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GENDER ROLES AND THE GENDER EXPECTATIONS GAP

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GENDER ROLES AND THE GENDER EXPECTATIONS GAP

Abstract

Expectations about economic variables vary systematically across genders. In the domain of inflation, women have systematically higher expectations than men. We argue that traditional gender roles are a significant factor in generating this gender expectations gap as they expose women and men to different economic signals in their daily lives. Using unique data on the participation of men and women in household grocery chores, their resulting exposure to price signals, and their inflation expectations, we document a tight link between the gender expectations gap and the distribution of grocery shopping duties. Since grocery prices are highly volatile, and consumers focus disproportionately on positive price changes, frequent exposure to grocery prices increases perceptions of current inflation and expectations of future inflation. We show that the gender expectations gap is largest in households whose female heads are solely responsible for grocery shopping, whereas no gap arises in households in which grocery shopping is split equally between men and women. We discuss how gender roles, through the gender expectations gap, can lead women to suboptimal economic choices.

JEL Classification: C90, D14, D84, E31, E52, G11

Keywords: Gender Gap, Expectations, Perceptions, Experiences, exposure

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Gender Roles and the Gender Expectations Gap*

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

April 28, 2020

Abstract

Expectations about economic variables vary systematically across genders. In the domain of inflation, women have systematically higher expectations than men. We argue that traditional gender roles are a significant factor in generating this gender expectations gap as they expose women and men to different economic signals in their daily lives. Using unique data on the participation of men and women in household grocery chores, their resulting exposure to price signals, and their inflation expectations, we document a tight link between the gender expectations gap and the distribution of grocery shopping duties. Since grocery prices are highly volatile, and consumers focus disproportionately on positive price changes, frequent exposure to grocery prices increases perceptions of current inflation and expectations of future inflation. We show that the gender expectations gap is largest in households whose female heads are solely responsible for grocery shopping, whereas no gap arises in households in which grocery shopping is split equally between men and women. We discuss how gender roles, through the gender expectations gap, can lead women to suboptimal 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, and it might hamper the effectiveness of economic policies that aim to manage households’ expectations in times of crisis (Bernanke, 2010). Earlier research shows that distorted beliefs about economic variables might also 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 expectations gap.

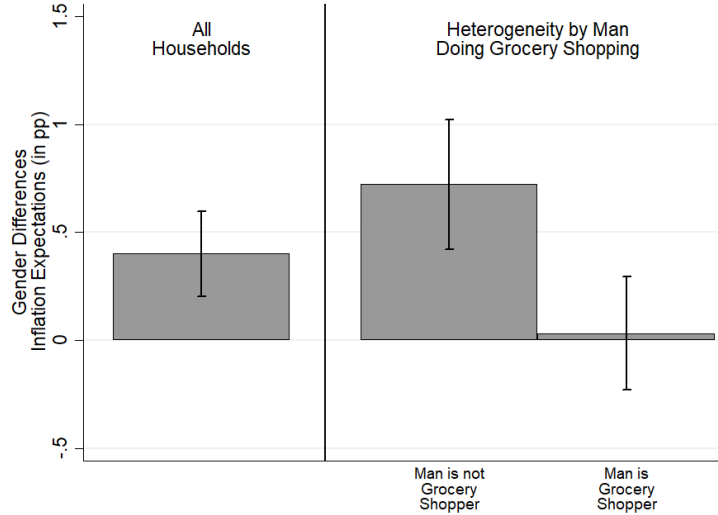
In this paper, we assess the role of traditional gender roles as a determinant of the gender expectations gap. Gender roles induce women and men to engage in different activities and to select into different environments in their daily lives. As a result, women and men have different experiences and 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 (Core CPI) excludes food (and energy) to better identify inflation trends (Evans and Fisher, 2011). We also know that consumers focus

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 the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. The mid and right bars split the sample 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.

