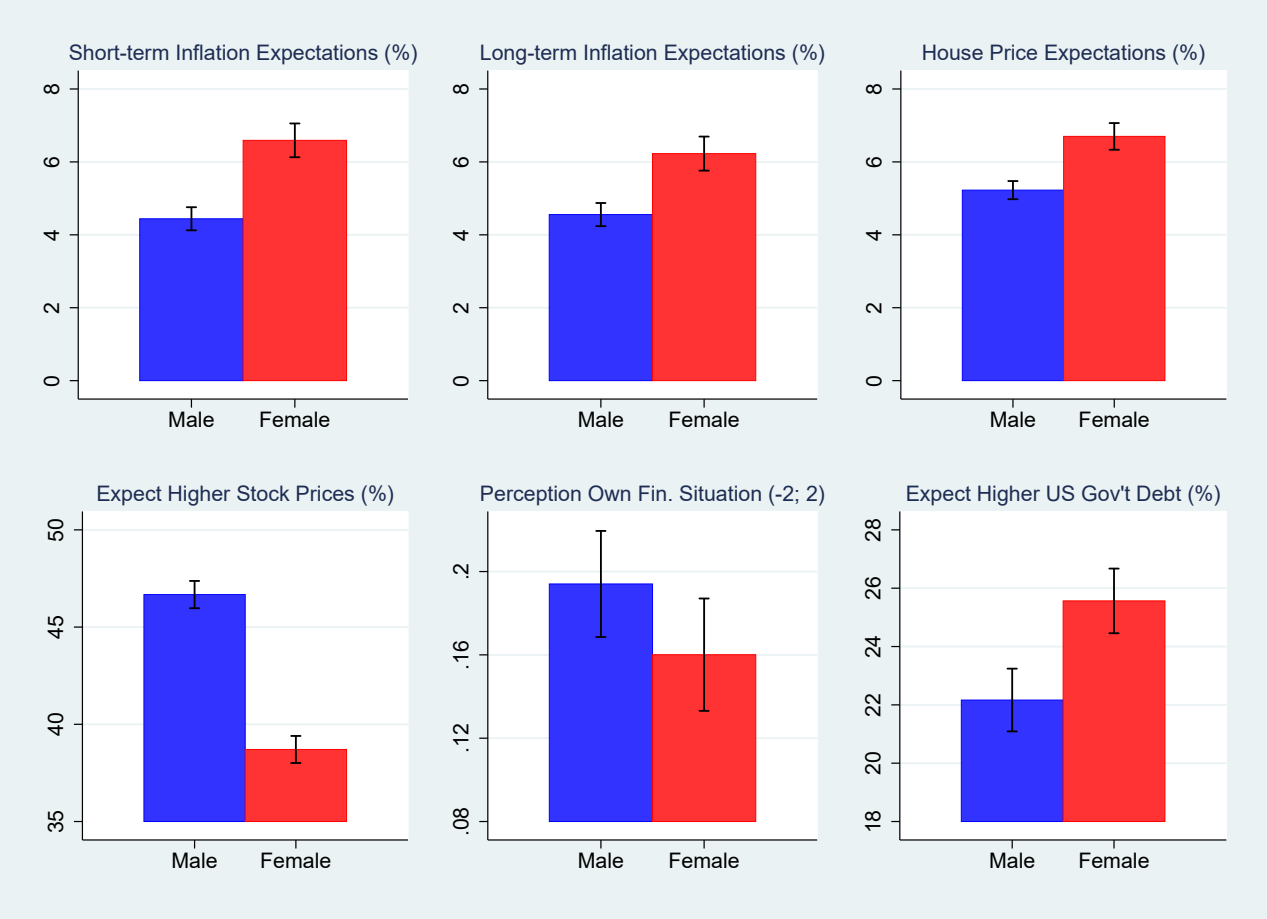
Not for Publication

Figure S.1: **Gender and Economic Expectations—Young (Below 25 Years Old)**



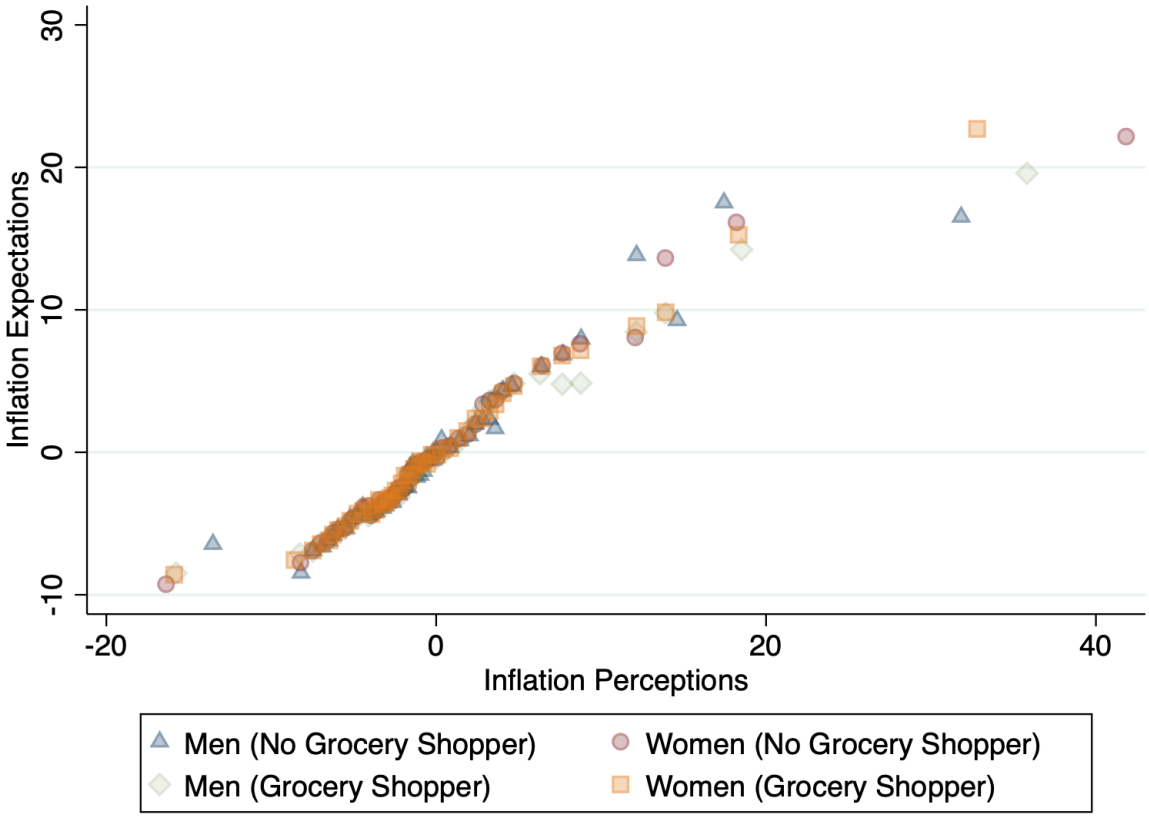
Notes. The bars in this figure report the estimated mean for men (blue, left bar) and women (red, right bar) of a set of numerical expectations elicited by the *New York Fed Survey of Consumer Expectations* (see [31]). The sample is restricted to respondents below 25 years of age. Black segments are 95% confidence intervals for a two-sided t-test for whether each estimated mean value equals zero.

Figure S.2: **Gender and Economic Expectations—Top 25% Equality Gender Norms**



Notes. The bars in this figure report the estimated mean for men (blue, left bar) and women (red, right bar) of a set of numerical expectations elicited by the *New York Fed Survey of Consumer Expectations* (see [31]). The sample is restricted to 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*. Black segments are 95% confidence intervals for a two-sided t-test for whether each estimated mean value equals zero.

Figure S.3: **Mapping of Perceptions into Expectations by Gender and Grocery Shopping**



Notes. Figure S.3 plots a binscatter plot mapping inflation perceptions into inflation expectations by gender and grocery-shopper behavior. Inflation perceptions were elicited in the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table S.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 S.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

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Table S.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 S.2: **Panel Sample Summary Statistics**

