8-2010

Is There a Link Between Money Illusion and Homeowners' Expectations of Housing Prices?

Lucy F. Ackert

Kennesaw State University and Federal Reserve Bank of Atlanta, lackert@kennesaw.edu

Brian K. Church

Georgia Institute of Technology - Main Campus

Narayanan Jayaraman

Georgia Institute of Technology - Main Campus

Follow this and additional works at: <https://digitalcommons.kennesaw.edu/facpubs>

Part of the [Real Estate Commons](#)

Recommended Citation

Ackert, Lucy F., Church, Bryan K. and Jayaraman, Narayanan, Is There a Link Between Money Illusion and Homeowners' Expectations of Housing Prices?, August 30, 2010.

This Article is brought to you for free and open access by DigitalCommons@Kennesaw State University. It has been accepted for inclusion in Faculty Publications by an authorized administrator of DigitalCommons@Kennesaw State University. For more information, please contact digitalcommons@kennesaw.edu.

Is There a Link Between Money Illusion and Homeowners' Expectations of Housing Prices?

Lucy F. Ackert,* Bryan K. Church** and Narayanan Jayaraman***

Money illusion is a behavioral bias in which a person thinks in terms of nominal rather than real values. This article reports homeowners' responses to a survey designed to measure the extent of money illusion as well as homeowners' expectations regarding home valuations. Our survey respondents suffer from money illusion, yet they have reasonable expectations of home prices. Our analysis did not identify any unique individual characteristic that correlates with homeowners' choices and suggests that the relationship between money illusion and mispricing is subtle and multifaceted.

For many Americans, their home is their largest and most important investment. A sense of security derives from home ownership and increasing housing prices. However, economists and the popular press question whether home prices in recent years reflected a price bubble in which case valuations were incorrect. A price bubble may be generated when people believe prices in the future will be even higher and, thus, are not concerned about paying a high price today. When homes are overvalued and prices are out of line with true economic valuations, a sharp downward adjustment at some point is to be expected. This article provides direct insight into a sample of homeowners' perceived valuations at the height of the housing price bubble and whether their expectations were reasonable.

Perceived home valuations have been linked to money illusion. Research suggests that people are subject to money illusion, a behavioral bias that results in decisions that are inconsistent with theory (Shafir, Diamond and Tversky 1997). A person who suffers from money illusion bases decisions on nominal

*Department of Economics and Finance, Coles College of Business, Kennesaw State University, Kennesaw, GA 30144 and Federal Reserve Bank of Atlanta, Atlanta, GA 30303-2713 or lackert@kennesaw.edu.

**College of Management, Georgia Institute of Technology, Atlanta, GA 30332-0520 or bryan.church@mgt.gatech.edu.

***College of Management, Georgia Institute of Technology, Atlanta, GA 30332-0520 or narayanan.jayaraman@mgt.gatech.edu.

rather than real values. When inflation is high, a person can suffer a real loss despite a nominal profit. A person with money illusion might actually prefer this outcome to one with a real gain. Recent research concludes that stock market participants suffer from money illusion (Cohen, Polk and Vuolteenaho 2005).

In the late 1990s and early 2000s low inflation was experienced in the United States. Brunnermeier and Julliard (2008) argue that low inflation in combination with money illusion fueled the housing price bubble. When people with money illusion compare the monthly rent on a home to the mortgage payment with a fixed-rate loan, they assume that real and nominal rates move together. When inflation is low, they believe that the real rate is low and, thus, undervalue the cost of future mortgage payments. If lower inflation leads people to expect low mortgage payments, money illusion may lead to upward price pressure on homes.¹

There are important, real effects of housing price changes. Large changes in home valuations can lead to considerable wealth transfers between buyers and sellers. In addition, an area perceived to be experiencing a housing price bubble will not be desirable for people considering relocation, which will lead to lower employment growth. Perhaps most importantly, a price bubble can have a significant impact on supply with overbuilding in areas of high price (Glaeser, Gyourko and Saiz 2008). Real resources are misallocated when prices are volatile and unconnected with fundamental valuations. When a bubble bursts, losses in productivity and regional recessions can result, as the price adjustment at the end of the 1980s shows (Case and Shiller 2003). The impact can be far-reaching, as we are all very well aware given the current world-wide financial crisis.

Real losses from a housing price bubble may be persistent because, even if many believe that home prices are disconnected from underlying fundamentals, adjustment toward reasonable valuations can take a great deal of time. It is difficult to take advantage of mispricing in the housing market because the

¹Upward pressure on home prices in periods of low inflation could also result from a "tilt effect." When inflation is high, lenders demand more in real terms in the early years of a mortgage in order to cover the lost value in later years. If inflation falls, buying becomes more attractive for liquidity-constrained borrowers as the payment required from current income falls. Though they recognize that the tilt effect is a possible explanation, Brunnermeier and Julliard (2008) conclude that money illusion drives recently observed mispricing in the housing market. Based on their conclusions, our goal is to further examine whether our sample of homeowners fall prey to money illusion and, in turn, whether this translates into unrealistic price expectations.

transactions costs are significant, carrying costs are large and there is no short-selling. Especially when compared to other asset markets, arbitrage in housing markets is extremely difficult, if at all possible.²

To provide insight into the conjecture that homeowners suffer from money illusion, which translates into unreasonable home valuations, we conduct a survey of local homeowners. Though surveys have numerous limitations, our research has the potential to provide important insight. Behavioral regularities are often first documented with survey methods (see, *e.g.*, Shafir, Diamond and Tversky 1997). Our results provide insight into how Americans view and respond to the level of housing prices and, further, offer direction for future empirical and theoretical research.