disproportionately on price increases rather than decreases (Cavallo et al., 2017; Ranyard et al., 2008; Bates and Gabor, 1986; D’Acunto et al., 2020). As a result, women’s exposure to volatile price changes can generate an 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 a representative US sample’s participation in their household’s grocery chores and their exposure to grocery-price signals (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

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

shown in the left panel of Figure 1, the raw data indicates that women have significantly 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 drive the gender gap in inflation expectations fully (cf. middle bar of Figure 1). In households in which spouses share grocery shopping chores 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—the equality between the nominal interest rate and the sum of real interest rate and expected inflation—this upward bias implies that women perceive real interest rates to be lower than men, because nominal interest rates are the same for everybody. Because nominal rates in the US economy were below 1.5% over recent years, the magnitudes we estimate imply that women’s perceived real rates were up to 33% lower than men’s. Lower perceived real interest rates, in turn, increase consumers’ willingness to spend,⁴ which might lead women to overconsume and undersave relative to 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 determinants of economic expectations. The results are also similar when we partial out income, education levels, and other demographics, such as unemployment status or ethnicity, which influence uncertainty in individual inflation expectations. Crucially, as we saw in the raw data, no gender difference exists once we restrict the analysis to households where both men and women participate in the grocery shopping.

To corroborate our interpretation that exposure to different price signals due to gender roles drives the gender expectations gap, rather than innate cognitive differences

⁴This result is known as the consumer Euler equation, and relates consumption growth to real interest rates: Lower perceived real rates reduce the propensity to save and increase the propensity to spend.

across genders, we also show that the process of mapping perceptions of current inflation to expectations of future inflation is virtually identical for men and women, whether or not they participate in grocery chores. What differs across genders is the perception of current inflation, which is higher for women when women are the sole grocery shoppers in their households. Women have thus higher inflation expectations, on average, because their perceptions of inflation are higher, and not because men and women have similar inflation perceptions and women expect higher inflation.

In the last part of the paper, we corroborate the external validity of our results in the *New York Fed Survey of Consumer Expectations* (SCE), a data set that is commonly used in economics research and in whose construction we were not involved. We first replicate our baseline results on the gender expectations gap over both a short-term and long-term horizon. The second step—linking the gender expectations gap to grocery price exposure—is harder to replicate directly as the SCE lacks data on individuals’ contribution to grocery chores. As an indirect approach, we consider two subsamples. The first subsample are respondents from areas where a high share of men participates in their households’ grocery according to 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.

Finally, the longer time series of the SCE data allows us to compute individual-level measures of volatility and uncertainty of inflation expectations. We find that both are higher among women, which is consistent with our proposed mechanism: Women are more exposed to volatile signals about prices through 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 beliefs about economic variables across genders. That is, traditional gender roles can shape beliefs not only in contexts that have been singled out as “gendered,” such as beliefs about women’s abilities in STEM disciplines or in leadership roles. Even in realms that have no gender connotation, such as expectations about economic variables like inflation, differential exposure to signals in daily life due to 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 aggregate and the individual level. At the aggregate level, inflation expectations are central to the effectiveness of economic policy (Bernanke, 2010), especially as low interest rates are becoming the norm in most industrialized countries, including the United States since the 2008 financial crisis and again during the COVID-19 crisis (Summers, 2018). In such times, policies that aim to stabilize business cycles and to avoid prolonged economic crises need to manage consumers' inflation expectations. But expectations cannot be managed using the same policies for men and women because of the gender expectations gap.

At the micro level, distorted inflation expectations can be detrimental to individual economic outcomes. Consumers who expect higher prices might distort their consumption choices, not accumulate enough savings for retirement, and make suboptimal real-estate investments. Thus, the gender expectations gap can 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-connotated tasks, and outcomes that possess a gender-specific connotation. Our findings suggest that, even beyond decisions that are stereotypically gendered, seemingly innocuous differences in women's daily exposures to prices can have significant consequences for perceptions and expectations. The evidence in our paper highlights a relationship between gender roles and non-gendered beliefs and outcomes, which is subtle and hard to reduce through traditional policy interventions.