	Full Sample					Only High Quantitative Skills				
	Obs.	Mean	S.D.	Min	Max	Obs.	Mean	S.D.	Min	Max
Inflation Expectations (ST) (%)	40,568	5.45	13.33	-100	100	15,781	3.56	7.29	-80	100
Inflation Expectations (LT) (%)	40,568	5.45	13.38	-100	100	15,781	3.66	6.54	-100	100
House Price Expectations (%)	40,568	5.82	9.96	-100	100	15,781	4.51	5.82	-50	100
Likelihood Stock Prices Increase (%)	40,568	43.18	22.81	0	100	15,781	46.94	21.38	0	100
US Gov't Debt Expectations (%)	40,568	23.27	35.31	-100	100	15,781	20.51	33.71	-100	100
Perception Financial Situation	40,568	0.16	0.84	-2	2	15,781	0.23	0.81	-2	2
Grocery Expected Inflation (%)	40,568	20.11	34.24	-100	100	15,781	18.60	33.33	-25	100
Gas Expected Inflation (%)	40,568	20.96	34.96	-100	100	15,781	21.07	33.99	-100	100
Medical Expected Inflation (%)	40,568	25.04	34.08	-100	100	15,781	23.12	32.89	-100	100
Schooling Expected Inflation (%)	40,568	23.07	34.13	-100	100	15,781	20.95	33.05	-75	100
Rent Inflation Expectations (LT) (%)	40,568	21.78	33.96	-100	100	15,781	19.55	33.04	-25	100
Female	40,568	0.48	0.50	0	1	15,781	0.33	0.47	0	1
Age	40,568	50.59	15.20	4.2	96	15,781	50.94	15.31	18	91
Hispanic	40,568	0.08	0.27	0	1	15,781	0.06	0.24	0	1
Black	40,568	0.09	0.29	0	1	15,781	0.03	0.17	0	1
Asian	40,568	0.04	0.20	0	1	15,781	0.05	0.22	0	1
Some College	40,568	0.33	0.47	0	1	15,781	0.24	0.43	0	1
College Degree	40,568	0.32	0.47	0	1	15,781	0.40	0.49	0	1
Post-graduate Degree	40,568	0.24	0.43	0	1	15,781	0.32	0.47	0	1
Single	40,568	0.35	0.48	0	1	15,781	0.30	0.46	0	1
Employes	40,568	0.70	0.49	0	2	15,781	0.73	0.48	0	2
Income Group 1	40,568	0.35	0.48	0	1	15,781	0.35	0.48	0	1
Income Group 2	40,568	0.28	0.45	0	1	15,781	0.41	0.49	0	1
Income Group 3	40,568	0.36	0.48	0	1	15,781	0.24	0.43	0	1

