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Abstract

Using 24 million appraisals for refinance mortgages over the January 2013 to March 2024 period and comparing homes in the same census tract and year-quarter, we find that homes of single female households are appraised for 2.4% less than those of single men. Appraisers make lower adjustments to comparable properties and give worse house condition ratings for single female homes. The gap is less pronounced when borrowers have unisex names and when appraisers have greater exposure to single female homeowners. The lower appraisal values of single female households are associated with higher interest rates, lower loan amounts and lower cash-out amounts in the refinancing. Our findings indicate that the gap in appraisals may be one reason for (female) homeowners' sluggish refinancing activity and the gap in household wealth.

Keywords: the male and female gap · home appraisals · mortgage refinance

JEL Classification: G21 · J16

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1. Introduction

Housing is a significant portion of household wealth. Whether or when to refinance a mortgage is among the important financial decisions to make for a household. Several studies document that, despite large potential savings, many households fail to refinance (Keys, Pope and Pope (2016) and Agarwal, Rosen and Yao (2016) among others). The low refinancing rates can be partly explained by the complexity of the refinancing decision, lack of trust (Johnson, Meier and Toubia (2019)), financial illiteracy (Bajo and Barbi (2018)) and inattention and psychological costs (Andersen et al. (2020)). In this paper, we examine another friction for the low refinancing rate: the male and female gap in appraisal values.

Lenders require a house appraisal prior to refinancing to ascertain the home's current value, which, along with the loan amount, determines the homeowner's equity and the loan-to-value ratio (LTV).[1] Low appraisal values lead to higher LTVs, which can increase the likelihood that the loan will be rejected, require the homeowner to purchase private mortgage insurance (PMI), and make the terms of the refinancing, if it happens, less attractive, such as by increasing interest rates. The male and female gap, whereby single female homeowners receive lower appraisal values, may keep these homeowners from fully and optimally exploiting profits associated with refinancing opportunities.

We use the proprietary version of the new Uniform Appraisal Dataset (UAD) available at the Federal Housing Finance Agency (FHFA), which contains standardized industry appraisal information. We use all appraisals for refinance mortgages from January 2013, the start of the data, to March 2024. The UAD contains detailed data on property characteristics, names of homeowners and details of appraisals. We use name datasets to characterize homeowners as single female, single male or couples. The share of single female homeowners is increasing somewhat over the sample period from around 18% in the beginning of the sample period to over 24% at the end, with a dip in 2020 (Figure 1).

[1] Homeowner equity is the current value of the house minus the outstanding mortgage balance.

Across 24 million appraisals for single-family houses, we find that single female homeowners receive significantly lower appraisal values relative to single male homeowners. The lower appraisal values persist, though are lower in magnitude, when we include detailed controls for property characteristics. The lower appraisal values for single female homeowners are also robust to the inclusion of granular year-quarter-tract fixed effects. Overall, our baseline results show that homes of single female borrowers are appraised to be 2.4% lower than similar homes of single male borrowers in the same census tract in the same year and quarter. For the average appraisal, this is a reduction of $11,184 in house value. We do not find any evidence that the estimated gap declines over the sample period. Homes of couples are appraised to be higher than similar homes of single males in the same tract and in the same year-quarter.

The UAD data contains details of the appraisal report, and we consider how the difference in appraisal values could be attributable to parts of the report that require evaluative judgments by the appraiser. Appraisers are required to choose appropriate comparable properties to help determine the value, and they make adjustments to the prices of these comparable properties to account for differences with the assigned property. We find that the net adjustments to comparable properties are negative for homes of single females relative to the homes of single males, which means that appraisers are more likely to reduce the value of the assigned property relative to the selected comparable houses if the assigned property is owned by a single female rather than a single male. We also find that homes of single females receive worse ratings for the condition of the property as well as worse ratings for construction quality. Homes of single females are also less likely to be marked as having had an upgrade. Overall, in all categories of evaluative judgements, homes of single females fare worse, which aligns with their overall lower appraisal values.

The worse ratings of single females with respect to evaluative fields, which are relatively subjective, motivates the question: to what extent do they reflect accurate judgments strictly about the property versus perceptions, perhaps influenced by generalizations, about women as homeowners. We investigate this by examining factors that have the potential to impact appraisers' views on female homeownership.

We start by considering the name of the borrower. We link a subset of the UAD to a dataset of mortgages acquired by the government-sponsored enterprises (GSEs), which provides administrative data on borrower sex. We show that the difference in appraisal values shrinks by around half when restricting to cases where it is not easy to infer the borrower's sex based on the first name in the UAD. We also show that the gap is less pronounced for relatively more ambiguous names even within our baseline UAD sample. The results suggest that appraisal values are influenced by the ease of inferring the homeowner's sex.

We also consider characteristics of the appraiser. Several studies provide evidence that female agents are associated with better outcomes for females because of within-group affinity or soft information that allows them to make better assessments (see Egan, Matvos and Seru (2022), Cornaggia and Xia (2023), and Bose, Filomeni and Tabacoo (2024)). Consistent with this view, we find that the female-male gap is reduced by around 4% when the appraiser is a female. Additionally, we find that greater exposure to single female homeowners in the appraiser's recent history is associated with a smaller gap, suggesting that appraisal values are affected by the degree of knowledge about female homeownership and could be mitigated through interactions and experience.

We next examine how the appraisal value gap varies with factors that could affect the appraisal procedure. We consider the role of FinTech lenders, which use a mostly online application process and are known for their rapid application processing speeds and agile adjustment to changing mortgage demand volumes (Fuster et al. (2019)). While the lender is limited from influencing the appraisal directly, it can still influence the appraisal indirectly since it usually selects the appraiser. We then hypothesize that appraisals associated with mortgages originated by FinTech lenders could rely relatively more on appraisers that use standardized inputs to better align with their speed and scalability. More generally, several studies suggest that demographic differences in financial outcomes can vary based on procedures and technology used (see D'Acunto, Ghosh and Rossi (2024) and Bartlett et al. (2022)). Consistent with this hypothesis, we find that a larger fraction of FinTech lenders in a neighborhood is associated with a smaller gap. In addition, we also find that the gap is lower for "hybrid" appraisals in which a

third party visits the home while the appraiser determines the property value without encountering the homeowner.

In addition to the transaction participants and appraisal procedure, we also consider local market characteristics. Consistent with the mentioned evidence about the importance of appraisers' experience with single female homeowners, we find that a larger fraction of female homeowners in a neighborhood reduces the estimated gap. We also find that the gap is lower during busy times when there are more house transactions, which could be due to either more streamlined procedures and standardized inputs to catch up with higher transaction volumes or more available comparable properties that could be used to more precisely derive appraisal values. We also find that the gap is higher in poorer neighborhoods.

Lastly, we examine the impact of a lower appraised value on the terms of the associated refinance loan. As discussed previously, we find that appraised values are associated with a higher LTV ratios and higher interest rates. Our estimates imply that single females pay 0.38% higher interest rates and receive loans that are 1.89% less on account of the lower appraised values. Cash-out amounts for single female homeowners are also 1.71% lower due to the lower appraised values. These results suggest that the lower appraised values for single female owners adversely impact the refinancing terms they are able to obtain.

Not being able to refinance or obtaining worse refinancing terms is costly to single female homeowners and could hinder their ability to accumulate wealth. The male and female gap in housing appraisals also reduces the efficacy of monetary policy transmission. Prior literature has documented several factors that account for the heterogeneity of pass-through of monetary policy through the mortgage channel. In our paper we document another friction, namely lower appraisal values, that reduces the likelihood of single female homeowners successfully or fully benefiting from refinancing.

The paper is related to the literature on refinancing frictions. Several papers document that borrower's refinancing decisions are suboptimal, with many homeowners failing to refinance (Keys, Pope and Pope (2016) and Agarwal, Rosen and Yao (2016)), even with zero upfront closing costs (Johnson, Meier and Toubia (2019)). Other studies show that the low

refinancing rates can be partly explained by the complexity of the refinancing decision, lack of trust (Johnson, Meier and Toubia (2019)), inattention and psychological costs (Andersen et al. (2020)) and employment documentation costs (DeFusco and Mondragon (2020)).[2] Bajo and Barbi (2018) find in the Italian market that financial illiteracy contributes to sluggish refinancing after policy changes that substantially reduce the cost of refinancing. They also document that this sluggish refinancing is more likely to be seen for women on account of lower financial sophistication. Our results document that sluggish refinancing among women may arise from lower appraisal values that make refinancing terms less attractive for them.

The above studies focus on the demand side to explain the suboptimal refinancing behavior. In contrast, our paper provides a possible explanation for the refinancing gap focusing on a supply-side factor that arises from the appraisal gap. We contribute to a growing literature that documents the role of supply side factors in refinancing. Frazier and Goodstein (2023) document the presence of capacity constraints for mortgage sellers, while Fuster et al. (2019) document that a growing share of FinTech lenders has helped in easing these constraints.

The paper is also related to the literature that documents differences in financial outcomes by sex. Goldsmith-Pinkham and Shue (2023) document that there is a 1.5% gap in annualized returns on housing (also see Kim et al. (2019)). There is large and growing literature that documents male and female gaps in wages (Blau and Kahn (2006)), new firm financing (Coleman and Robb (2009)), VC financing (Ewens and Townsend (2020)), financial advice (Bhattacharya et al. (2023)), promotions (Huang, Mayer and Miller (2024)) and within-firm capital allocations (Duchin, Simutin and Sosyura (2021)), among others. Our paper is also broadly related to a literature on demographic variation in the mortgage market. Gerardi, Willen and Zhang (2023) and Howell and Korver-Glenn (2018) document persistent differences between Black and White borrowers in the refinancing market, while Grodzicki et al. (2024) find higher rates of low appraisals in majority Black neighborhoods.

