NATIONAL HOUSING SURVEY

What Motivates Borrowers to Refinance?

Past Refinancing Behavior and Future Refinancing Intent

National Housing Survey Topic Analysis
February 2014

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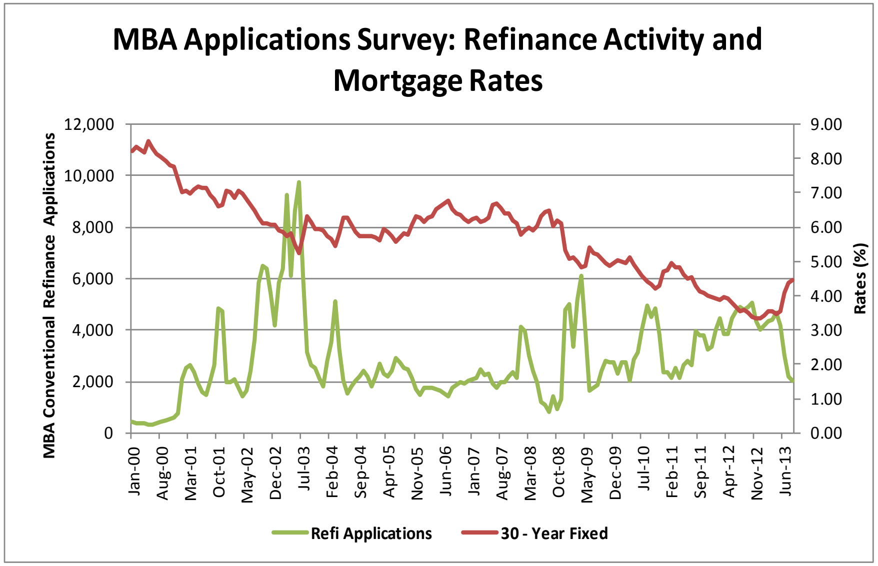
BACKGROUND

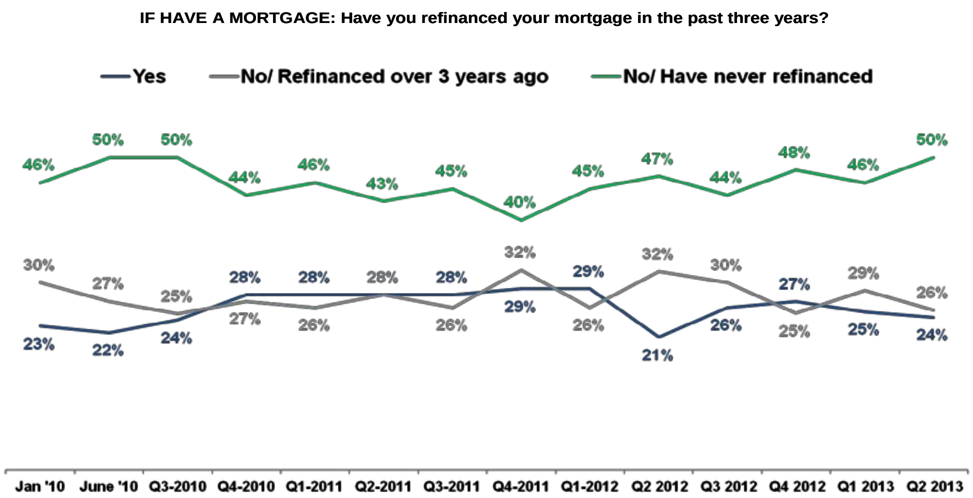
Although mortgage rates fell recently to historic lows, nearly one half of borrowers say they have not refinanced their current home

- The monthly average for 30-year fixed mortgage rates reached its all-time low at 3.5% in Nov. and Dec. 2012, since 1971 when this data began to be collected. The monthly average was 4.19% in Oct. 2013, compared to 6.20% in Oct. 2008.*

- The Fannie Mae National Housing Survey found that 40% to 50% of borrowers have not refinanced the mortgage on their current home. Only 25% to 30% say they have refinanced in the past three years during a period of steadily declining interest rates.