The remainder of this article is organized as follows. The first section describes the housing price experience in the United States from January 2000 through July 2008, and the following section describes the research method. Next we provide information on our sample of respondents and their attitudes toward mortgage financing and proffer evidence on whether the homeowners suffered from money illusion. In the subsequent section we report homeowners' expectations at the height of the housing bubble and consider whether the expectations are consistent with reasonable expectations about home values. We then examine whether homeowners' choices are related to individual characteristics. Finally, the article concludes with a discussion of the results and directions for future research.

Home Prices in the United States

Figure 1 shows a U.S. housing price index for January 2000–July 2008. This index is the S&P/Case-Shiller Home Price Index, published on the last Tuesday of each month.³ Twenty U.S. metropolitan areas are followed and indexes are designed to mirror prices for typical single-family homes in each area. The composite shown in the figure is a value-weighted measure of the 20 metropolitan areas followed. As the figure illustrates, overall U.S. home prices soared 106.52% from January 2000 to a peak in July 2006.

Although the overall market in the United States rose in the 2000s, the extent of price appreciation varied across the country. Figure 2 illustrates the price index for Atlanta, Boston, Los Angeles and Miami from January 2000 to July

²Case and Shiller (1989) argue that excess returns are forecastable based on their model, though they recognize that their evidence is not definitive because it is difficult to measure both tax effects and the implicit rent of a home.

³The price index data are available at www.homeprice.standardandpoors.com.

Figure 1 ■ Housing prices in the United States from January 2000 to July 2008.

Figure 2 ■ Housing prices in Atlanta, Boston, Los Angeles and Miami from January 2000 to July 2008.

2008.⁴ Across the 20 metropolitan areas followed by S&P/Case-Shiller, the largest price increase was experienced in Miami. At the peak in December 2006, home prices in Miami increased a whopping 181%. The experience in Los Angeles was similar: housing prices peaked in September 2006 with an increase of 174% since the inception of the index (in 2000). The home market in Boston peaked a year earlier in September 2005 with an increase of 82%. Other metropolitan areas experienced more moderate increases and peaked later, such as Atlanta with an increase of 36% as of July 2007.⁵

The price bubble in Atlanta, if one existed, was approximately one-third of the magnitude of the U.S. price index. Atlanta home prices peaked in July 2007, a year later than overall U.S. home prices, and the increase was comparatively small. In July 2008, the Atlanta home price index was not far from its value in October 2005, the time our survey was administered. The survey of homeowners, described in the following section, was administered in suburban Atlanta. We chose this location because, though there was price appreciation to some extent, the mispricing was relatively small, if there was mispricing at all. Our goal is to examine whether, in this environment of rising U.S. home prices, our sample of residents suffered from money illusion and, in turn, had unrealistic expectations about the future values of their homes.

Research Method

In October 2005, we surveyed residents of a community in a suburban area close to Atlanta, Georgia (*i.e.*, part of the greater metropolitan area). The “townpark” community includes 13 neighborhoods and various amenities such as pools, playgrounds, tennis courts and other shared recreational areas. In total, 1,961 homes were built between 1992 and 2005. We report on the responses of 141 adult residents who completed the survey at various community events, including children’s soccer games and a chili cook-off. Respondents were recruited using flyers and word-of-mouth and were paid for completing the survey, which typically required 20–30 minutes. Casual observation suggests that respondents took the task seriously and answered questions diligently.

The full survey is included in the appendix to this article. In addition to demographic questions, we asked respondents a number of questions regarding home valuations and types of loans (mortgages). We also included questions

⁴Case and Shiller (2003) considered Boston, Los Angeles, Milwaukee and San Francisco, while Case and Shiller (1989) included Atlanta, Chicago, Dallas and San Francisco. The four cities we highlight are chosen as representative of the U.S. experience.

⁵Of the cities included in the index, the smallest home price appreciation was observed in Cleveland with a peak increase of 23% in July 2006.

Table 1 ■ Sample characteristics.

	Tract	Georgia	United States
Housing characteristics			
<i>Number of homes</i>	4,930	1,596,408	115,904,641
<i>Home value (median)</i>	\$139,300	\$111,200	\$119,600
<i>Homeowners with mortgage</i>	92.3%	75.3%	70.0%
<i>Home built in 1990 or later</i>	68.7%	27.9%	17%
<i>Tenure in current home (median years)</i>	2–5	2–5	6–10
Demographic characteristics			
<i>Age (median years)</i>	31.0	33.4	35.3
<i>Gender (% male)</i>	48.6%	49.2%	49.1%
<i>Household income (median)</i>	\$63,229	\$42,433	\$41,994
<i>Race (% White)</i>	81.1%	65.1%	75.1%
<i>Family status (% married)</i>	64.4%	54.0%	54.4%
<i>High school degree or higher (%)</i>	92.3%	78.6%	80.4%
<i>Bachelor's degree or higher (%)</i>	38.5%	24.3%	24.4%

Note: The table reports demographic information for Census Tract 302.11, which includes the neighborhood surveyed, the state of Georgia and the United States. All data are from the Census 2000 Summary File, the most recent comprehensive demographic data available.

modeled after those reported in Shafir, Diamond and Tversky (1997) in order to measure whether the homeowners fell prey to money illusion.

To allow comparison between our sample of homeowners and the average for the state and nation, Table 1 reports demographic information for Census Tract 302.11, which includes the community surveyed, the state of Georgia and the United States. All data are from the Census 2000 Summary File, the most recent comprehensive demographic data available. The census track includes 4,930 homes of which 1,961 are in the surveyed area so that the community is a large component of the track.