[2] Several recent papers document differences in demand and supply factors during the pandemic. Agarwal et al. (2023) document a refinancing gap between low- and high-income groups during the pandemic that is related to local economic conditions. Fuster et al. (2024) document increase in intermediation markups during the pandemic.

The rest of the paper proceeds as follows. In Section 2 we describe the data; in Section 3 we present our main results; in Section 4 we examine appraiser, local market and other characteristics that impact the estimated gap; in Section 5 we examine the impact on refinancing terms, and finally in Section 6 we conclude.

2. Data Description

We primarily use the Uniform Appraisal Dataset (UAD). The UAD is a proprietary dataset available at the Federal Housing Finance Agency (FHFA) that consists of information provided by appraisers to Fannie Mae and Freddie Mac (the government-sponsored enterprises, or GSEs) via the Uniform Residential Appraisal Report (URAR).[3] The UAD includes traditional appraisals for one-unit single-family homes associated with mortgages backed by the GSEs. It also contains appraisals that were submitted to the GSEs but were not ultimately associated with a GSE mortgage, including cases where a non-GSE loan was originated or where no loan was originated. We focus on appraisals for refinances from January 2013, the start of the UAD data, through March 2024, which includes about 24 million records.[4]

The UAD has a unique combination of features that make it especially valuable for studying the male and female gap in appraisals. For one, it includes the names of the homeowner and the appraiser, which we use to infer sex. It also contains detailed house characteristics, including unique information about condition, quality, and recent updates in addition to standard hedonic characteristics like square footage, number of rooms, and property amenities. It also includes information about how the appraiser adjusted the selected comparable properties to value the assigned property. As seen in Table 1, single female (male) borrowers are about 20% (37%) of the entire sample, and the rest are couple borrowers. The mean appraisal value is around $466 thousand.

[3] The UAD has been studied in recent work by Grodzicki et al. (2024) and Doerner and Susin (2024). To our knowledge, there are no previous research papers that use this data to study male and female gaps.
[4] The UAD also contains appraisals for house purchases. The appraisals for purchase loans are similar to those of refinances except that they benefit from having a contract price. Eriksen et al. (2018) report that 92.1% of the appraisals for purchases are at or above the contract price in GSE loans over the period 2013 to 2017. Focusing on refinancing appraisals allows us to examine the appraisal process without any influence by a market contract price.

2.1 UAD-MLIS Merged Data

For parts of the analysis, we also use data from the Mortgage Loan Information System (MLIS), which is a proprietary dataset at the FHFA for loans backed by the GSEs. We link appraisals in UAD that were ultimately associated with a GSE loan to the corresponding loan in MLIS using a precise merge. We use the linked data to examine the effects of appraisals on loan terms, such as interest rates, amount of equity extracted in cash-out refinances, and loan amounts. We also use the MLIS data as an alternative source on borrower sex information, and to examine hybrid appraisals which are not available in the UAD data. We discuss these uses in detail in the corresponding sections. The merged UAD-MLIS data contains around 17 million observations, as seen in Table 2. The mean appraisal value in the merged UAD-MLIS data is somewhat lower than that in the full UAD data.

2.2 Homeowner Sex Classification

We infer sex from the first name of the homeowners. We identify the homeowners based on the borrowers for the associated refinance loan.[5] We use GenderChecker to characterize homeowners as male or female (see Egan, Matvos and Seru (2022)). GenderChecker associates a sex to a first name if the probability that the name is of the sex exceeds 99%. We supplement it with data from Namsor that provides a probability that a first name is female or male and use a cutoff of 95% to assign a first name to a sex. Homeowners whose name could not be associated with a sex or who only report last names were excluded from the analysis. This restriction reduces the sample by 9.5%. We then characterize homeowners as couples, single female or single male.[6] About 20% of the sample properties are classified as belonging to single female homeowners, around 37% as single males and the remainder, about 43%, as belonging to couples. As Figure 1 illustrates, that the share of single female homeowners increased over the sample period from around 18% in 2013 to just above 24% in 2024.

3. Main results

[5] Note that there may be some measurement error due to, for example, non-borrowing spouses.
[6] Homeowners were classified as single female (male) if there was a single borrower that is a female (male). The remaining homeowners were classified as a couple.

In this section, we describe the baseline model and results. The dependent variable is the natural log of the appraised value and is referred to as *Log (Appraisal Value)*. The variable of interest is an indicator variable *Single Female*, which takes the value of one if the homeowner is a single female. We also create an indicator variable *Couple* if the homeowners are a couple. In our first specification, we include *Single Female* and *Couple* along with year-quarter fixed effects and with the standard errors clustered at the county level. The omitted category is single male homeowners. As seen in Column 1 of Table 3, the estimated coefficient for *Single Female* is negative and highly significant while that of *Couple* is positive and significant. That is, appraisal values for *Single Female* (*Couple*) homeowners are lower (higher) than the appraisal values for single male homeowners in the same year-quarter.

In Column 2 of Table 3, we control for property characteristics. As discussed above, an advantage of the UAD is the detailed data on property characteristics. Specifically, we include an indicator for whether the house had a fireplace, a pool, a garage, and a A/C unit along with natural log of the gross living area (GLA). We also include the number of bedrooms, number of bathrooms, number of stories and the year the house was built as controls. We continue to include year-quarter fixed effects and cluster the errors at the county level. Not surprisingly, the inclusion of property characteristics increases the fit of the model significantly. The estimated coefficients for both *Single Female* and *Couple* reduce in magnitude, as some of the differences in appraisal values are on account of different house characteristics, but they continue to be highly significant.[7] The coefficient estimate suggests that, controlling for property characteristics, appraisals for homes owned by single females are 5.1% lower than that for single male owners.

In Column 3 of Table 3, we replace some property characteristics with indicator variables. For example, we replace the number of bedrooms with indicators for each unique value for the number of bedrooms. Similarly, the number of bathrooms, number of stories and year built are replace by indicator variables for their respective unique values. Use of indicator

[7] The property characteristics are correlated, making the interpretation of individual coefficients difficult. For example, with the inclusion of gross living area (GLA), the number of bedrooms proxies for the size of the bedrooms, resulting in a negative sign.

variables is referred to as *Granular Controls* and specified at the bottom of the column. This improves the fit of the model and does not materially impact the estimated coefficients for *Single Female* or *Couple*.

In Column 4 of Table 3, we keep the granular control variables and additionally include year-quarter-county fixed effects. With these fixed effects, the coefficient on *Single Female* captures the difference in the appraisal value for homes of single females and similar homes of single males in the same county and year-quarter. The estimated coefficient on *Single Female* continues to be negative and significant. Finally, in Column 5 of Table 3 we estimate the most restrictive specification where we include year-quarter-tract fixed effects to conduct a "within-census tract" test that compares properties in the same census tract and same year-quarter. As tracts are smaller than counties, this allows for a stronger control for the quality of the neighborhood and its amenities. The estimated coefficient on both *Single Female* and *Couple* are smaller, indicating that some of the differences in appraisals are due to differences in neighborhood. However, even with this granular set of fixed effects, the coefficient on *Single Female* continues to be negative and significant. As we control for neighborhood and the quarter of the appraisal, the lower appraisal values for single female owners are unlikely to be entirely explained by changes in local market conditions, or by differences in geographical factors or property characteristics between single female and single male borrowers.

Our baseline coefficient estimate implies that appraisals for single females are 2.4% lower than similar houses owned by single males in the same tract in the same year and quarter. As the average unconditional value of the house is about $466 thousand, this implies a $11,184 reduction in the appraisal value of a similar house in the same neighborhood and the same year-quarter. Note that this model, with granular controls for property characteristics, year-quarter-tract fixed effects and standard errors clustered at the county level, is the base model for later tables unless specified otherwise. Overall, our baseline analysis reveals a significant male and female gap in home appraisal values. We do not find any decline in the male and female gap over time as seen in Figure 2 that plots the change in the estimated coefficient of *Single Female* over the sample period.

Another potential factor that could in principle contribute to the lower appraisal values for single females is that they could be more likely to be appraised by relatively conservative appraisers that tend to derive lower appraisal estimates. We therefore estimate our base model with fixed effects for the appraiser, the appraiser firm and the mortgage seller to the GSEs. Inclusion of these fixed effects does not materially impact the estimated coefficients or the fit of the model (see Appendix B for discussion and Appendix Table 1 for the results).

3.1 Features of Appraisal Reports

Appraisers are licensed, and most states require a combination of coursework and apprenticeships for licensing. Appraisers are required to follow the Universal Standards of Professional Appraisal Practice (USPAP) in reaching an estimated value. The Dodd-Frank Act also requires the appraiser to be independent from the lender to ensure a fair and unbiased house value.[8] In this section, we partially break down the difference in the appraisal values by examining the sections of the appraisal report that are relatively more subjective in the sense of requiring an evaluative judgment.

Appraisers are required to use comparable properties that have recently sold to estimate the value of the property. Appraisers are responsible for determining which comparable properties are the most suitable and appropriate.[9] After selecting comparable properties, appraisers adjust the value of these properties to account for differences with the assigned property. These adjustments potentially account for differences in house characteristics, location (e.g., corner lot), financing (e.g., presence of concessions) and market conditions, among others. The net adjustments made by the appraiser can be positive or negative, with a negative adjustment implying that appraisers reduce the value of the assigned property relative to the available comparable houses.