II Survey Data

We utilize a novel source of data, the CBEAS, which we fielded online in two waves in June 2015 and June 2016. We invited all members of the Kilts-Nielsen Consumer Panel (KNCP) to participate, approximately 40,000-60,000 households per wave. KNCP reports both static demographics, such as household size, income, ZIP code of residence, and marital status, and dynamic features of participants' grocery purchases, such as categorizations of the products purchased, information on the shopping outlets, and the per-unit price paid for each item. The prices are collected electronically through scanning 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 an annual retention rate of more than 80%.

In the CBEAS, we elicit for all household members the numerical inflation expectations over the next 12 months and the perceptions of current inflation. 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 do so only in 908 households (12%),⁵ and another household member in the remaining 1,803 households (22%). Other household members

⁵A two-sided t-test for whether the shares of grocery shoppers are equal across genders rejects the null hypothesis at standard levels of significance ($p < 0.01$).

who report being the main grocery shopper are typically female individuals whose age is higher than the age of both male and female heads, and who do not enter our analysis.

In our complementary analysis, we use SCE data from June 2013 to April 2018 to study the gender expectations gap for a longer period than available through the KNCP waves. The SCE has become a key survey tool to study the effectiveness of monetary policy in the US.⁶ 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 (40,568 individual-month observations). The number of unique individuals in this 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 predict the extent of the gender expectations gap. As women undertake the majority of grocery shopping duties for their households, they 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., 2020).

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

⁶Armantier et al. (2017) provide a detailed overview of the survey design, the sample construction, and summary statistics of the SCE.

gender differences between the two samples rejects the null at $p < 0.01$.⁷

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 elicited 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 Table 1 provides the same insight, including the disappearance of gender differences after controlling for grocery-price exposure. Columns

⁷The pattern 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 ($p < 0.01$).

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 suggest that innate (or otherwise induced) gender-specific variation can barely 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 2, the sign of the coefficient estimate for female heads becomes negative, though insignificant, when we restrict the sample to females who do not participate in grocery shopping. 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 (column 2).⁸ 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

⁸This subsample also reveals that our main results hold irrespective of whether the main grocery shopper is the female head, the male head, or a third household member.

dummy is insignificant and the interaction effect significantly positive.⁹ Hence, intrinsic characteristics related to gender are unlikely to drive the gender expectations gap; instead, participation in grocery shopping predicts inflation expectations independent of gender.

Columns 4-6 of Table 2 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 in which the female head is a homemaker (columns 5), relative to households in which the female head is employed in the formal labor market (column 4). The difference 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.

In Figure 3, we provide 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 maps 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

⁹Note that the non-interacted subsample indicator is absorbed by the household fixed effect, because it has the same value for both female head and male head within the household.

correlation between perceptions and expectations. Moreover, this correlation does not vary systematically across genders as the plots for males and females overlap tightly.

Panel B of Figure 4 shows that the tight mapping holds independent of males' and females' participation into grocery-shopping: The mapping between inflation perceptions and expectations is very similar whether we focus on men or women who do or do not go grocery shopping. The latter findings rule out that selection distorts the mapping between perceptions and expectations.

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 inflation perceptions with the gender dummy (-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 Replication

In the last step, we corroborate the external validity of our results using a different dataset, the New York Fed SCE, which is commonly used in economics research and in whose construction we had no role. We cannot construct the same gender-role proxy in the SCE as in the CBEAS since the CBEAS data is unique in containing both expectations data and participation in grocery chores, even within households. To provide indirect evidence 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 result holds for any type of inflation measure.