Table 1 reports characteristics of the housing in the track, state and nation, including number of homes, median home value, percentage of homeowners holding a mortgage, percentage of homes built after 1990 and median years of tenure in current home. Median home value in the track is somewhat higher than in the state or nation, with a greater incidence of home mortgages and newer homes. While tenure in the home is lower than for the United States as a whole, it is comparable to the state of Georgia.

Table 1 also reports demographic characteristics, including median age, percentage of males, median household income, percentage of whites, percentage

of families with married partners and percentages with high school degree or bachelor's degree or higher. The census track includes a slightly younger population with higher household income, more whites, married families and higher educational attainment. Later in the article, we will consider whether demographic characteristics can explain differences in decisions across the sample of homeowners.

Respondents and Attitudes toward Mortgage Financing

Descriptive Information on Homeowners

Of the 141 homeowner respondents, 87 were female and 54 male. The average age was 37 years, with a range of 24 to 70. Nearly every respondent (91.5%) indicated that he or she was the primary decision maker in household financial decisions or that decision making was shared equally with another.

All respondents were homeowners, and most (69.5%) had owned more than one home. The vast majority purchased their current home in the \$100,001 to \$200,000 price range (60.3%) or \$200,001 to \$300,000 price range (29.1%). A small minority ($n = 6$ or 4.3%) were currently selling their home. The vast majority had household income in the \$0 to \$100,000 (49.6%) or \$101,000–\$200,000 (41.1%) range.

Financing Attitudes

Respondents were asked how the purchase of their home was financed. For a handful, their homes were fully paid for (4.3%). Others used fixed-rate, adjustable-rate or interest-only mortgages. They later were asked to identify the preferred mortgage type (fixed-rate, adjustable-rate or interest-only) under three conditions: assuming that prices in the community would rise, fall or remain constant. Responses (in percentages) follow.

Financing Method		Fixed-Rate	Adjustable-Rate	Interest-Only
Actual		69.5	19.9	6.4
Preferred	Increase	66.4	13.6	19.9
with price	Decrease	68.1	20.6	10.6
condition	Do not change	75.9	13.5	9.2

We observe a slight change in preference toward an interest-only mortgage when price increases and a slight change toward an adjustable-rate mortgage when price decreases.

Further inspection of the data indicates that nearly half of the respondents' mortgage preference did not vary by price condition. We found that 63 respondents (44.7%) chose a fixed-rate mortgage regardless of change in housing prices, three (2.1%) chose an adjustable-rate mortgage and four (2.8%) chose an interest-only mortgage.

We also asked respondents to rank the importance of five factors when financing the purchase of a new home, including mortgage interest rate, monthly payment, total loan amount, length of mortgage and expected increase in new home prices. Participants ranked mortgage interest rate and monthly payment as the most important factors. We performed Bonferroni comparisons and found that mortgage interest rate was ranked as more important than monthly payment at $p = 0.056$. Both factors were ranked as more important than each of the other three factors at $p < 0.001$.

Do Homeowners Suffer from Money Illusion?

Money Illusion and Income

We describe a series of scenarios and, for each one, elicit respondents' evaluations. In all scenarios, evaluations of the outcomes are made *ex post*, so that uncertainty has been resolved.⁶ Following Shafir, Diamond and Tversky (1997) we first presented respondents with a scenario involving two people, Ann and Barbara. The scenarios are identical except that we have increased the salary levels to more closely align with current market conditions.⁷ The scenario below is used to assess how respondents view changes in income level.

Scenario 1:

Consider two individuals, Ann and Barbara, who graduated from the same college a year apart. Upon graduation, both took similar jobs with publishing firms. Ann started with a yearly salary of \$50,000. During her first year on the job there was no inflation, and in her second year Ann received a 2% (\$1,000) raise in salary. Barbara also started with a yearly salary of \$50,000. During her first year on the job there was 4% inflation, and in her second year Barbara received a 5% (\$2,500) raise in salary.

- a. As they entered their second year on the job, who was doing better in economic terms?

⁶Future research might investigate how outcome uncertainty impacts the evaluation of a scenario.

⁷In addition to the salary adjustment, our survey design differs in that Shafir, Diamond and Tversky (1997) asked these questions across participants. In our survey we ask all respondents the same set of questions.

Ann 78.42% Barbara 21.55%

b. As they entered their second year on the job, who do you think was happier?

Ann 27.34% Barbara 76.66%

c. As they entered their second year on the job, each received a job offer from another firm. Who do you think was more likely to leave her present position for another job?

Ann 75.54% Barbara 24.46%

Below each question and to the right of the name of each individual in the scenario we report the percentage of respondents making that choice. Respondents recognized that Ann was doing better in economic terms due to differences in inflation. However, subsequent responses suggest that nominal salaries matter: Ann makes less in nominal terms and, as such, is perceived to be less happy and more likely to change jobs. Consistent with Shafir, Diamond and Tversky (1997), when economic factors are stressed, respondents recognize that Ann is doing better in economic terms. However, when the emphasis is not on the economic aspects, responses are driven by nominal factors. Happiness (question b) and actions (question c) are determined by nominal valuations. Shafir, Diamond and Tversky argue that people can discern the difference between real and nominal valuations (as in question a) but when they are not focusing strictly on economic terms, nominal valuations dominate.

Recent psychology research sheds further insight into this result. When people make decisions they use one of two processing systems (Evans 2008, Gino, Moore and Bazerman 2009). The first, System 1, is fast, unconscious and driven by affective reaction. Without a nudge, System 1 is the default. However, a contextual factor may affect the means of reasoning, promoting deliberation in some instances and leading a person to use the second processing system. System 2 is slower and more deliberate. This literature suggests that when we ask respondents to focus on “economic terms” they consider the situation on the conscious level, using rational and analytic thinking. However, when the choice is more instinctive, as when we ask who is “happier” or “likely to leave her present position,” emotion and gut-feelings provide the basis for decision.⁸

⁸Alternatively, the responses to questions a and b in Scenario 1 might be explained by the respondents' views on how others process information. The results are consistent with respondents who see others as less sophisticated and more likely to use affective processing. Future research could more directly delve into this issue by randomizing the order in which the questions are presented to participants and adding questions in which emotional cues are emphasized.