[8] This policy was in response to the widespread evidence that appraisals in the period leading up to the Great Recession were too high and that appraisers may have been influenced by lenders to match the appraisal value to the high contract prices in the housing market (see Eriksen et al. (2018)).
[9] Appraisals are required to select properties with similar characteristics and, if possible, in the same neighborhood and within the last 12 months. For further details see https://selling-guide.fanniemae.com/sel/b4-1.3-08/comparable-sales.

We examine if the net adjustments made to comparable properties to determine the appraised value of the assigned property for single females tend to be lower compared to those for single males. We scale the average net adjustment of comparable properties by the appraisal value of the assigned property.[10] As seen in Column 1 of Table 4, the coefficient estimate on *Single Female* is negative and significant, indicating that comparable properties are adjusted down for homes of single females relative to similar homes owned by single males in the same tract in the same year-quarter. In contrast, homes owned by couples are adjusted upwards compared to single males, as the coefficient on *Couple* is positive and significant. Choosing the appropriate comparable properties and net adjustments is the responsibility of the appraiser, and the results show that this judgment by the appraiser is less favorable for female owners on average.

The appraiser is also required to make a condition rating of the property. Condition ratings are standardized ratings that capture the overall state of the property and range from one to six with one being the best. We create the variable *Condition* which is seven minus the condition rating so that higher values of *Condition* imply better home ratings. In Column 2 of Table 4, we find that homes by single females are likely to receive a less favorable *Condition* rating than those of single males. Appraisers must also assign a quality of construction rating, which is also standardized and ranges from one to six. We create a *Quality* variable that is equal to seven minus the construction quality rating so that it is increasing in construction quality. Column 3 shows that homes of single females (couples) are likely to get less (more) favorable construction ratings than those of single males.

Lastly, appraisers must identify whether the house has any updates and the level of updating. Whereas the condition rating takes a holistic view of the property, updating can identify specific areas of the house. We create an *Update* variable that takes the value of one if the appraiser indicated that the house had a kitchen and bathroom update in the last five years. As seen in Column 4 of Table 4, homes of single females (couples) are less (more) likely to show an update relative to those of single males.

[10] We multiply this ratio by 100 for tractability and winsorize it at the 1% level.

Overall, the results show that, along dimensions of the appraisal report that require relatively subjective inputs, homes of single females receive less favorable assessments from appraisers, consistent with their overall lower appraisal values. On the one hand, these differences could reflect accurate judgments about the homes owned by single female homeowners. On the other hand, these relatively subjective fields could potentially be more susceptible to influence by the appraiser's beliefs about the borrower independently of the house itself. These could reflect preferences or taste of the appraiser or could arise from statistical discrimination where appraisers with less knowledge of female ownership hold stereotypical views of female home ownership. To help shed light on this, we next consider factors that result in cross sectional variation in appraisal values and the estimated female-male gap.

4. Mechanisms Underlying the Male and Female Appraisal Value Gap

In this section, we shed light on the mechanisms that influence the gap in appraisal values by considering its cross-sectional variation. We consider several sources of variation, including characteristics of the borrower, appraiser, appraisal procedure, and local housing markets.

4.1 Homeowner Name

If an appraiser is influenced by beliefs about women as homeowners, then this can only affect appraisal values to the extent that the appraiser can perceive which homeowners are single females. One way for the appraiser to identify the homeowner's sex is through any interactions that might take place during the house visit. Another way is to infer it based on the homeowner's name on the appraisal form, especially for names that can be easily associated with a sex (e.g., Jane or Mary).

To examine the latter channel, we consider appraisals that were excluded from our main sample due to the inability to determine the sex from the first name.[11] In this sample, it is likely to also be difficult for the appraiser to infer the sex of the homeowner just based on the name. We focus on the subset of these observations that can be merged to the MLIS data, which allows us

[11] This was either because the first name was not available, or not on the GenderChecker or Namsor list, or was classified as unisex, that is had a probability of less than 95% of being male or female.

to observe the sex of the homeowner directly. As seen in Column 2 of Table 5, the estimated coefficient on *Single Female* is -0.011 and notably smaller than the coefficient estimated in merged UAD-MLIS sample, where the sex is relatively easy to infer (see Column 1 of Table 5).

In a further exercise, we partition our original UAD sample based on how easy it is to determine the sex from the first name. The "unambiguous" sample consists of the first names with a 98% or greater probability of being female or male. The "ambiguous" sample consists of the remaining sample, that is, observations with first names having a probability of less than 98% but greater than 95% (our cutoff) of being male or female. As can be seen by comparing Column 3 and Column 4 of Table 5, the estimated coefficient on *Single Female* is more negative on the sample of unambiguous names. Overall, the results suggest that appraisal values are influenced by the ease of inferring the homeowner's sex. Even if the house visit does not involve an interaction between the female homeowner and the appraiser inference that the homeowner is female from the first name is associated with lower appraisal values.

4.2 Appraiser Characteristics

Prior studies have examined the role of female agents and intermediaries on male and female gaps in various contexts. Bose, Filomeni and Tabacco (2024) document that female loan officers use their soft information about within-group members to mitigate the sex-related gaps in credit access. Cornaggia and Xia (2023) document that females with student loans are more likely to switch to economically advantageous alternatives when their service representatives are females. Egan, Matvos and Seru (2022) document that female financial advisors receive stronger punishment for misconduct but that this gap is ameliorated when there are female managers. However, not all studies find evidence of preferences for within-group members, with Huang, Mayer and Miller (2024) documenting that the likelihood of promotion for women in financial institutions does not vary with the sex of the decision maker. If there is within-group affinity, or if there is better soft information within groups, then we expect that female appraisers would be less likely than male appraisers to assign lower values to homes of single female owners.

Aside from the sex of the appraiser, other characteristics of appraisers, such as prior experience with female homeowners and overall depth and breadth of experience, could increase

exposure of the appraiser. If the appraisal gap is partly due to lack of knowledge about how women maintain and improve their homes, then greater exposure to single female homeowners in particular or wider breadth of experience to diverse types of properties and homeowners in general could mitigate the gap. We therefore construct several variables to capture the appraiser's experience and exposure and examine their impact on the appraisal gap.

To examine the role of the appraiser's sex, we obtain the name of the appraiser and determine the sex from the first name using the same methodology that we followed for homeowners. About 20.9% of the appraisals were performed by female appraisers. We create a *Female Appraiser* dummy and include it and its interaction with *Single Female* and *Couple*. As seen in Column 1 of Table 7, we find that the coefficient on the interaction of *Single Female* and *Female Appraiser* is positive and significant though small in magnitude. In other words, female appraisers mitigate some of the gap in the appraised values of the homes of single females relative to those of single men. However, the coefficient on the interaction of *Female Appraisers* and *Couple* is also positive and significant, suggesting that female appraisers also appraise homes of *Couple* higher than similar homes of single men and amplify the positive gap for couples.

To measure the exposure of appraisers to single female homeowners, we construct two variables based on appraisals done by the appraiser over the past 16 quarters in our sample. The first variable, *Single Female Fraction*, is the fraction of all appraisals that were for single female homeowners, which has a mean of 0.2 in our sample (see Table 6). Note that we restrict the sample to appraiser-years where there were at least 20 appraisals in the past 16 quarters. The second variable, *Log (Num Female Appraisals)*, is the natural log of the number of appraisals done for single female homeowners. As a basis for comparison, Column 2 of Table 7 reports the baseline estimation on this sample. As seen in Column 3 of Table 7, the coefficient on the interaction of *Single Female* and *Single Female Fraction* is positive and significant, suggesting that the appraisal gap for single female homeowners is decreasing in the appraiser's exposure to single female homeowners. Additionally, the coefficient on *Single Female* in Column 3 is larger than in Column 2. The results with *Log (Num Female Appraisals)* are displayed in Column 4 and

are qualitatively similar. These results suggest that the estimated gap in appraisal value is lower for appraisers that have greater prior experience with female home owners.

We also construct three variables to capture the depth and the breadth of an appraiser's experience. The first variable is *Log (Number of Appraisals)*, which is the natural log of the number of appraisals done by the appraiser in the prior 16 quarters. The second variable is *Log (Number of Tracts)*, which is the natural log of the number of different census tracts, and the third variable is *Log(SD of Tract Median Value)*, which is the natural log of the standard deviation of the median appraisal value of all houses in the tracts that spanned the appraisals done in the past 16 quarters. The latter two variables capture the breadth of the neighborhoods and their income levels that the appraiser has worked with in the prior years. As seen in Columns 5-7, the coefficient on the interaction of *Single Female* and all the above three appraiser characteristics is positive and significant, showing that more experience and more breadth of experience mitigate the appraisal gap for single females. We also find that appraiser characteristics mitigate the positive gap for couples.

4.3 Appraisal Procedure

In a traditional appraisal, the appraiser sometimes interacts with the homeowner when visiting the property, which could increase the susceptibility of the appraisal value to being affected by opinions about the homeowner, including with respect to sex. If this partly accounts for the gap in appraisal values, then we expect this effect to be smaller for appraisal procedures that reduce the importance of face-to-face interactions and relatively subjective inputs of the appraiser. Existing studies suggest that demographic differences in financial outcomes can be mitigated by analogous procedures in other contexts (see D'Acunto, Ghosh and Rossi (2024) and Bartlett et al. (2022)). We focus on two aspects of the appraisal process that capture these differences.