- Fed analysis from 2001 and 2002 shows similar findings that about half of homeowners with mortgages refinanced at least once after buying their homes.**





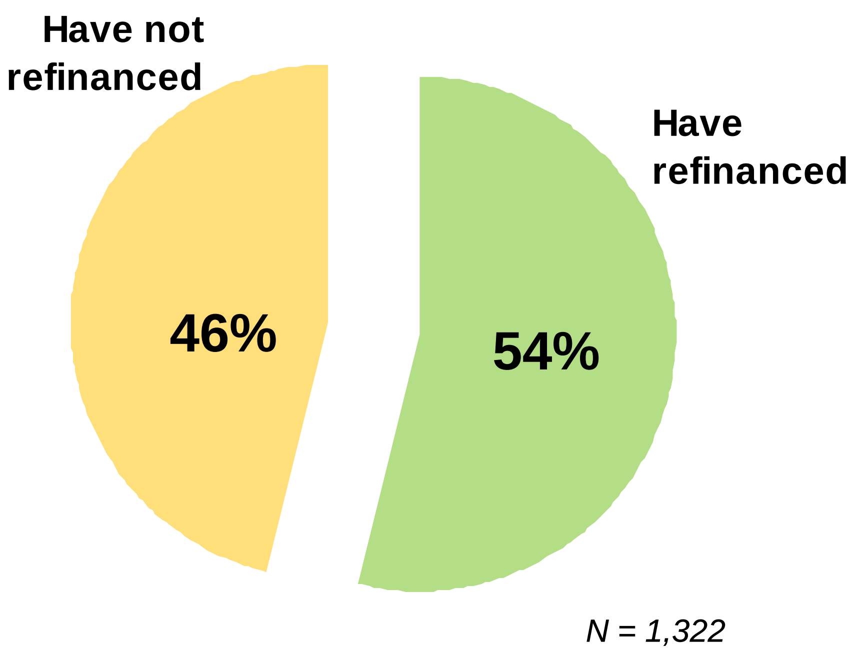
* Actual monthly average 30-year fixed mortgage rate from Freddie Mae Primary Mortgage Market Survey® (PMMS®)

***Glenn Canner, Karen Dyman and Wayne Passmore, "Mortgage Refinancing in 2001 and Early 2002" Federal Reserve Bulletin, December 2002.*

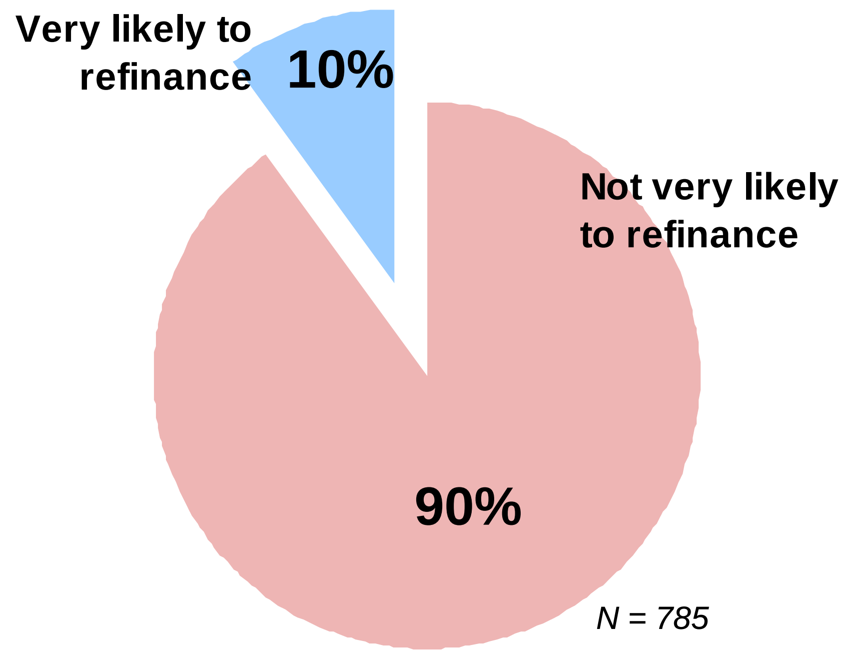
OBJECTIVE

Borrowers' past refinancing behavior and future refinancing intent are the key interest variables of this study

Have you ever refinanced the mortgage on your current home?
(*Among All Mortgage Holders*)



How likely are you to refinance the mortgage on your primary home in the next 12 months?
(*Among those who obtained their most recent mortgage (purchase or refinance) more than 3 years ago*)



"Ever Refinanced" variable is a binary, Yes or No, question. "Likelihood to Refinance" is originally on a 4-point scale and recoded into a binary variable of which the top choice of "Very likely" is recoded into the "Very likely to refinance" group, and the bottom three choices of "Somewhat likely," "Not very likely," and "Not at all likely" are recoded into the "Not very likely to refinance" group.