Money Illusion and Transactions in Housing

We include three scenarios to gain insight into how respondents perceive mortgages and housing prices. The first considers how people evaluate a transaction, again following Shafir, Diamond and Tversky (1997).⁹

Scenario 2:

Consider the following. Adam, Ben and Carl each received an inheritance of \$200,000, and each used it immediately to purchase a house. Suppose that each of them sold the house a year after buying it. Economic conditions, however, were different in each case.

- When Adam owned the house, there was 25% deflation—the prices of all goods and services decreased by approximately 25%. A year after Adam bought the house, he sold it for \$154,000 (23% less than he paid).
- When Ben owned the house, there was no inflation or deflation—the prices of all goods and services had not changed significantly during that year. He sold the house for \$198,000 (1% less than he paid for it).
- When Carl owned the house, there was 25% inflation—the prices of all goods and services increased by approximately 25%. A year after he bought the house, Carl sold it for \$246,000 (23% more than he paid). Please rank Adam, Ben and Carl in terms of the success of their house transactions. The person assigned a “1” made the best deal and a “3” the worst deal.

The following table summarizes nominal and real gains as well as the homeowners’ responses:

	Adam	Ben	Carl
Nominal value	–23%	–1%	+23%
Real value	+2%	–1%	–2%
Ranking			
1	21.28%	22.70%	57.45%
2	19.15%	70.21%	17.73%
3	59.57%	7.09%	24.82%

⁹As noted above, our survey design differs in that Shafir, Diamond and Tversky (1997) asked these questions across participants, whereas we ask all respondents the same set of questions. Shafir, Diamond, and Tversky reverse the order of presentation within the scenario (*i.e.*, Carl, Ben and Adam) for half of their participants and find that order does not matter.

As with Scenario 1, the evidence suggests that the homeowners are subject to money illusion. Our respondents seem to rank in terms of nominal values (Carl, Ben and Adam). When evaluating "who made the best deal" respondents base their decision on an affective reaction, using the default System 1.

Because our focus is on home prices, we add two questions specifically designed to elicit views on money, mortgages and the sale of a home. We next consider how mortgage payments impact the value of a transaction.

Scenario 3:

Donna and Jill each acquired similar new homes for \$175,000. Both obtained a mortgage for \$150,000 at the time of purchase.

- Donna obtained a fixed-rate mortgage. Over five years she made monthly payments totaling \$48,000 (\$800 per month $\times$ 60 months). The outstanding loan balance is \$138,000 at the end of five years.
- Jill obtained an interest-only mortgage. Over five years she made monthly payments totaling \$36,000 (\$600 per month $\times$ 60 months). The outstanding loan balance is \$150,000 at the end of five years.

Donna and Jill are now selling their homes. Assume that over the five years interest rates have not changed.

a. Donna and Jill each sell their home for \$215,000. As a result, Donna walks away with cash of \$77,000, whereas Jill walks away with cash of \$65,000. Who has done better on the sale of her home? *Check the one who has done better.*

Donna 30.00% Jill 22.86% Equally 47.14%

b. Who is happier as a result of the sale transaction described in (a)?

Donna 48.92% Jill 19.42% Equally 31.65%

c. Now assume that Donna and Jill each sell their home for \$140,000. As a result, Donna walks away with \$2,000 in cash, whereas Jill has to pay \$10,000 in cash. Who has done better on the sale of her home? *Check the one who has done better.*

Donna 60.71% Jill 12.14% Equally 27.14%

d. Who is happier as a result of the sale transaction described in (c)?

Donna 77.70% Jill 13.67% Equally 8.63%

Following each question, we report the percentage of respondents choosing Donna, Jill or equally between the two. When the homes were sold at a gain, the majority of respondents indicated that the Donna and Jill did equally well,

but that Donna was happier—presumably because Donna received more cash. In contrast, when the homes are sold at a loss, the majority indicate that Donna did better and was happier—presumably because Jill had to pay out of pocket at closing.

As in previous scenarios, when asked who “had done better” or was “happier” respondents evaluate the situation using an affective reaction. Narrow framing and loss aversion can explain respondents’ negative reaction to paying out of pocket (Thaler 1999). Depending on the context of a choice, people may jointly or separately evaluate outcomes. When the outcomes are evaluated by integrating the monthly payments with the gain or loss upon sale of the home, Donna and Jill seem to be in a similar situation. However, if the cash flows are segregated, the outcomes for Donna and Jill are quite different. People are loss averse so that a loss of \$10,000 is felt much more strongly than an equal monetary gain. When a loss of \$10,000 is evaluated compared to a gain of \$2,000, the loss is felt strongly even though the changes are nominal. Furthermore, the potential of a liquidity constraint will lead to an even stronger affective reaction to the potential of a loss of \$10,000.

In the final scenario presented to homeowners, we asked them to consider whether a couple should purchase a home that had a price that was higher than the maximum amount that they had determined they should spend. According to Case and Shiller (2003) in a bubble environment homebuyers will conclude that it is acceptable to buy a home that would usually be too expensive because prices will continue to rise.

Scenario 4:

Consider the following. Jane and John Doe currently rent an apartment, but have been saving in hopes of buying their first home. The couple determined, based on a personal assessment of their financial affairs, that they have the means to purchase a \$200,000 home. They determined that \$200,000 is the most that they should spend. After spending countless hours looking, the Doe's identified a new home that has everything that the couple wants and needs: the house is perfect. Unfortunately, the new home costs 25% more than the couple planned to spend: the price of the new home is \$250,000. The couple, however, has qualified for a mortgage to finance the new home—so there are no obstacles preventing the purchase.

a. Should the couple purchase the new home?