The first is the use of hybrid appraisals. In a hybrid appraisal, a third party performs the property inspection and provides the information to the licensed appraiser, who then uses this

information along with other data to complete the appraisal. In other words, hybrid appraisals reduce the interaction between the appraiser and the homeowner.[12]

The UAD does not have data on hybrid appraisals, which is only available in the MLIS data. Therefore, we implement this analysis using the MLIS data. However, the MLIS data does not have any details on property characteristics, preventing us from including house controls. We create a *Hybrid Appraisal* dummy that takes the value of one for hybrid appraisals and include it and its interaction with *Single Female* and *Couple*. As can be seen in Column 1 of Table 8, hybrid appraisals are associated with higher appraisal values for single females and lower values for couples. These results suggest that limiting interaction between the appraiser and the homeowner reduces the observed gap in appraisal values not only for single females but also for couples. However, it should be noted that this estimation only has year-quarter-tract fixed effects and no controls for property characteristics.

The second factor potentially affecting the appraisal procedure is the presence of FinTech lenders. FinTech mortgage lenders use a mostly online application process and are known for their rapid application processing speeds and agile adjustment to changing mortgage demand volumes (Fuster et al. (2019)). As mortgage lenders are independent from appraisal firms, the practices of FinTech lenders need not impact appraisal practices. However, the lender can influence the appraisal indirectly since it usually selects the appraiser. In particular, we hypothesize that appraisals associated with mortgages originated by FinTech lenders could rely more on standardized inputs to better align with their advantages in speed and scalability

We construct the *FinTech Share* as the fraction of FinTech-originated mortgages over total mortgages originated in a given tract in the previous year.[13] The FinTech share could be either the fraction of the number of loans (indexed as EW for "equal-weighted") or the fraction

[12] Hybrid appraisals have been available via pilot programs, with the earliest recorded instance in our sample occurring in 2017. They have more recently been added to the GSEs' selling guide for a limited set of eligible cases. For example, the Fannie Mae selling guide (see https://selling-guide.fanniemae.com/sel/b4-1.2-03/hybrid-appraisals) states that hybrid appraisals are eligible for cases in which a property is originally eligible for value acceptance and property data (which refers to an appraisal waiver) but then loses eligibility for value acceptance due to a change in qualifying loan characteristics. In these cases, the lender provides the property data collection to an appraiser to perform a hybrid appraisal assignment.

[13] The share of FinTech lenders and the calculation of *Female Share* and *Applications*, discussed in the next section, are based on data from the Home Mortgage Disclosure Act (HMDA).

of dollar volume (indexed as VW for "value-weighted"). The classification of lenders as FinTech is based on either Fuster et al. (2019) or Buchak et al. (2018). This results in four different measures of the *FinTech Share*. As can be seen from Columns 2 to 5 of Table 8, we find that a higher *FinTech Share* is associated with a smaller gap. The coefficient on the interaction of *FinTech Share* with *Single Female* is positive and significant across all four specifications, and the coefficient on the interaction of *FinTech Share* with *Couple* is negative and significant in all four specifications. These results are consistent with prior literature showing that varying procedures can affect financial outcomes across different borrower groups.

4.4 Local Housing Characteristics

In this section, we examine how the gap in appraisal values varies with different characteristics of local housing markets.

4.4.1 Share of Female Homeowners

Similar to section 4.2, which considers exposure to single female homeowners based on the appraiser's recent experience, Columns 1 and 2 of Table 9 consider exposure based on the share of female mortgage applicants in the census tract. In particular, we construct the share of female applicants in a census tract in the previous year-quarter based on the number of mortgage applications, which we refer to as *Female Share* and index by "EW".[14] We also construct the female share based on loan volume, which is indexed with "VW". Note that the *Female Share* itself is absorbed by the fixed effects. As seen in Table 9, high *Female Share*, both by number of applicants and volume, mitigates the gap in appraisals. A high *Female Share* also mitigates the positive appraisals obtained by couples; however, it is significant in only one specification.

4.4.2 Busy Periods

"Hot" housing markets, characterized by a large number of sales and refinances, produce a larger set of recently sold comparable properties that appraisers can use to determine appraisal values. This could make it easier for appraisers to find very similar comparable properties and

[14] This was constructed using data from the HMDA. The measure captures the share of females in both the refinancing and purchase of properties.

reduce the reliance on relatively subjective adjustments. Busy periods could also increase the reliance on objective and scalable procedures result in a narrower gap. Goldsmith-Pinkham and Shue (2023) also note that hotter housing markets are associated with a lower male and female gap in house transactions. We use the log of mortgage application numbers (EW) and volumes (VW) in a census tract-year-quarter as a proxy for how busy the local housing market is. As seen in Columns 3 and 4 of Table 9, busier periods are associated with a narrower male and female gap.

4.4.3 Wealth Level

In this subsection, we examine if the gap in home appraisal values varies across household wealth levels. More specifically, we examine if the appraisal gap is larger for women in economically disadvantaged areas. We calculate the median appraisal value for houses in the tract and include the interaction of its natural log, referred to as *Tract Median*, with *Single Female* and *Couple*. Note the median tract value is absorbed by the fixed effects. As seen in Column 5 of Table 9, the coefficient on interaction of *Single Female* and *Tract Median* is positive and significant, indicating that the gap in the appraisals of *Single Females* is lower in wealthier neighborhood. The positive gap for *Couples* is also lower in wealthier neighborhoods.

5. Impact on Refinancing Terms

As the appraisal value is important in determining the terms of the loan, a lower appraisal value could result in less favorable refinancing opportunities for female homeowners. In this section, we examine the effect of the lower appraisal value on the terms of the refinancing obtained.

5.1 Interest Rate

Lower appraisal values directly impact loan outcomes. When the appraisal for a property is low, the LTV ratio for the refinancing mortgage is higher, signaling higher risk and very likely

resulting in a higher interest rate. Prior literature has documented that mortgages with higher LTV ratios have higher interest rates (see Agarwal et al. 2017, Tzur-Ilan 2023).[15]

In Table 10, we estimate the effect of low appraisal values on interest rates while controlling for property characteristics and year-quarter-tract fixed effects. As the UAD data does not have loan-level details, we merge the UAD data with the MLIS data. From the MLIS data we are able to obtain loan details and control for those as well. Specifically, we include the interaction of 20-point credit score bins, five-point LTV bins, and DTI deciles along with indicators for loan term. We also include year-quarter-seller fixed effects.

The coefficient on *Log (Appraisal Value)* is negative and highly significant, as expected. Combined with the observation that appraisals for *Single Female* are on average lower by 2.4% (the estimated coefficient from Table 3, Column 5), the economic impact in Column 1 of Table 10 implies a 0.38% higher interest rates on account of the lower appraisal value.[16] As the average loan is $247,000 and the average interest rate is 3.76% in our sample, this implies paying about $647 more in annual interest costs.[17] Figure 3 illustrates the relationship between appraisal values and the mortgage interest rate, which is consistent with our results.

5.2 Loan Amount

Lower appraisal values reduce the value of the homeowner's equity and can reduce the loan amounts they receive for refinance mortgages. If a borrower is constrained by a maximum LTV limit, a lower appraised value translates directly into a lower loan amount. We estimate the impact of the appraisal value on the loan amount in Column 2 of Table 10. Note that we exclude LTV from the controls since it mechanically depends on the loan amount. The coefficient on *Log*

[15] As prior literature shows (see Fuster et al. (2013) and Bartlett et al. (2022)), among mortgages sponsored by the government-sponsored enterprises (GSEs), the guarantee fee (or g-fee) paid by lenders to the GSEs to cover projected borrower default and operational costs depends on LTVs and credit scores only through a course matrix. This grid regime started in March 2008 and has been adjusted several times since then.
[16] The estimated coefficient on *Log (Appraisal Value)* is -0.159. For single female owner this is then 0.024 x .159 = 0.0038 or 0.38%.
[17] Note that the monthly payment for a $247,000 30-year loan with an interest rate of 3.76% is $1,145.30, and the monthly payment for a similar loan but with 0.38% higher interest rate is $1,199.24. This determines a monthly difference of $53.94, or an annual difference of $647.28.

(Appraisal Value) is positive and significant. The estimated coefficient suggests that single female homeowners receive loans that are 1.89% smaller than those obtained by men.[18]

5.3 Cash-out Refinance

As a lower appraisal value reduces the value of homeowner's equity, it also reduces the cash-out amount available in the refinancing.[19] As seen in Column 3 of Table 10, a decrease in appraisal value is associated with a decrease in the cash-out amount. The estimated coefficient implies that single female homeowners' cash-out amount is 1.85% lower than that of single male homeowners.[20]

Combining our baseline results of the male and female gap in home appraisals, our results here imply that if single female owners receive a lower appraisal value, it could potentially lead to a lower cash-out amount for them, limiting their ability to leverage their home equity for consumption, investment or other financial needs. Chetty et al. (2014) document that homeowners who can access more equity in their homes are better positioned to make long-term investments, improve their property's value, or weather financial shocks, suggesting large long-term consequences for single female homeowners.

6. Robustness checks

In this section, we discuss some alternative explanations and robustness tests to address concerns with the data and analysis.