We also use the SCE to assess the robustness of our results when controlling for individual characteristics we do not observe in the CBEAS, such as numeracy and financial skills. We confirm our results when partialling out these characteristics in the full sample as well as when restricting the analysis only to respondents who answer correctly to all the questions about numeracy, probability literacy, and financial literacy in the SCE (see Online-Appendix Table A.2 which reports coefficients from standardized regressions to ensure comparability across columns). These results show that potential systematic differences in numeracy, probability literacy, or financial literacy across genders cannot explain the gender expectations gap.

Moreover, because the SCE includes the elicitation of inflation expectations for different price categories, we can also verify that the gender expectations gap exists for inflation about all available price categories, which include gas prices, medical prices, schooling prices, and housing rents (see Online-Appendix Table A.3).

Finally, because the SCE has a panel component in which we observe several inflation-expectations elicitation within respondent, we can compute measures of uncertainty and volatility of expectations within individual, which is impossible in the CBEAS that only includes two waves. We find that women’s inflation expectations are more uncertain and volatile than men’s (see Online-Appendix Table A.4), which is consistent with the mechanism we propose for the effect of gender roles in the gender expectations gap.

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.

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, a phenomenon that has been accelerated during the COVID-19 crisis. 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.

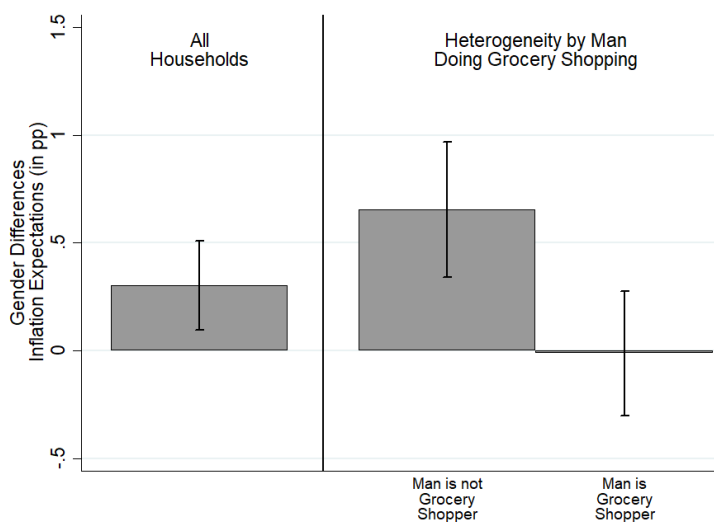
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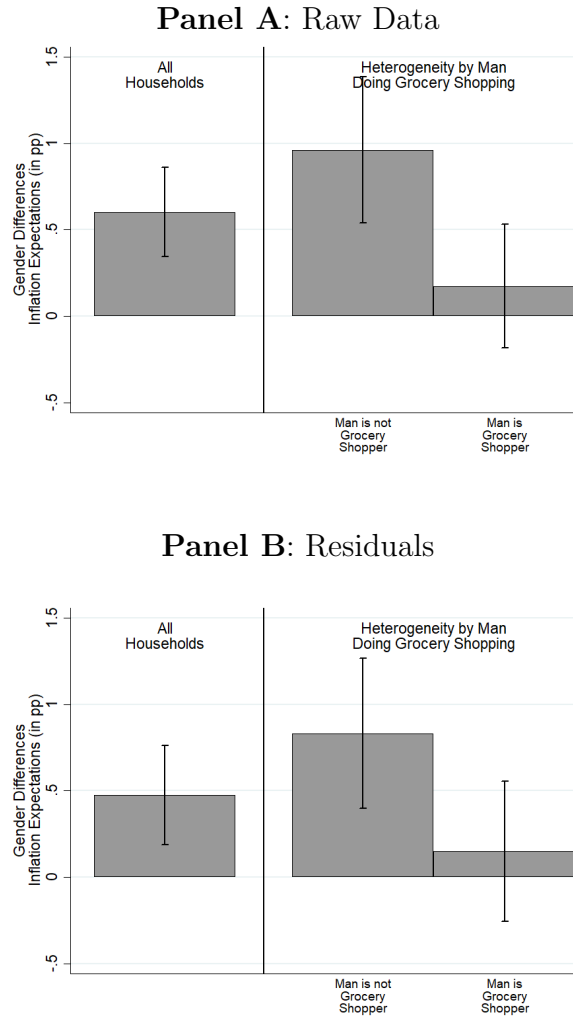
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Figure 2: Gender Expectations Gap Within Households: Residuals