Notes. Table S.2 reports summary statistics for the expectations, perceptions, and demographic characteristics of the respondents to the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table S.3: **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
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 S.3 reports estimated ordinary-least-squares coefficients and standard errors clustered at the individual level (in parentheses) for multivariate regressions of economic expectations and perceptions on the characteristics of respondents to the *New York Fed Survey of Consumer Expectations* (see [31]).

Table S.4: **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 S.4 reports estimated ordinary-least-squares coefficients and standard errors clustered at the individual level (in parentheses) for multivariate regressions of economic expectations and perceptions on the characteristics of respondents to the *New York Fed Survey of Consumer Expectations* (see [31]). 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 and described in Table S.1.

Table S.5: **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 S.5 reports estimated ordinary-least-squares coefficients and standard errors clustered at the individual level (in parentheses) for multivariate regressions of price expectations for specific categories of goods on the characteristics of respondents to the *New York Fed Survey of Consumer Expectations* (see [31]).

Table S.6: **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 S.6 reports estimated ordinary-least-squares coefficients and standard errors clustered at the individual level (in parentheses) for multivariate regressions of the variation of economic expectations and perceptions on the characteristics of respondents to the *New York Fed Survey of Consumer Expectations* (see [31]).

Table S.7: **Cross-sectional Sample Construction**

Restriction	*Surviving Observations*
Full Sample, *Chicago Booth Expectations and Attitudes Survey*, waves 1 & 2	91,289
Exclude households with only 1 respondent, either male or female	30,206
Exclude respondents 21 years old or below if anybody 40+ lives in the household	30,045
Exclude respondents within households that are neither a male nor a female head	20,888
Exclude observations for which demographic observables and expectations are not available	20,866
Final Working Sample	**20,866**

Notes. Table S.7 reports the steps we employed to construct our working sample applying a set of restrictions to the observations in the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table S.8: **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 S.8 reports estimated ordinary-least-squares coefficients and standard errors clustered at the household level (in parentheses) for multivariate regressions of inflation expectations on the characteristics of respondents to the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table S.9: **Inflation Expectations: Gender or Traditional Norms?**

	(1)	(2)	(3)	(4)	(5)	(6)
	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 S.9 reports estimated ordinary-least-squares coefficients and standard errors clustered at the household level (in parentheses) for multivariate regressions of inflation expectations on the characteristics of respondents to the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.

Table S.10: **Inflation Expectations and Inflation Perceptions**

	(1)	(2)	(3)	(4)
	Inflation Expectations			
Inflation Perception	0.659***	0.732***	0.424**	0.576***
	(9.08)	(13.41)	(2.04)	(4.71)
Female	-0.284	-0.474	-0.442	-0.721
	(-0.99)	(-1.35)	(-0.61)	(-0.87)
(Inflation Perception) × (Female)	-0.0515	-0.00537	0.116	0.178
	(-0.63)	(-0.05)	(0.54)	(0.69)
Grocery Shopper		0.555		0.928
		(1.60)		(1.21)
(Inflation Perception) × (Grocery Shopper)		-0.127		-0.220
		(-1.17)		(-0.91)
Demographics	X	X	X	X
Expectations	X	X	X	X
Household Fixed Effects			X	X
Obs.	10,188	10,188	10,188	10,188

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes. Table S.10 reports estimated ordinary-least-squares coefficients and t-statistics based on standard errors clustered at the household level (in parentheses) for multivariate regressions of inflation expectations on inflation perceptions and the characteristics of respondents to the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016.