6.1 Home Improvements and Updates

One alternative explanation for our findings is that single females are less likely to update the house and engage in the upkeep of the premises as male homeowners. That is, the lower appraisal value could reflect this lack of regular updates and improvements. To examine this, we

[18] A 1% increase in appraisal is associated with a 0.788 increase in the loan amount. For single females the loan amount will be lower by 2.4 x 0.788 = 1.89%.
[19] Note that we infer the cash-out amount as the loan amount on a cash-out refinance minus the balance right before the closing date of the previous loan on the same property.
[20] The estimated elasticity is 0.771. As single women get a 2.4% lower appraisal value this implies a 1.85% lower cash-out amount.

look at appraisals of new homes that are less than five years old, in which case the need for an update or home improvement is likely to be low. If the lower appraisal value for single females is on account of a lower likelihood of home improvement projects, there should be no appraisal gap for them in this subsample of new homes. As seen in Panel A of Table 11, the estimated coefficient on *Single Female* has the same sign and a similar, albeit slightly smaller, magnitude as our baseline results. Additionally, similar to Table 4, single female owners are associated with lower net adjustments to comparable properties and lower ratings on quality of construction, although differences in house condition ratings and recorded updates are smaller in this sample.

In Panel B of Table 11, we also control for updates to the property within the last 15 years (Column 1) and within the last five years (Column 2). As expected, the coefficients of the *Update* indicators are positive and significant, indicating that properties with updates receive higher appraisal values. Controlling for property upgrades does not materially impact the negative significant coefficient for *Single Female*.

6.2 Omitted Property Characteristics

As discussed, we have included detailed house characteristics and year-quarter-tract fixed effects in our estimation. These control for houses with similar characteristics (such as the number of bedrooms, an indicator for a fireplace or garage, etc.) in the same tract and in the same year-quarter. However, despite these granular controls and fixed effects, there remain concerns that additional property characteristics could account for the difference in appraisals. For example, the house could be a corner lot or near train tracks, and single females could be more likely to occupy such disadvantaged properties.

To address this, we add property fixed effects. Note that our sample spans 11 years and inclusion of property fixed effects implies examining properties that are associated with multiple refinancing appraisals in this relatively short period. As some of them could be from the same (female) owner, we further require that the property be associated with a refinancing appraisal by at least one single male and at least one single female owner over the sample period. These restrictions substantially shrink the sample. It also results in a sample that differs in some characteristics from the full sample. Specifically, relative to the full sample this sample has

properties with higher mean appraisal values, more likely to be updated in the last five years, a higher fraction of single female households and are in tracts that have "hotter" real estate markets all characteristics that are associated with a lower male and female gap.[21]

However, even with these restrictive fixed effects the coefficient on *Single Female* is still negative and significant. The results in Column 1 of Table 12 show that within a decade the same property receives lower appraisal values when owned by a single female relative to a single male. The estimated gap is 0.7% and smaller than that estimated for the full sample. However, this is not surprising given the characteristics of this sample relative to the full sample. To increase the sample size, in Column 2 we relax the criteria to include properties that were owned by at least one single female homeowner and one instance of any other category, whether it be a single male or a couple. With this enlarged sample, we obtain qualitatively similar results.

We then examine the cross-sectional variation of the gap: specifically, we include the interaction of homeowner classification with *High Value*, a dummy that takes the value of one if the property is in a tract with an average appraisal value that is greater than the sample median. In Columns 3 and 4 of Table 12, we find that the single female appraisal gap estimated in lower value or relatively poorer neighborhoods is about the same as estimated in the full sample. The more prosperous neighborhoods are associated with little or no single female appraisal gap with the inclusion of property fixed effects. The results suggest that the male and female gap in appraisals is concentrated in relatively poorer neighborhoods.

6.3 Misclassification of Homeowners

The classification of homeowners as single female, single male or couple is based on the first names of borrowers as reported in the UAD data. However, errors in the classification could arise if the UAD does not list all the borrowers. Errors could also arise from our method of determining sex from names.

[21] The average appraisal value is $507 thousand relative to $466 thousand for the full sample. Single female householders account for 45% of the sample relative to 20% in the full sample. The sample has 41% of houses with updates in the last five years relative to 36% in the full sample. Average number and value of mortgage applications in quarter-tracts spanned by the sample are 419 and $131 million relative to 405 and $120 million in the full sample.

We examine the potential impact of this on our estimates using the merged UAD and MLIS data. In particular, we compare the results using the UAD classification of homeowners that has been used so far in the paper with the results when we use MLIS to classify a homeowner into single female, single male or couple. Note that the MLIS data sources its sex and borrower information from the Home Mortgage Disclosure Act (HMDA) data, which is a widely used source of demographic information about mortgages. Note that about 14% of the homeowners in the merged data of about 11 million observations have a different classification in MLIS. Of the homeowners that have different classification, the largest group (80%) is homeowners that we have classified as single while the MLIS classifies as couple. Among this group, 75% are couples that are classified as single males as UAD data reports only one name as the borrower. Despite these differences, as seen in Table 13, the estimated coefficient on *Single Female* with the UAD classification is -0.021 (Column 1) and with the MLIS classification is -0.020 (Column 2) in the merged UAD-MLIS data. The estimated coefficient on *Couple* is also qualitatively similar, as is the fit of the model. The results suggest that these sources of potential misclassification of homeowners in the UAD data does not materially impact our results.

7. Conclusion

We use a proprietary version of the UAD to examine the male and female gap in home appraisals. The UAD is unique in the detail of property characteristics and other information from the appraisal report that it provides. Controlling for detailed property characteristics along with granular fixed effects that allow us to compare similar homes in the same census tract and year-quarter, we document a significant and robust lower appraisal value for homes of single females relative to those of single males.

We find that homes of single females fare worse with respect to evaluative criteria that could be more subjective, such as adjustments relative to comparable properties, the condition rating of the house, the quality of the construction and whether any updates were visible. We find evidence that a lower ability to infer sex from the borrower's name, greater experience of the appraiser with single female homeowners, reduced direct interaction, and a greater availability of

recently sold comparable properties that can be used to reduce reliance on relatively subjective judgments, among other factors, can reduce some of the estimated gap in appraisal values.

The lower appraisal values have significant consequences for the refinancing terms obtained by the homeowner. Our results show that the lower appraisal values of single female homeowners are associated with higher interest rates, lower loan amounts, and lower cash-out amounts. The less attractive refinancing opportunities associated with the lower appraisal values are likely to account for some of the lower uptake of refinancing in low interest environments and also help explain why female homeowners exploit fewer of these apparently profitable opportunities. Our results also point to supply-side factors that inhibit profitable refinancing opportunities and may reduce the pass-through of monetary policy to some segments of the population.

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Appendix A – Variable Definitions

Variable name	Definition
Panel A. UAD sample variables	
Log(Appraisal Value)	The natural log of the appraisal value (reported by the appraiser) of the property associated with the refinancing mortgage application.
Net Adjustments	The average net adjustment of comparable properties scaled by the appraisal value of the assigned property. This variable is multiplied by 100 and winsorized at 1% and 99%.
Condition	The condition rating with values from 1 to 6 with 6 being the best condition.
Quality	the quality rating with values from 1 to 6 with 6 being the best quality.
Update	An indicator that equals one if there was an upgrade of kitchen or bathroom within the last five years.
Single Female	An indicator that equals one if the homeowner is classified as single female.
Couple	An indicator that equals one if the homeowner is classified as couples.
Single Male	An indicator that equals one if the homeowner is classified as single male.
Female Appraiser	An indicator that equals one if the appraiser is classified as female.
Hybrid	An indicator that equals one if the appraisal is classified as "hybrid" in the Mortgage Loan Information System (MLIS) data.
Fintech share	The fraction of FinTech-originated mortgages over total origination in a census tract in a given year.
Female share	The fraction of female mortgage applicants over the total number (volume) of applicants in a census tract in a given year if indexed by EW (VW).
Applications	The natural log of application number (volume) in a census tract in a given year if indexed by EW (VW).
Tract Median	The natural log of the median appraisal value in the tract in a given year.
Fireplace	An indicator that equals one if the property has a fireplace.
Pool	An indicator that equals one if the property has a pool.
Garage	An indicator that equals one if the property has a garage.
A/C	An indicator that equals one if the property has air conditioning.
Log(GLA)	The natural log of gross living area (in squared feet).
Num. Bedrooms	The number of bedrooms that the property in question has.
Num. Baths	The number of bathrooms that the property in question has.
Num. Stories	The number of stories that the property in question has.
Year Built	The year the property in question was built.
Update within 15 years	An indicator that equals one if there was an upgrade of kitchen or bathroom within the last 15 years.
Update within 5 years	An indicator that equals one if there was an upgrade of kitchen or bathroom within the last five years.
Panel B. UAD-MLIS merged sample variables	
Interest rate	The mortgage contractual interest rate.
Log(Loan Amount)	The natural log of the loan amount.
Log(Cash-out Amount)	The natural log of the cash-out amount.

Appendix B: Robustness Tests with Appraiser, Appraiser Firm and Lender Fixed Effects

To examine if appraiser characteristics account for some of the observed gap, we add appraiser fixed effects to the base specifications.[22] As seen in Column 1 of Appendix Table 1, inclusion of appraiser fixed effects does not substantially impact the fit of the model or the estimated coefficients of *Single Female* or *Couple*. We also include fixed effects for appraiser firm to examine if practices at the firm level rather than the individual level account for the estimated gap. As seen in Column 2, inclusion of appraiser firm fixed effects also does not materially impact the coefficients of interest.

The Dodd-Frank Act aims to make appraisers and appraiser firms independent from mortgage originators. However, the lender can influence the appraisal indirectly since it usually selects the appraiser. We therefore also estimate the base model with approximate originator fixed effects. Since the lender field in the UAD is non-standardized, we use the merged UAD-MLIS data to obtain the mortgage seller to the GSEs, which we use to approximate the originator,[23] and estimate the base model with seller fixed effects in the merged dataset. The results, displayed in Column 3, show that inclusion of seller fixed effects does not have a material impact on the estimated coefficient for *Single Female,* which continues to be negative and significant.[24]

[22] The appraiser fixed effects are determined by assigning identifiers based on the recorded appraiser name, and similarly for appraiser firm. Note that these fixed effects are approximate since a given appraiser or appraiser firm could be recorded differently across appraisal reports, which could make our indicators more granular than the true fixed effects.