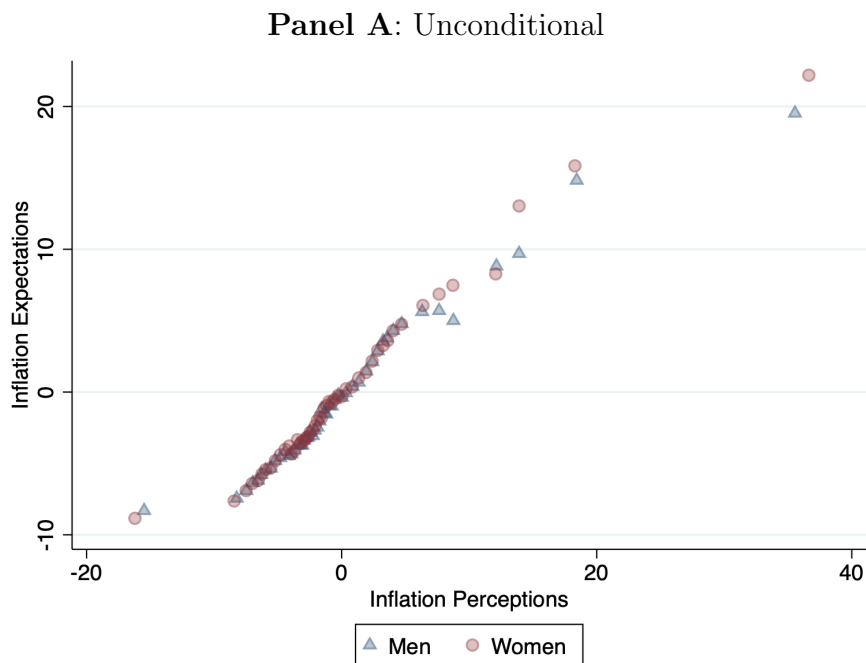
Notes. The leftmost bar of Figure 2 plots the average differences in the inflation expectations of women and men within all households headed by heterosexual couples in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016, conditional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



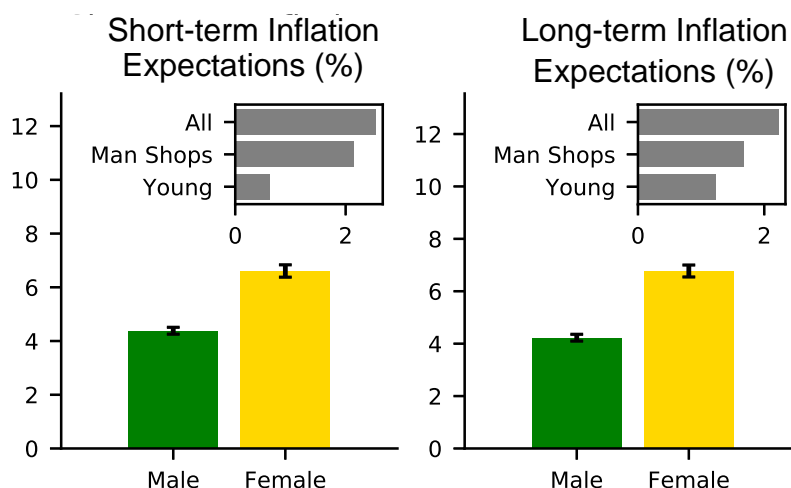
Notes. The leftmost bar of Figure 3 Panel A plots the average differences in the inflation perceptions of women and men for all households in our sample based on the customized *Chicago Booth Expectations and Attitudes Survey*, which we fielded in June of 2015 and 2016. The two bars on the right propose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



Notes. The vertical bars in Figure 5 report the estimated mean for men (green, left bar) and women (yellow, right bar) of short-run and long-run inflation 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.