Definitely Do
Not Purchase

1—2—3—4—5—6—7—8—9—10—11

Don't Know

Definitely
Purchase

Figure 3 ■ Evaluations of a home purchase decision.

b. Assume that the Doe's qualified for a fixed-rate mortgage as well as an interest only mortgage. Which type of mortgage should the Doe's use to finance the purchase of the new home?

fixed-rate 65.00% interest-only 35.00%

For the first question of scenario 4 we find a mean response of 4.9, median response of 4.0 and modal response of 1.0 (16.4%), indicating that many respondents thought the purchase might not be such a good idea. Figure 3 reports the response frequencies. Though some respondents thought the Doe's should not buy the home (41% responded 1, 2 or 3), many were unsure or thought they should go ahead with the purchase (45% responded 6–11). These results provide some support for Case and Shiller's argument that some people will recommend buying a home that is really more than the family should spend when home prices are high.

The second question in Scenario 4 is included to shed light on the conjecture often made in the popular press that interest-only loans were being used to allow homeowners to purchase homes that were really more than they could afford. We observe that the percentage of respondents who recommended interest-only financing (35%) was fairly high in relation to figures presented earlier. Recall that less than 7% of our respondents had an interest-only mortgage, and under

Figure 4 ■ Thirty-year conventional mortgage rates in the United States from April 1971 to July 2008.

conditions that were most conducive to such loans (rising home prices), this type of financing was favored by only 20% of the respondents.

Were Homeowners Reasonable?

In the previous sections, we document money illusion among our sample of homeowners. Many of these homeowners also recommended buying a home with a price outside the family budget. Did money illusion translate into unreasonable expectations about the values of their homes in the future? Brunnermeier and Julliard (2008) argue that the bulk of the mispricing in the housing market in recent years can be explained by money illusion and changes in inflation. Recall that decreases in inflation potentially can lead to increases in home prices if people fall prey to money illusion. When inflation falls, people who are subject to money illusion believe that low inflation translates into low real interest rates so they underestimate the current value of future mortgage payments. This, in turn, leads to higher home prices.

The 2000s were characterized by relatively low inflation and low mortgage rates. Figure 4 illustrates inflation measured using the percentage change in the consumer price index and 30-year conventional mortgage rates in the United States from April 1971 through July 2008.¹⁰ The average inflation and mortgage

¹⁰Mortgage rates for conventional 30-year mortgages are from the Federal Reserve Bank of St. Louis and are available at <http://research.stlouisfed.org/fred2/series/MORTG/downloaddata?cid=114>. While there are many ways to measure inflation, we use the compounded rate of change of the Consumer Price Index (CPI) available from the same source. Our figure begins in April 1971 as that is the start of the mortgage rate series.

rates for the period from January 2000 through July 2008 were 3.2% and 6.5%, which are low in comparison to the experience since 1971 for which the averages were 4.7% and 9.2%, respectively.

So, it seems that our sample of homeowners lived in a time of low inflation and mortgage rates and also fell prey to money illusion. Did they believe their home values were out of line? Our respondents were asked to evaluate the current level of home prices in their community on an 11-point scale, labeled by 1 = too low, 6 = just about right and 11 = too high. The mean, median and modal responses were 6.0, which was labeled as housing prices being just right. We found that 60 respondents (or 42.6%) indicated 6.0. Moreover, 109 of 141 (77.3%) responded that prices were close to the appropriate level (responses of 5.0, 6.0 or 7.0). The evidence suggests that this sample of homeowners did not have unrealistic valuations of their homes, even with money illusion and in an atmosphere of low rates. Other evidence suggests that their valuations were reasonable even though many were willing to recommend buying a house that was outside their budget.

Did homeowners expect to make large gains in home values in the future? Respondents were also asked to assess the expected selling price of their home in relation to the purchase price at the current time, in one year and in five years. Their responses indicated that they expected, on average, price increases of 1.6% over the coming year and 2.86% per year over the next five years. These expectations seem very reasonable given that by one estimate home prices in the United States have historically grown at a real rate of 1.4% per year (Himmelberg, Mayer and Sinai 2005).

To provide additional bases for comparison, Table 2 reports realized housing price growth for the Atlanta metropolitan area, the state of Georgia and the U.S. Panel A reports percentage price changes prior to the survey implementation in September 2005 using the S&P/Case-Shiller Home Price Indexes (C-S) and the Federal Housing Finance Agency Purchase Only House Price Indexes (HPI).¹¹ The table includes observed growth rates for sample periods preceding the survey implementation, including the prior 3, 5, 10 and 14 years, with the available indexes beginning in 1991. The growth rates reported provide additional support for the conclusion that homeowners' price growth expectations were reasonable. Expectations of future growth of 1.6% over the next year and 2.86% over the next five years actually seem rather conservative compared to growth in prior years. Observed growth rates in the past 3, 5, 10 and 14 years ranged from 4.11% to 8.64% in Atlanta, Georgia, and the United States.

¹¹The C-S price index data are available at www.homeprice.standardandpoors.com and the HPI at <http://www.fhfa.gov/Default.aspx?Page=87>.

Table 2 ■ Housing price growth.