[23] The originator coincides with the mortgage seller for about 72% of loans during our sample period. The remaining cases are "correspondent loans" in which the originator sells the loan to an aggregator which then sells it to the GSEs. The aggregator could still influence the practices of the correspondent lender and in turn the appraiser, albeit less directly.

[24] In un-tabulated results we estimated the base model with granular control variables and tract-year-quarter fixed effects in the UAD-MLIS merged dataset but without seller fixed effects. The coefficient on *Single Female* is -0.021 and that of *Couple* is + 0.017, which are materially unchanged with the inclusion of seller fixed effects.

Figure 1. Fraction of female appraisals over time

This figure presents the share of borrowers that are classified as single female over the years during 2013-2024. The data sample is all appraisal values associated with refinance mortgages in the Uniform Appraisal Dataset (UAD) sample, and the sample period is from 2013 through March 2024.

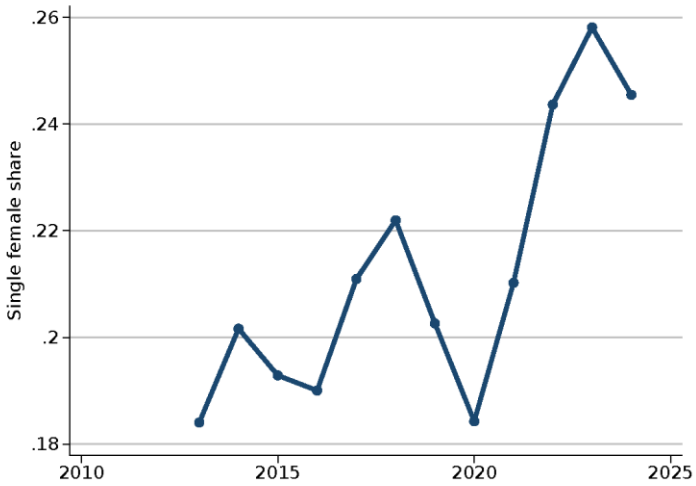

Figure 2. The Male and Female Appraisal Value Gap over Time

The figure presents the estimate on the Single Female indicator with a 95% confidence interval when estimating the baseline specification (with tract-by-year-quarter fixed effects) for each year separately. The data sample is all appraisal values associated with refinance mortgages in the Uniform Appraisal Dataset (UAD) sample, and the sample period is from 2013 through March 2024.

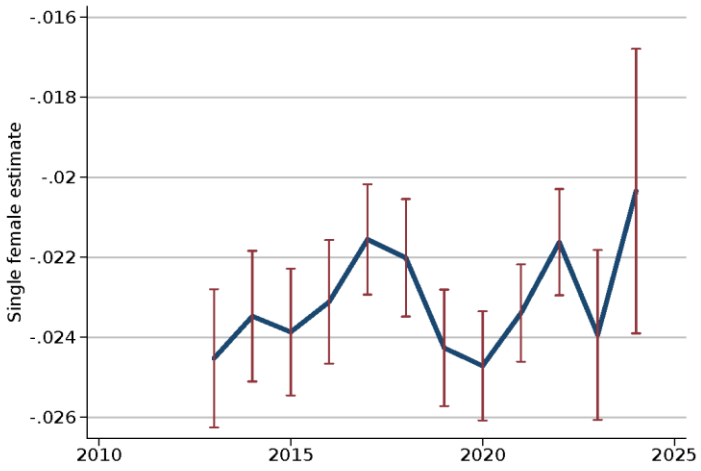

Figure 3. Appraisal values and mortgage interest rates

This binscatter figure plots the relationship between the natural log of appraisal values and the mortgage interest rate, after absorbing year-quarter fixed effects. Vertical lines of given color indicate respective mean of the group (i.e., single female, couple, and single male). The data sample contains all refinance mortgages in the MLIS-UAD merged data. The sample period is from 2013 through March 2024.

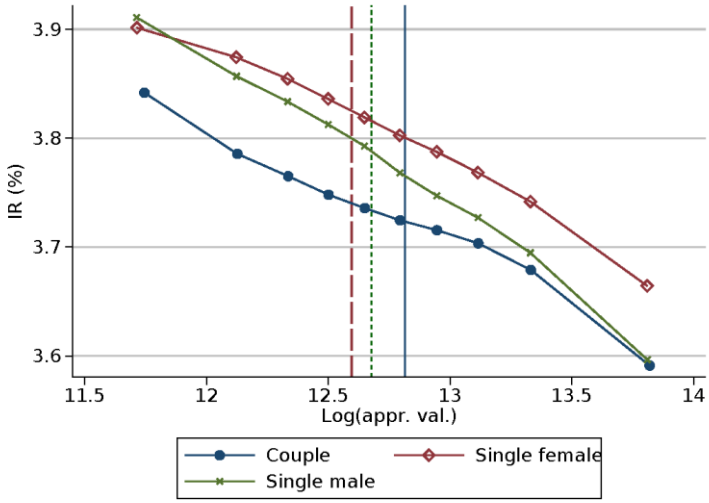

Table 1. Summary statistics for the UAD Sample

This table presents the summary statistics for the data variables from the Uniform Appraisal Dataset (UAD). The sample contains refinance mortgage applications only. The sample period is from 2013, the start of the UAD data, through March 2024. The unit of observation is an appraisal for a property. Statistics include the number of observations (N), mean (Mean), standard deviation (SD), the 25th percentile (P25), median (P50), and the 75th percentile (P75). The description of the variables is in Appendix A.

	N	Mean	SD	P25	P50	P75
Appraisal Value ($1000s)	21,966,371	465.76	481.33	221.00	340.00	530.00
Log (Appraisal Value)	21,966,371	12.77	0.71	12.31	12.74	13.18
Single Female	21,966,371	0.20	0.40	0.00	0.00	0.00
Single Male	21,966,371	0.37	0.48	0.00	0.00	1.00
Couple	21,966,371	0.43	0.50	0.00	0.00	1.00
Log (GLA)	21,966,122	7.55	0.41	7.26	7.53	7.83
Num. Bedrooms	21,966,323	3.35	0.86	3.00	3.00	4.00
Num. Bathrooms	21,965,535	2.47	1.00	2.00	2.00	3.00
Num. Stories	21,965,005	1.53	0.56	1.00	1.00	2.00
Year Built	21,962,357	1978.66	30.01	1960.00	1985.00	2002.00
Fireplace	21,966,371	0.63	0.48	0.00	1.00	1.00
Pool	21,966,371	0.13	0.34	0.00	0.00	0.00
Garage	21,966,371	0.83	0.37	1.00	1.00	1.00
A/C	21,966,371	0.82	0.38	1.00	1.00	1.00
House Age	21,962,357	39.31	30.07	16.00	33.00	58.00
Update within 15 Years	21,958,755	0.58	0.49	0.00	1.00	1.00
Update within 5 Years	21,966,371	0.36	0.48	0.00	0.00	1.00
Fintech Share (Buchak,EW)	21,462,283	0.11	0.07	0.05	0.09	0.17
Fintech Share (Buchak,VW)	21,462,283	0.11	0.07	0.05	0.09	0.16
Fintech Share (Fuster,EW)	21,462,283	0.10	0.05	0.06	0.09	0.13
Fintech Share (Fuster,VW)	21,462,283	0.10	0.05	0.06	0.09	0.13
Female Share (EW)	21,462,214	0.30	0.08	0.25	0.30	0.35
Female Share (VW)	21,462,214	0.28	0.08	0.22	0.27	0.33
Applications (number)	21,462,283	405.38	457.04	175.00	285.00	469.00
Applications ($ millions)	21,462,283	119.97	1344.87	35.59	71.31	136.60

Table 2. Summary Statistics for the MLIS and Merged UAD-MLIS Sample

This table presents the summary statistics of the regression analysis variables involving the Mortgage Loan Information System (MLIS) data. The variables *Appraisal Value ($1000s)* through *Hybrid Appraisal* are from a sample of refinances in MLIS associated with either a full/traditional or hybrid appraisal. The variables *Cash-out amount ($1000s)* through *Log (Loan amount)* are from a merger of MLIS with the Uniform Appraisal Dataset (UAD) sample. Both samples contain refinance mortgages that are backed by the GSEs. The sample period starts from 2013 and ends in March 2024. The unit of observation is an appraisal for a property. Statistics include the number of observations (N), mean (Mean), standard deviation (SD), the 25th percentile (P25), median (P50), and the 75th percentile (P75).