This study conducts analyses from different angles to examine why nearly half of borrowers have not refinanced their current home

Descriptives Analysis

- Are there any differences in terms of demographics and financial attitudes between those who have not refinanced the mortgage of their current homes and those who have?
- What are borrowers' key Refinancing Barriers?

Advanced Multivariate Analysis

- What are the key factors associated with borrowers' refinancing behavior in the past?
- What factors primarily drive borrowers' refinancing intent in the next 12 months?

EXECUTIVE SUMMARY

Descriptives Analysis

- **"Not reduce payments enough," "closing costs too high," and "not want to lengthen loan terms" are the most common barriers cited as the key barriers to refinance**

- **Borrowers who have not refinanced the mortgage of their current homes appear to:**
  - Be younger, own homes for shorter periods of time
  - Have lower income and education

- **Some borrowers have "tried" to refinance in the past, but were unsuccessful. They appear to:**
  - Exhibit higher financial anxiety
  - Be more pessimistic about their future financial situation and the overall economy
  - Think that it would be difficult for them to get a mortgage today

- **For those "Tried but Unsuccessful" borrowers, qualification, lenders' unwillingness, and the need to put down more money to make up lost home value also are key barriers that they have faced**
  - The need to put down more money to cover the lost home value is a misperception, since the government's Home Affordable Refinance Program (HARP) provides opportunities for underwater borrowers to refinance
  - Many borrowers reported that the lenders they contacted would not refinance them

Advanced Analysis

Past refinancing behavior is mostly associated with demographics and declining mortgage rates. Mitigating financial risk is the key driver motivating *future* refinancing intent.

*Past Refinancing**

Life Cycle Factors

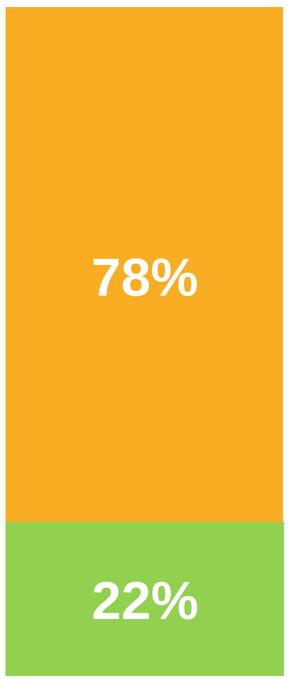
More years in home

Marriage

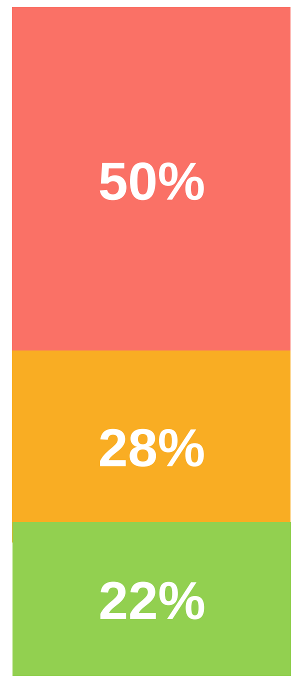
Higher education level

Opportunity Factors

*Declining mortgage rates***



*Refinancing Intent**



Risk Mitigation Factors

Stress about ability to make debt payments

Having tried to refinance in the past, but unsuccessful

Expect financial situation to get better

Life Cycle Factors

Higher income level

Opportunity Factors

Perceived ease to get a mortgage today

* Risk-Mitigation factors are excluded from the Past Refinancing model since these factors reflect *current* attitudes and finances that existed AFTER the refinancing behavior occurred. The Refinancing Intent model excludes respondents who obtained their most recent mortgage on their home (purchase or refinance) in the past three years. Given the past three years' historic low rates, this population is less likely to refinance in the future. The Refinancing Intent model based on the total mortgage-holders sample yielded similar results, but a less robust model in terms of model performance. Please see Appendix for details.

** Two-year moving average based on the annualized 30-year fixed mortgage rates from Freddie Mae Primary Mortgage Market Survey® (PMMS®) is derived and appended to each respondent's survey responses and matched to the most recent year the respondent reported purchasing or refinancing the mortgage on their home.

Please see Appendix for the detailed results of logistic regression models.