Panel A: Annual percentage price change from September of each starting year through September 2005

Starting year	Atlanta		Georgia		United States	
	C-S	HPI	C-S	HPI	C-S	HPI
1991	4.45	4.60	N/A	4.59	N/A	5.42
1995	4.95	5.25	N/A	5.13	N/A	6.38
2000	4.12	4.32	N/A	4.65	12.54	7.97
2002	4.11	3.79	N/A	4.57	14.22	8.64

Panel B: Annual percentage price change from September 2005 through September of each ending year

Ending year	Atlanta		Georgia		United States	
	C-S	HPI	C-S	HPI	C-S	HPI
2006	4.33	3.33	N/A	5.01	4.28	5.11
2007	2.31	1.78	N/A	3.11	-0.40	3.11
2008	-1.78	0.82	N/A	0.22	-6.44	-0.17

Note: The table reports realized housing price growth for the Atlanta metropolitan area, the state of Georgia and the United States. Panel A (B) reports percentage price changes prior to (succeeding) the survey implementation in September 2005 using the S&P/Case-Shiller Home Price Indexes (C-S) and the Federal Housing Finance Agency Purchase Only Housing Price Indexes (HPI).

Panel B of Table 2 allows us to benchmark expectations to actual growth with annual percentage price changes for September 2005, the time of the survey, through September of 2006, 2007 and 2008. One-year growth expectation for the sample of homeowners appears conservative. While five-year growth expectations surpass actual growth for the next couple of years, they do not seem to be out of line. In the summer of 2005, two professional real estate valuation providers rated home prices in Atlanta as fair, with one estimate indicating slight overvaluation and another slight undervaluation (Smith and Smith 2006). Using their own model, Smith and Smith (2006) conclude that prices in Atlanta were actually below fundamental values.

Who is More Reasonable?

In the previous sections we document money illusion among our sample of homeowners and while many of these homeowners also recommended buying a home with a price outside the family budget, money illusion did not translate into unreasonable expectations about the values of their homes in the future. In

this section, we investigate whether money illusion and price growth forecasts can be explained by measurable individual characteristics.

First we examined whether one- or five-year price growth forecasts were explained by numerous right-hand-side variables. We coded respondents as being prone to money illusion using the responses to Scenarios 1 and 2. For Scenario 1, we used simple dichotomous coding (1 = susceptible, 0 = not) for each question. For Scenario 2, we used several coding methods, including a stricter coding (1 = ranking in nominal terms of Carl, Ben and Adam and 0 = otherwise) and a less strict coding (1 = Carl ranked first and 0 = otherwise). We measured loss aversion using question c of Scenario 3 (1 = loss averse if chose Donna as doing better, 0 = otherwise). Impulsiveness was measured using the response to Scenario 4 regarding whether the couple should purchase the home, coded both as quasicontinuous and dichotomous (1 = impulsive if response is scale midpoint or greater, 0 = otherwise).

Univariate tests comparing one- and five-year growth rates for each group indicated no significant differences in forecasts across groups (*i.e.*, *p*-values in excess of 0.10). We also used univariate tests to compare the degree of money illusion, loss aversion and impulsiveness across groups and found only one significant difference. For Scenario 2, there is evidence of stronger money illusion among women than men ($p = 0.01$ with the strict coding and $p = 0.079$ with the less strict coding).

We also examined correlations between the variables. A significant association was found between responses to Scenarios 2 and 3 ($p = 0.013$). The only other association was between money illusion as measured by changing jobs (Scenario 1, question 3) and loss aversion, but this was marginally significant at $p = 0.09$.

Finally, we estimated regressions of one- and five-year growth forecasts on money illusion, loss aversion, impulsiveness and demographic variables, including age, gender and household income. The results (untabulated) indicate that growth forecasts cannot be predicted by any of the included variables. Thus, what makes a more reasonable forecaster is not easily predictable. But the result reinforces our earlier assessment that, despite the presence of money illusion, respondents' expectations of future home values are very reasonable. In other words, we do not find any association between money illusion (or loss aversion or impulsiveness) and expectations of home prices.

Discussion and Concluding Remarks

This article reports homeowners' responses to a survey designed to measure the extent of money illusion as well as homeowners' expectations regarding home

valuations. We find that our survey respondents suffer from money illusion, yet they have reasonable expectations of home prices. Importantly, when asked to focus on the economics of a situation, our respondents ranked outcomes in terms of real values. However, when asked to make a more emotional evaluation, such as who was “happier” or did “better,” decisions are consistent with affective evaluations based on nominal rankings.

Given that our sample of homeowners resided in an area of relatively low mispricing, what can we conclude about housing price bubbles in other regions of the United States? While we cannot rule out a role for money illusion, our evidence suggests that low inflation and money illusion are not sufficient conditions for homeowners to generate unrealistic expectations about home values. The responses of our sample of homeowners indicate that they think in terms of nominal, rather than real, valuations. The time period is one characterized by low inflation and mortgage rates. Yet, the majority believed their home valuations to be close to fair value and did not expect extremely high valuations in the future. Our results are consistent with the use of emotional evaluations (System 1 processing) when an affective response is triggered, resulting in choices based on nominal valuations and money illusion. Yet, when a context triggers rational, deliberative thinking, evaluations are reasonable. When we asked respondents to consider the current value of the homes in their own community, the context may have promoted conscious deliberation (System 2 processing).

The relationship between money illusion and mispricing is subtle and multifaceted. When people buy a home or invest in real estate, they are likely to use System 2 processing with emotional responses being less likely. At the same time, some housing markets may be subject to extreme mispricing due to “a perfect storm” created by a confluence of factors. Supply and demand each play important roles. The literature has documented the importance of fundamental factors.¹² The metropolitan areas with the largest price run-ups tend to have limited land available for expansion due to geography, such as coastal cities (*e.g.*, Los Angeles, Boston and Miami). On the demand side, loose lending practices tied with low mortgage rates are contributors. Money illusion could add to the mania on both the demand and supply sides, as home buyers bid up prices and developers over-build. All of these fundamental and behavioral factors play a part in the outcome, but it is unlikely that any one is a determining factor.