	N	Mean	SD	P25	P50	P75
Appraisal Value ($1000s)	17,217,985	410.69	321.26	224.00	335.00	500.00
Log (Appraisal Value)	17,217,985	12.73	0.62	12.32	12.72	13.12
Single Female	17,218,254	0.20	0.40	0.00	0.00	0.00
Single Male	17,218,254	0.29	0.45	0.00	0.00	1.00
Couple	17,218,254	0.52	0.50	0.00	1.00	1.00
Hybrid Appraisal	17,218,254	0.01	0.11	0.00	0.00	0.00
Cash-out Amount ($1000s)	3,852,633	71.85	60.48	33.15	54.41	90.38
Log (Cash-out Amount)	3,847,498	10.91	0.76	10.41	10.91	11.41
Interest Rate (%)	12,462,003	3.76	0.86	3.12	3.62	4.25
Loan Amount ($1000s)	12,462,003	247.47	134.87	145.00	220.00	325.00
Log (Loan amount)	12,462,003	12.27	0.57	11.88	12.30	12.69

Table 3. Male and Female Gap in Appraisal Values

This table displays results from an OLS estimation where the dependent variables is the natural log of Appraisal Value. The sample consists of all refinance appraisals from the UAD data over the period 2013 to March 2024. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (Couple). Log(GLA) is the natural log of the gross living area. Other control variables are described in Appendix A. Granular controls refers indicator variables for number of bedrooms, number of bathrooms, number of stories and year built. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	**Log (Appraisal Value)**				
Single Female	-0.144***	-0.051***	-0.048***	-0.040***	-0.024***
	(-25.21)	(-15.33)	(-15.42)	(-28.90)	(-40.64)
Couple	0.124***	0.062***	0.061***	0.031***	0.016***
	(16.74)	(11.08)	(11.66)	(19.33)	(22.90)
Fireplace		0.209***	0.201***	0.103***	0.060***
		(8.08)	(8.90)	(24.09)	(24.22)
Pool		0.153***	0.151***	0.096***	0.083***
		(7.56)	(8.12)	(14.77)	(24.13)
Garage		0.138***	0.143***	0.046***	0.059***
		(3.89)	(4.63)	(10.01)	(28.85)
A/C		0.042***	0.040***	-0.006***	-0.005***
		(8.83)	(8.88)	(-4.64)	(-10.60)
Log (GLA)		0.510***	0.565***	0.882***	0.766***
		(9.82)	(13.52)	(80.87)	(79.56)
Num. Bedrooms		-0.050***			
		(-4.07)			
Num. Baths		0.236***			
		(10.10)			
Num. Stories		-0.044			
		(-1.41)			
Year Built		-0.002**			
		(-2.33)			
Observations	21,796,426	21,790,522	21,790,517	21,783,921	21,388,347
Adj.R^2	0.065	0.428	0.459	0.822	0.921
Controls	No	Linear	Granular	Granular	Granular
Fixed Effects	Year-Qtr	Year-Qtr	Year-Qtr	Yr-Qtr-Cnty	Yr-Qtr-Tract

Table 4: Features of Appraisal Reports

This table displaces results from an OLS estimation where the dependent variable is an input in the appraisal report. The sample consist of all refinance appraisals from 2013 to March 2024. In Column 1 the dependent variable is the average net adjustment of comparable properties scaled by the appraisal value of the assigned property. This variable is multiplied by 100 and winsorized at 1% and 99%. In Column 2 (3), the dependent variable is the Condition (Quality) rating with values from 1 to 6 with 6 being the best condition. In Column 4, the dependent variable Update an indicator variable if there was an upgrade of kitchen or bathroom within the last five years. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Controls include Log (GLA), and indicators for fireplace, pool, garage, air conditioning (A/C), the number of bedrooms, bathrooms, stories, and the year built. Fixed effects included are listed below. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Dep. Var.	(1) **Net Adjustments**	(2) **Condition**	(3) **Quality**	(4) **Update**
Single Female	-0.090***	-0.016***	-0.013***	-0.016***
	(-15.74)	(-14.10)	(-27.47)	(-16.79)
Couple	0.117***	0.027***	0.012***	0.011***
	(22.46)	(21.20)	(14.67)	(11.10)
Observations	21,388,053	21,387,196	21,387,786	21,388,347
Adj.R^2	0.143	0.408	0.327	0.089
Controls	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract

Table 5: Impact of Names with Easily Determined Sex

This table displays results from an OLS estimation where the dependent variables is the natural log of Appraisal Value. The sample differs across the models and is specified in the last row. The Merged UAD-MLIS sample consists of appraisals that are in both datasets and we have used MLIS to classify the homeowner as single female, single male or couple. Excluded UAD-MLIS consist of appraisals that are in the MLIS dataset but are excluded from our baseline analysis due to not meeting our criteria for determining the sex from the first name of the homeowner. The UAD unambiguous (ambiguous) consists of all appraisals where the first name can be associated with a sex with a greater (less) than 98% probability. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (Couple). Granular controls refer to indicator variables for number of bedrooms, number of bathrooms, number of stories and year built. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.	**Log (Appraisal Value)**			
Single Female	-0.020***	-0.011***	-0.024***	-0.017***
	(-32.05)	(-13.76)	(-39.89)	(-11.59)
Couple	0.019***	0.013***	0.015***	0.019***
	(25.82)	(12.13)	(22.83)	(10.85)
Observations	11,283,432	689,344	20,931,816	9,132,311
Adj. R^2	0.907	0.934	0.921	0.918
Controls	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract
Classification of Homeowners	MLIS	MLIS	UAD	UAD
Sample	Merged UAD-MLIS	Excluded UAD-MLIS	UAD unambiguous	UAD ambiguous

Table 6: Summary Statistics for Appraiser Characteristics

This table displaces summary statistics for appraisal characteristics. All refinance appraisals conducted by an appraiser in the past four years, that is from quarter -16 to quarter -1, are used to construct appraiser characteristics. We drop appraiser-years where there are less than 20 observations in the past 16 quarters. Single Female Fraction is the fraction of all houses appraised by the appraiser that belongs to single females. Log (Female Appraisals) is the natural log of the number of appraisals done in the past 16 quarters that belongs to single females. Log (Number of Appraisals) if the natural log of the total number of appraisals in the past 16 quarters. Log (Num of Tracts) is the natural log of the number of different tracts that spanned the appraisals done in the past 16 quarters. Log (SD of Tract Median Value) is the natural log of the standard deviation of the median appraisal value in tracts that span the appraisals done in the prior 16 quarters.

	N	Mean	SD	P25	P50	P75
Single Female Fraction	14,742,350	0.20	0.06	0.16	0.20	0.24
Log (Female Appraisals)	14,725,880	3.54	1.05	2.83	3.61	4.29
Log (Num of Appraisals)	14,742,350	5.19	0.96	4.52	5.27	5.89
Log (Number of Tracts)	14,742,350	4.43	0.83	3.85	4.49	5.04
Log(SD of Tract Median Value)	14,738,891	11.85	0.66	11.38	11.74	12.26

Table 7. Appraiser Characteristics

This table displaces results from an OLS estimation where the dependent variable is the natural log of appraisal value. The sample for Column 1 consists of all refinance appraisals from 2013 to March 2024 and for the remaining columns excludes appraisals for which not enough data is available to calculate appraiser characteristic. Appraiser Characteristic included in the specification is listed at the top of the column. Female Appraiser takes the value of one if the appraiser is a female. Single Female Fraction is the fraction of all appraisals done in the prior 16 quarters that are for single female homeowners. Log (Num of Appraisals) [Log (Num of Female Appraisals)] is the natural log of the number of appraisals done in the prior 16 quarters [that are of single female homeowners]. Log (Num of Tracts) is the natural log of the number of tracts that spanned all appraisals done in the past 16 quarters. Log (SD of Tract Median Value) is the log of the standard deviation of median appraisal value for all tracts spanned by appraisals done in the prior 16 quarters. Fixed effects included are listed below. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Var.	**Log (Appraisal Value)**						
Appraiser Characteristics	**Female Appraiser**	**Base Model**	**Single Female Fraction**	**Log (Num of Female Appraisals)**	**Log (Num of Appraisals)**	**Log (Num of Tracts)**	**Log (SD of Tract Median Value)**
Single Female	-0.024***	-0.023***	-0.035***	-0.037***	-0.040***	-0.056***	-0.106***
	(-40.48)	(-41.32)	(-31.58)	(-41.34)	(-31.25)	(-30.76)	(-9.91)
Couple	0.015***	0.015***	0.023***	0.027***	0.032***	0.053***	0.225***
	(22.57)	(19.95)	(13.11)	(21.99)	(22.26)	(26.72)	(25.98)
Appraiser Characteristic	-0.000		-0.101***	-0.002***	0.000	0.002***	0.017***
	(-0.82)		(-23.41)	(-7.53)	(0.21)	(4.63)	(19.07)
Single Female x Appraiser Char	0.001**		0.055***	0.004***	0.003***	0.007***	0.007***
	(1.98)		(11.68)	(18.24)	(14.32)	(19.36)	(7.96)
Couple x Appraiser Char	0.002***		-0.047***	-0.004***	-0.003***	-0.009***	-0.018***
	(4.17)		(-6.49)	(-13.71)	(-13.57)	(-20.24)	(-24.75)
Observations	19,036,709	12,593,864	12,334,359	12,322,791	12,334,359	12,334,359	12,334,179
Adj. R^2	0.921	0.924	0.924	0.924	0.924	0.924	0.924
Controls	Granular	Granular	Granular	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract
Sample	Full	With Available Data on Appraiser Characteristics					

