An Exploratory Conjoint Analysis of Millennial Tradeoff Preferences in Increasing Sustainable Materials Use in US Homebuilding

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Abstract

There is a high interest in the United States in the exploration of increasing sustainable materials use in US residential homebuilding. One of the fastest growing segments of home buyers in the US are millennials [1]. There are no precise dates for when this cohort starts or ends; demographers and researchers typically use the early 1980s as starting birth years and the mid-1990s to early 2000s as ending birth years). This paper examines the tradeoff preferences of millennial home buyers between six factors in single family residential homes: Price, Average Commute Time to Work, Number of Bedrooms, and Number of Bathrooms, Lot Size, and "Green" house features. "Green" house features include items such as solar panels and reduced carbon footprint. Conjoint analysis is an established marketing research technique to measure tradeoff preferences of consumers and is ideal for this type of research study of real estate factor tradeoff preferences.

A data collection instrument was developed that was administered to 107 business students. The respondents are within the millennial age range and were asked to identify self stated ranking of importance of the six factors and then were asked to rate 18 profiles of various house designs on the six factors from 1st to 18th.

An analysis was conducted on the tradeoff preferences of higher price for a home from lower costs with the use of less sustainable materials and higher costs for a home with increased use of sustainable materials in homebuilding. There is an examination of differences in tradeoff preferences based on gender and by class level. The paper's preliminary results have implications for home builders and the follow up paper on secondary data analysis planned will offer more insights on tradeoff preferences at the attribute level for each factor.

Background and Procedures

There is a high interest in the United States in the exploration of increasing sustainable materials use in US residential homebuilding. The US Green Building Association identified in a recent October 2017 article on the organization's website the importance of green home building techniques:

"LEED: (Leadership in Energy and Environmental Design) homes are green homes, and they are transforming the residential market and people's lives around the world. LEED homes are built to be healthier and safer by providing cleaner indoor air. They use less energy and water, leading to monthly savings on utilities, and maintain their value over time. More than 370,105 residential units have earned LEED certification as of October 2017, and both certified single-family homes and multi-family projects are selling faster and for more money than comparable, conventional homes. Since 2005, the green share of new single family residential construction has grown dramatically-increasing from 2 percent in 2005 to 23 percent in 2013. This 23 percent market share equates to a $36 billion market opportunity, according to a study on green labels in the California housing market [2].

One of the fastest growing segments of home buyers in the US is millennials [1]. There are no precise dates for when this cohort starts or ends; demographers and researchers typically use the early 1980s as starting birth years and the mid-1990s to early 2000s as ending birth years). According to a recent study by the National Association of Realtors, millennials make up the largest segment of first time home buyers.

Millennials make up the largest group of first-time home buyers at 66%, followed by Generation X at 26% [3]. This paper examines the tradeoff preferences of millennial home buyers between six factors in single family residential homes: Price, Average Commute Time to Work, Number of Bedrooms, and Number of Bathrooms, Lot Size, and "Green" house features. "Green" house features include items such as solar panels and reduced carbon footprint. Conjoint analysis is an established marketing research technique to measure tradeoff preferences of consumers and is ideal for this type of research study of real estate factor tradeoff preferences.

A data collection instrument was developed (see Appendix A) that was administered to 105 business students; 85 undergraduate and 20 graduate students. The respondents are within the millennial age range and were asked to identify self stated ranking of importance of the six factors and then were asked rank order profiles of various house designs with different levels or attributes on the six factors. The Total possible number of profiles is equal to 486 (3 x 3 x 3 x 3 x 3 x 2). With a conjoint analysis factorial profile design not all possible profiles needed to be presented from the factors and attributes and only 18 profiles were required to determine attribute and factor importance.

Factors and Levels/Attributes Listing:

- Price: $600,000 $900,000 $1,200,000
- Daily Work Commute: less than 20 minutes   21-40 minutes more than 40 minutes
- Number of Bedrooms: 2   3   4

- Number of Bathrooms: 1   2   3
- Lot Size: Small   Medium   Large
- Green: Yes   No

Data Analysis and Preliminary Results

This paper presents the preliminary data analysis results on the tradeoff preferences of higher price for a home from lower costs with the use of less sustainable materials and higher costs for a home with increased use of sustainable materials in homebuilding. This paper also presents results from an analysis of differences in tradeoff preferences based on gender and by class level. This preliminary paper does not present the results of the second page of the survey 1st to 18th rankings by home profile plans by respondents.

IBM SPSS Version 24 was used to analyze the following:

A total of 107 respondents with the following breakdown:

- By Class Level:
- Undergraduates: 85
- Graduates: 22
- By Gender:
- Females: 57
- Males: 50

A univariate analysis of the means of self-ranked importance on the six factors; the following are the six factors in rank order from the respondents:

- Price: 1.53 [on a scale of 1 being 1st in importance to 6 being least in importance]
- Daily Work Commute Time: 2.77
- Number of Bedrooms: 3.10
- Lot Size: 4.04
- Number of Bathrooms: 4.31
- Green Home Building: 5.23

In a secondary follow up to this paper additional data analysis is planned with bivariate analysis of the means of self-ranked importance on the six factors to see if class level or gender made in a difference in the rank ordering of the 6 factors.

The key focus of this paper was to see the results on the following question in the survey:

Respond to the following statement:

I would be willing to pay a higher price for a home that is more "Green."

[   ] Strongly Agree   [   ] Agree   [   ] Neutral   [   ] Disagree   [   ] Strongly Disagree

For this question, coding was 5 (strongly agree) to 1 (strongly disagree):

- All Respondents: 3.23
- By Class Level:
- Graduate Students: 3.409
- Undergraduate Students: 3.185

The results were surprising as it was expected that the younger undergraduate students would have more willingness to pay for green home building features compared to older graduate students. A Chi-square analysis was performed with a cross-tabulation of class level and willingness to pay more for a green home. The Pearson Chi-square value was calculated as 90.944 with significance at the .000 level.

- All Respondents: 3.23
- By Gender:
- Female: 3.32
- Male: 3.14

The results were not surprising as it was expected that females would have more willingness to pay for green home building features than males. A Chi-square analysis was performed with a cross-tabulation of class level and willingness to pay more for a green home. The Pearson Chi-square value was calculated as 90.944 with significance at the .000 level.

References

1.   www.wikipedia article on Millennials age range.
2.   www.USGBA.org article "About Green Homes" October 2017.
3.   www.nar.org NAR Home Buyer and Seller Generational Trends Report 2017 & 2016 Profile of Home Buyers and Sellers.