¹²See, for example, Himmelberg, Mayer and Sinai (2005) who question whether there was a housing price bubble at all in 2004. As they point out, a decline in prices is not adequate evidence that a bubble existed in the past because a real shift in fundamentals may have been the spur.

The views expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Atlanta or the Federal Reserve System. We thank the Federal Reserve Bank of Atlanta for financial support, Bruce Bryant and Tyler Vansant for insight into the Atlanta housing market, the Homeowners Association for their support in implementing our research, Petra Halling and an anonymous referee for helpful comments and Aey Chatupromwong, Kyuseok Lee, Ong-Ard Singtokul and Hui (Helen) Xu for valuable research assistance.

References

- Brunnermeier, M.K. and C. Julliard. 2008. Money Illusion and Housing Frenzies. *Review of Financial Studies* 21(1): 135–180.
- Case, K.E. and R.J. Shiller. 1989. The Efficiency of the Market for Single-Family Homes. *American Economic Review* 79(1): 125–137.
- Case, K.E. and R.J. Shiller. 2003. Is There a Bubble in the Housing Market? *Brookings Papers on Economic Activity* 2: 299–362.
- Cohen, R.B., C. Polk and T. Vuolteenaho. 2005. Money Illusion in the Stock Market: The Modigliani-Cohn Hypothesis. *Quarterly Journal of Economics* 120(2): 639–668.
- Evans, J.St.B.T. 2008. Dual-Processing Accounts of Reasoning, Judgment, and Social Cognition. *Annual Review of Psychology* 59: 255–278.
- Gino, F., D.A. Moore and M.H. Bazerman. 2009. No Harm, No Foul: The Outcome Bias in Ethical Judgments. Harvard Business School Working Paper 08-080. Cambridge, MA.
- Glaeser, E.L., J. Gyourko and A. Saiz. 2008. Housing Supply and Housing Bubbles. Harvard University Working Paper. Cambridge, MA.
- Himmelberg, C., C. Mayer and T. Sinai. 2005. Assessing High House Prices: Bubbles, Fundamental and Misperceptions. *Journal of Economic Perspectives* 19(4): 67–92.
- Shafir, E., P. Diamond and A. Tversky. 1997. Money Illusion. *Quarterly Journal of Economics* 112(2): 341–374.
- Smith, M.H. and G. Smith. 2006. Bubble, Bubble, Where's the Housing Bubble? *Brookings Papers on Economic Activity* 1: 1–67.
- Thaler, R.H. 1999. Mental Accounting Matters. *Journal of Behavioral Decision Making* 12: 183–206.

Appendix

We have replaced the community name with XXXX.

Housing Questionnaire

To complete this questionnaire, you must be a XXXX homeowner (only one per home) and you must actively participate in household financial decisions.

1. What is your gender? _____ male _____ female

2. What is your age? _____ years

3. Is your home currently for sale? _____ yes _____ no

4. How much did your home cost?

_____ \$0-\$100,000 _____ \$100,001-\$200,000

_____ \$200,001-\$300,000 _____ \$300,001-\$400,000

_____ \$400,001-\$500,000 _____ More than \$500,000

5a. When did you purchase your home? _____ month _____ year

5b. Is it the first home you have purchased? yes _____ no _____

5c. If no, how many prior homes have you purchased? _____ homes

6. How was the purchase of your home financed?

_____ fixed-rate mortgage _____ adjustable-rate mortgage

_____ interest-only mortgage _____ home is paid for

If other, please explain. _____

7. How would you characterize the current level of housing prices in XXXX?

Too low Just Right Too high

1—2—3—4—5—6—7—8—9—10—11

8. If you sold your home *today*, what is the expected selling price in relation to the price at which you purchased?

Lower No change Higher

100%- -80%- -60%- -40%- -20%- -0%- -20%- -40%- -60%- -80%- -1 ≥ 100%

9. If you sold your home in *one year*, what is the expected selling price in relation to the price at which you purchased?

Lower No change Higher

100%- -80%- -60%- -40%- -20%- -0%- -20%- -40%- -60%- -80%- -≥100%

10. If you sold your home in *five years*, what is the expected selling price in relation to the price at which you purchased?

Lower No change Higher

100%- -80%- -60%- -40%- -20%- -0%- -20%- -40%- -60%- -80%- -≥100%

Background information on types of mortgages: Today's market offers three broad types of mortgages: fixed-rate, adjustable-rate and interest-only. A fixed-rate mortgage locks in an interest rate, whereas adjustable-rate and interest-only loans allow the interest rate to vary for a period of time and then lock in a rate. For fixed-rate and adjustable-rate mortgages, monthly payments go toward the loan balance and interest—the outstanding loan balance declines over time. For interest-only loans, monthly payments for an initial period only go toward interest—the outstanding loan balance does not decline. But, monthly payments often are substantially lower for interest-only loans.

11. Assume that today you are purchasing a new home in XXXX and you have the opportunity to finance the purchase using a fixed-rate mortgage, an adjustable-rate mortgage, or an interest-only mortgage. *For each of the following, please check the type of mortgage that you would prefer to use to finance your purchase.*

a. Housing prices in XXXX are expected to rise in the future.

_____ fixed-rate _____ adjustable-rate _____ interest-only

b. Housing prices in XXXX are expected to fall in the future.

_____ fixed-rate _____ adjustable-rate _____ interest-only

c. Housing prices in XXXX are expected to remain unchanged in the future.

_____ fixed-rate _____ adjustable-rate _____ interest-only

12. Please rank the following in terms of importance when financing the purchase of a new home. Assign a "1" to the feature that is most important, a "2" to the feature that is next most important, and so forth.