Table 8. Appraisal Procedure

This table displays results from an OLS estimation where the dependent variable is the natural log of the appraisal value. The data for Column 1 is from MLIS and for Columns 2 to 5 is from the UAD and spans 2013 through March 2024. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Hybrid is an indicator that equals one if the appraisal is classified as "hybrid" in the MLIS data. FinTech Share is the fraction of FinTech-originated mortgages over total origination in a census tract in a given year. The FinTech classification is based on Buchak et al. (2018) and Fuster et al. (2019). The share is calculated based on the loan count (EW) or the loan volume (VW) which is indicated at the column bottom. Controls include Log (GLA), and indicators for fireplace, pool, garage, air conditioning (A/C), the number of bedrooms, bathrooms, stories, and the year built. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.			**Log (Appraisal Value)**		
Single Female	-0.070***	-0.029***	-0.030***	-0.030***	-0.031***
	(-29.17)	(-30.06)	(-29.57)	(-28.74)	(-28.72)
Couple	0.087***	0.020***	0.019***	0.022***	0.020***
	(32.70)	(18.77)	(17.35)	(19.55)	(17.64)
Single Female × Hybrid	0.021***				
	(10.62)				
Couple × Hybrid	-0.043***				
	(-19.33)				
Hybrid	0.010***				
	(2.73)				
Single Female × Fintech Share		0.043***	0.052***	0.064***	0.075***
		(8.26)	(9.37)	(8.52)	(9.47)
Couple × Fintech Share		-0.042***	-0.036***	-0.066***	-0.050***
		(-8.33)	(-6.53)	(-9.71)	(-6.89)
Observations	16,211,393	21,157,995	21,157,995	21,157,995	21,157,995
Adj.R^2	0.708	0.922	0.922	0.922	0.922
Controls	No	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract
Measure		Buchak EW	Buchak VW	Fuster EW	Fuster EW

Table 9: Local Housing Markets

This table displays results from an OLS estimation where the dependent variable is the natural log of appraisal value. The data are from 2013 to March 2024. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Couple is an indicator that equals one if the homeowner is classified as couples. Female Share is the fraction of female mortgage applicants over the total number (volume) of applicants in a census tract in a given year and are index by EW (VW) at the bottom of the table. Applications is the natural log of mortgage application number (volume) in a census tract in a given year and indexed by EW (VW) at the bottom of the table. Tract Median is the natural log of the median appraisal value in the tract in the year. Controls include Log (GLA), and indicators for fireplace, pool, garage, air conditioning (A/C), the number of bedrooms, bathrooms, stories, and the year built. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	**Log (Appraisal Value)**				
Single female	-0.048***	-0.056***	-0.040***	-0.060***	-0.023***
	(-20.56)	(-27.16)	(-9.91)	(-11.73)	(-42.85)
Couple	0.015***	0.019***	0.061***	0.153***	0.017***
	(8.12)	(11.00)	(12.97)	(29.42)	(24.83)
Single female × Female share	0.076***	0.111***			
	(12.06)	(18.88)			
Couple × Female share	0.001	-0.014***			
	(0.18)	(-2.62)			
Single female × Applications			0.003***	0.003***	
			(4.20)	(7.16)	
Couple × Applications			-0.008***	-0.012***	
			(-10.78)	(-26.93)	
Single female × Tract Median					0.004**
					(2.37)
Couple × Tract Median					-0.023***
					(-22.50)
Observations	21,157,980	21,157,980	21,157,995	21,157,416	19,359,343
Adj.R^2	0.922	0.922	0.922	0.922	0.922
Controls	Granular	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract
Measure	EW	VW	EW	VW	

Table 10: Impact on Refinancing Terms

This table displays results from an OLS estimation where the dependent variable are features of the refinancing and specified at the top of the column. The sample is the UAD-MLIS merged data at the loan level and is from 2013 to March 2024. The dependent variable in Column 1 (2) [3] is the mortgage contractual interest rate (natural log of the Loan Amount) [natural log of the cash-out amount]. Log (Appraisal Value) is the natural log of the appraisal value. The estimation includes house controls like before that is Log (GLA), and indicators for fireplace, pool, garage, air conditioning (A/C), the number of bedrooms, bathrooms, stories, and the year built. Underwriting controls include the interaction of 20-point credit score bins, five-point LTV bins, and DTI deciles along with indicator for loan term when the dependent variable is Interest Rate, otherwise we exclude the interaction with the LTV bins for the other dependent variables since LTV mechanically depends on them. Fixed effects included are specified at the bottom of the table. Additionally, we include fixed effects for the loan seller (i.e., institution that sells to the GSEs, often the originator) by year-quarter fixed effects. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Dep. Var.	(1) **Interest Rate**	(2) **Log (Loan Amount)**	(3) **Log (Cash-out Amount)**
Log (Appraisal Value)	-0.159*** (-68.99)	0.788*** (387.63)	0.771*** (169.13)
Observations	12,075,583	12,075,583	3,240,124
Adj.R^2	0.833	0.779	0.298
House controls	Granular	Granular	Granular
Underwriter controls	Yes	Yes	Yes
Fixed Effects	Yr-Qtr-Tract Year-Qtr-Seller	Yr-Qtr-Tract Year-Qtr-Seller	Yr-Qtr-Tract Year-Qtr-Seller

Table 11. Robustness checks

This table displays the results of an OLS estimation. The dependent variable is displayed on the top row. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

Panel A: Subsample of New Homes

The sample is restricted to properties that are less than 5 years old. This is about 9% of the full sample.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	**Log Appraisals**	**Net Adjustments**	**Condition**	**Quality**	**Update**
Single Female	-0.020***	-0.051***	-0.003*	-0.010***	-0.000
	(-17.99)	(-3.93)	(-1.93)	(-5.61)	(0.28)
Couple	0.010***	0.067***	0.019***	0.010***	-0.003***
	(14.73)	(6.82)	(16.22)	(6.32)	(-2.72)
Observations	1,503,273	1,503,273	1,503,273	1,503,273	1,503,273
Adj.R^2	0.909	0.212	0.543	0.407	0.128
Controls	Granular	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract

Panel B: Controlling for Updates

Update within 15 yrs (Update within 5 yrs) is an indicator that equals one if the property had an upgrade within the last 15 (five) years.

	(1)	(2)
Dep. Var.	**Log (Appraisal Value)**	
Single Female	-0.023***	-0.023***
	(-40.24)	(-39.69)
Couple	0.015***	0.015***
	(23.12)	(23.46)
Update within 15 years	0.045***	
	(38.68)	
Update within 5 years		0.038***
		(45.26)
Observations	21,380,917	21,388,347
Adj.R^2	0.922	0.922
Controls	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract
Additional Fixed Effects	House age	House age

Table 12: Robustness with Property Fixed Effects

This table displays the results of an OLS estimation. The dependent variable is natural log of appraisal value and is displayed on the top row. The sample in Columns 1 and 3 consists of properties that had an appraisal for at least one single female and single male homeowner over the sample period from 2013 to March 2024. The sample in Columns 2 and 4 consists of properties that had at least one single female or single male/ couple homeowner over the sample period. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). High Value is an indicator variable that takes the value of one if the house is in tract with above median appraisal value. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.	**Log (Appraisal Value)**			
Single female	-0.007***	-0.006***	-0.017***	-0.023***
	(-10.67)	(-9.42)	(-9.83)	(-9.27)
Couple	0.005***	0.005***	-0.004	-0.013***
	(4.43)	(6.20)	(-1.57)	(-4.88)
Single Female x High Value			0.018***	0.031***
			(8.03)	(9.68)
Couple x High Value			0.014***	0.030***
			(4.36)	(8.79)
Observations	370,645	1,065,796	314,233	913,952
Adj. R^2	0.972	0.973	0.976	0.977
Controls	Granular	Granular	Granular	Granular
Fixed Effects	Yr-Qtr	Yr-Qtr	Yr-Qtr	Yr-Qtr
	Property	Property	Property	Property

Table 13: Potential Misclassification of Homeowners

This table displays the results of an OLS estimation. The dependent variable is natural log of appraisal value and is displayed on the top row. The sample consists of the merged UAD and MLIS sample over the 2013 to March 2024. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Column 1 uses UAD data on number of borrowers and GenderChecker/ Namsor to determine the sex from the names and classify homeowners. Column 2 uses MLIS classification of homeowners and this information is sourced from HMDA data. Fixed effects included are specified at the bottom of the table. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)
Dep. Var.	**Log (Appraisal Value)**	
Single Female	-0.021***	-0.020***
	(-32.51)	(-32.05)
Couple	0.017***	0.019***
	(27.51)	(25.82)
Observations	11,283,432	11,283,432
Adj. R^2	0.907	0.907
Controls	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract
Classification of Homeowners	UAD	MLIS

Appendix Table 1. Robustness with Appraiser, Appraiser Firms and Lenders Fixed Effects

This table displays results from an OLS estimation where the dependent variable is the natural log of appraisal value. The sample for Column 1, and 2 consists of all refinancing appraisals from the UAD and Column 3's sample is the merged UAD-MLIS data. The data are from 2013 to March 2024. Single Female (Couple) is an indicator that equals one if the homeowner is a single female (couple). Controls include Log (GLA), and indicators for fireplace, pool, garage, air conditioning (A/C), the number of bedrooms, bathrooms, stories, and the year built. Fixed effects included are listed below. Column 1 (2) includes additional fixed effects for the appraiser (appraiser firm). Column 3 includes additional fixed effects for the institution that sells the mortgage to the GSEs. T-statistics computed using county-clustered standards errors are in parentheses. *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
Dep. Var.	**Log (Appraisal Value)**		
Single Female	-0.023***	-0.023***	-0.020***
	(-40.04)	(-40.07)	(-31.69)
Couple	0.016***	0.016***	0.018***
	(23.74)	(23.79)	(28.12)
Observations	21,375,081	21,327,698	11,879,377
Adj.R^2	0.923	0.923	0.908
Controls	Granular	Granular	Granular
Fixed Effects	Yr-Qtr-Tract	Yr-Qtr-Tract	Yr-Qtr-Tract
	Appraiser	Appraiser Firm	Seller