Table 1: 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

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

Notes. Table 1 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 2: 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

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

Notes. Table 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. 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.

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

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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

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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: Gender Gap in Inflation Expectations: Replication in the New York Survey of Consumer Expectations, Multivariate Analysis (standardized)

	(1)	(2)	(3)	(4)
	Full Sample		Only Math, Finance Literate	
	Short-Term Inflation	Long-Term Inflation	Short-Term Inflation	Long-Term Inflation
<i>St. dev.</i>	<i>13.2 pp</i>	<i>13.3 pp</i>	<i>6.9 pp</i>	<i>6.2 pp</i>
<i>Median</i>	<i>3 pp</i>	<i>3 pp</i>	<i>3 pp</i>	<i>3 pp</i>
Female	0.08*** (0.01)	0.04*** (0.02)	0.10*** (0.03)	0.06** (0.03)
Age	0.00** (0.00)	0.00 (0.00)	0.00*** (0.00)	0.00*** (0.00)
Hispanic	0.01 (0.03)	0.02 (0.03)	0.14*** (0.04)	0.20*** (0.04)
Black	0.21*** (0.04)	0.25*** (0.04)	0.18** (0.08)	0.22** (0.11)
Asian	0.04 (0.04)	0.05 (0.04)	0.23*** (0.07)	0.27*** (0.09)
Some College	0.03 (0.04)	0.04 (0.04)	0.04 (0.09)	0.05 (0.08)
College	-0.03 (0.04)	-0.04 (0.03)	-0.00 (0.09)	-0.02 (0.08)
Postgraduate	-0.03 (0.03)	-0.02 (0.04)	0.01 (0.09)	-0.00 (0.08)
Single	0.01 (0.02)	0.03 (0.02)	0.00 (0.03)	-0.01 (0.03)
Employed	-0.01 (0.02)	-0.02 (0.02)	-0.00 (0.03)	-0.02 (0.03)
Income Group 1	0.01 (0.02)	0.01 (0.02)	-0.07* (0.04)	-0.09** (0.04)
Income Group 3	0.074*** (0.02)	0.053*** (0.02)	0.10*** (0.02)	-0.10*** (0.03)
Confidence	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)	0.01*** (0.00)
Numeracy 1	-0.01 (0.07)	-0.06 (0.07)		
Numeracy 2	-0.07*** (0.02)	-0.07*** (0.02)		
Probability 1	-0.08*** (0.03)	-0.08*** (0.03)		
Probability 2	-0.01 (0.04)	-0.06 (0.04)		
Probability 3	0.01 (0.03)	-0.00 (0.03)		
Financial Literacy 1	0.03 (0.03)	0.03 (0.04)		
Financial Literacy 2	-0.11** (0.05)	-0.11** (0.05)		
Constant	-0.08 (0.11)	0.08 (0.11)	-0.26*** (0.10)	-0.24** (0.10)
R ²	0.07	0.06	0.05	0.07
Obs.	39,645	39,645	15,639	15,639

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

Notes. Table A.2 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. Columns (3) and (4) limit the sample to respondents who provide correct answers to the survey questions labeled Numeracy 1, Numeracy 2, Probability 1, Probability 2, Probability 3, Financial Literacy 1, Financial Literacy 2. The sample period is from June 2013 to April 2018.

Table A.3: **Gender Gap in Inflation Expectations: Price Categories (standardized)**

	(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

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

Notes. Table A.3 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 defined in Table A.1. The sample period is from June 2013 to April 2018.

Table A.4: 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

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

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*. 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.