- _____ Length of Mortgage
- _____ Interest Rate on Mortgage
- _____ Monthly Payment
- _____ Total Loan Amount
- _____ Expected Increase in New Home Prices

13. Consider two individuals, Ann and Barbara, who graduated from the same college a year apart. Upon graduation, both took similar jobs with publishing firms. Ann started with a yearly salary of \$50,000. During her first year on the job there was no inflation, and in her second year Ann received a 2% (\$1,000) raise in salary. Barbara also started with a yearly salary of \$50,000. During her first year on the job there was 4% inflation, and in her second year Barbara received a 5% (\$2,500) raise in salary.

a. As they entered their second year on the job, who was doing better in economic terms?

_____ Ann _____ Barbara

b. As they entered their second year on the job, who do you think was happier?

_____ Ann _____ Barbara

c. As they entered their second year on the job, each received a job offer from another firm. Who do you think was more likely to leave her present position for another job?

_____ Ann _____ Barbara

14. Donna and Jill each acquired similar new homes for \$175,000. Both obtained a mortgage for \$150,000 at the time of purchase.

- Donna obtained a fixed-rate mortgage. Over five years she made monthly payments totaling \$48,000 (\$800 per month $\times$ 60 months). The outstanding loan balance is \$138,000 at the end of five years.
- Jill obtained an interest-only mortgage. Over five years she made monthly payments totaling \$36,000 (\$600 per month $\times$ 60 months). The outstanding loan balance is \$150,000 at the end of five years.

Donna and Jill are now selling their homes. Assume that over the five years interest rates have not changed.

a. Donna and Jill each sell their home for \$215,000. As a result, Donna walks away with cash of \$77,000, whereas Jill walks away with cash of \$65,000. Who has done better on the sale of her home? *Check the one who has done better.*

_____ Donna _____ Jill _____ Donna and Jill have done equally well

b. Who is happier as a result of the sale transaction described in (a)?

_____ Donna _____ Jill _____ Donna and Jill are equally happy

c. Now assume that Donna and Jill each sell their home for \$140,000. As a result, Donna walks away with \$2,000 in cash, whereas Jill has to pay \$10,000 in cash. Who has done better on the sale of her home? *Check the one who has done better.*

_____ Donna _____ Jill _____ Donna and Jill have done equally well

d. Who is happier as a result of the sale transaction described in (c)?

_____ Donna _____ Jill _____ Donna and Jill are equally happy

15. Consider the following. Jane and John Doe currently rent an apartment, but have been saving in hopes of buying their first home. The couple determined, based on a personal assessment of their financial affairs, that they have the means to purchase a \$200,000 home. They determined that \$200,000 is the most that they should spend. After spending countless hours looking, the Doe's identified a new home that has everything that the couple wants and needs: the house is perfect. Unfortunately, the new home costs 25% more than the couple planned to spend: the price of the new home is \$250,000. The couple, however, has qualified for a mortgage to finance the new home—so there are no obstacles preventing the purchase.

a. Should the couple purchase the new home?

Definitely Do		Definitely
Not Purchase	Don't Know	Purchase

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11

b. Assume that the Doe's qualified for a fixed-rate mortgage as well as an interest only mortgage. Which type of mortgage should the Doe's use to finance the purchase of the new home?

_____ fixed-rate mortgage _____ interest-only mortgage

16. Consider the following. Adam, Ben and Carl each received an inheritance of \$200,000, and each used it immediately to purchase a house. Suppose that each of them sold the house a year after buying it. Economic conditions, however, were different in each case.

- When Adam owned the house, there was 25% deflation—the prices of all goods and services decreased by approximately 25%. A year after Adam bought the house, he sold it for \$154,000 (23% less than he paid).
- When Ben owned the house, there was no inflation or deflation—the prices of all goods and services had not changed significantly during that year. He sold the house for \$198,000 (1% less than he paid for it).
- When Carl owned the house, there was 25% inflation—the prices of all goods and services increased by approximately 25%. A year after he bought the house, Carl sold it for \$246,000 (23% more than he paid).

Please rank Adam, Ben and Carl in terms of the success of their house transactions. The person assigned a “1” made the best deal and a “3” the worst deal.

_____ Adam

_____ Ben

_____ Carl

17. What is your total household income?

_____ \$0–\$100,000

_____ \$100,001–\$200,000

_____ \$200,001–\$300,000

_____ \$300,001–\$400,000

_____ \$400,001–\$500,000

_____ More than \$500,000

18. Does anyone in your household work in the following occupations? *Check all that apply.*

_____ Real Estate Agent _____ Lending Related (e.g., loan officer, mortgage broker)

_____ Home Builder _____ Other Home Related (Specify) _____

_____ None Apply (check if nothing else is checked)

19. In your home, how would you characterize your role in household financial decisions?

_____ I am the primary decision maker

_____ I am a secondary decision maker

_____ I share the decision making equally with another

_____ Other (explain) _____

COPYRIGHT INFORMATION

Author: Ackert, Lucy F.; Church, Bryan K.; Jayaraman, Narayanan

Title: Is There a Link Between Money Illusion and Homeowners' Expectations of Housing Prices?

Source: Real Estate Econ 39 no2 Summ 2011 p. 251-75

ISSN: 1080-8620

DOI:10.1111/1.1540-6229.2010.00295.x

Publisher: American Real Estate and Urban Economics Association (AREUEA)
P.O. Box 9958, Richmond, VA 23228

The magazine publisher is the copyright holder of this article and it is reproduced with permission. Further reproduction of this article in violation of the copyright is prohibited. To contact the publisher: <http://www.areuea.org/>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden. The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.