DISCUSSION / IMPLICATIONS

Discussion / Implications

- Financial education, awareness, and messaging is critical to encourage refinancing.
- Additional research is needed to explore the influences of other factors not examined in this study.

Key Findings		Discussion/Implications
• Misperception of the need to put more money down to make up for the loss of home value, rejection from lenders, and homeowners' ability to qualify are key refinancing barriers for those who have attempted to refinance in the past. • Borrowers' perceived ease of getting a mortgage significantly drives their intent to refinance in the future.	➡	• Overcoming these barriers and misperceptions through education and messaging is critical to increasing the number of mortgage borrowers who benefit from refinancing. • HARP (Home Affordable Refinancing Program) is designed to help underwater borrowers to refinance. Elevating awareness about HARP could help motivate underwater borrowers to explore their options.
• Mortgage borrowers who have not refinanced are more likely to be younger, first-time homebuyers with lower income and less education. In contrast, older, higher educated consumers who have owned homes longer are more likely to have refinanced.	➡	• It's likely that older borrowers with higher education and income are more financially capable of refinancing or are more financially literate and confident. Resources that help consumers to be more financially literate and confident may help motivate more borrowers to refinance.
• The perception of not-enough savings is a top refinancing barrier. This could be driven by borrowers' situational factors. For example, borrowers who are planning to move soon might find that the closing costs exceed the potential savings.	➡	• Further research is needed to provide deeper insights into the roles other factors, including situational and emotional factors, play on borrowers' refinancing intent and behavior.

METHODOLOGY

Methodology

- Telephone survey data collected via the National Housing Survey (NHS) from January 2013 to March 2013 are used for this analysis.
  - A total of 3,015 phone interviews were conducted among the general population. Among these, 1,960 are homeowners,995 are renters, and 60 are boarders. The sample in this analysis includes only homeowners with mortgages, so-called “mortgage holders” (n = 1,327). Homeowners without mortgages (n = 633) were dropped from this analysis.
  - For the Refinancing Intent model presented, the sample excludes respondents who obtained their most recent mortgage (purchase of refinance) during the past 3 years, a time period when mortgage rates had been near historical lows. Analysis indicates that respondents who got their most recent mortgage in the past three years less often reported being likely to refinance their mortgage in the next 12 months. (The model based on the total sample of mortgage holders yields similar results, but is a less robust model in terms of model performance.)
  - Multivariate logistic regression models were conducted to identify key factors that associate with the status of having refinanced in the past and factors that drive refinancing intent in the next 12 months.
  - Standardized regression coefficients are converted into “percentage of importance" for each model to allow easy comparisons of coefficients.
  - Additional descriptive statistics and Latent Class Analysis (LCA) were used to help focus the analyses.

For more information about the NHS, see http://www.fanniemae.com/portal/research-and-analysis/housing-quarterly.html.
Telephone surveys were conducted by Penn Schoen and Berland. Analysis was conducted by IPSOS in partnership with Fannie Mae.
For the details of the sample, please see Appendix.
For the detailed results of logistic regression models and the LCA analysis, please see Appendix.
“Percentage of Importance” is calculated by standardizing all coefficients and calculating the percent explanatory power for each standardized coefficient. For more information, please see Appendix.

Variables (Factors) are grouped into three categories:

Life Cycle

- *Age*
- *Marital Status*
- *Income*
- *Education Level*
- *Children in Household*
- *Years in Home*

Opportunity

- *Perceived Ease of Getting Mortgage Today*
- *Mortgage Rate Regime (for the most recent mortgage) (declining, stable, or rising)***

Risk Mitigation*

- *Stress About Making Debt Payments*
- *Expect Finances to Improve*
- *Concern About Job Loss*
- *Perceived Underwater Status*
- *Belief that Owning is Risky Investment*
- *Tried to Refinance but Unsuccessful*

Decision to Refinance

* Risk-Mitigation factors are excluded from the Past Refinancing model since those factors reflect *current* attitudes and finances that existed AFTER the refinancing behavior occurred. The Refinancing Intent model excludes respondents who obtained the most recent mortgage on their home (purchase or refinance) in the past three years. Given the past three years' historic low rates, this population is unlikely to refinance in the future.

** Two-year moving average of the annualized average 30-year fixed mortgage rates from Freddie Mae Primary Mortgage Market Survey® (PMMS®) is derived and appended to each respondent's survey responses and matched to the most recent year the respondent reported purchasing or refinancing the mortgage on their home.

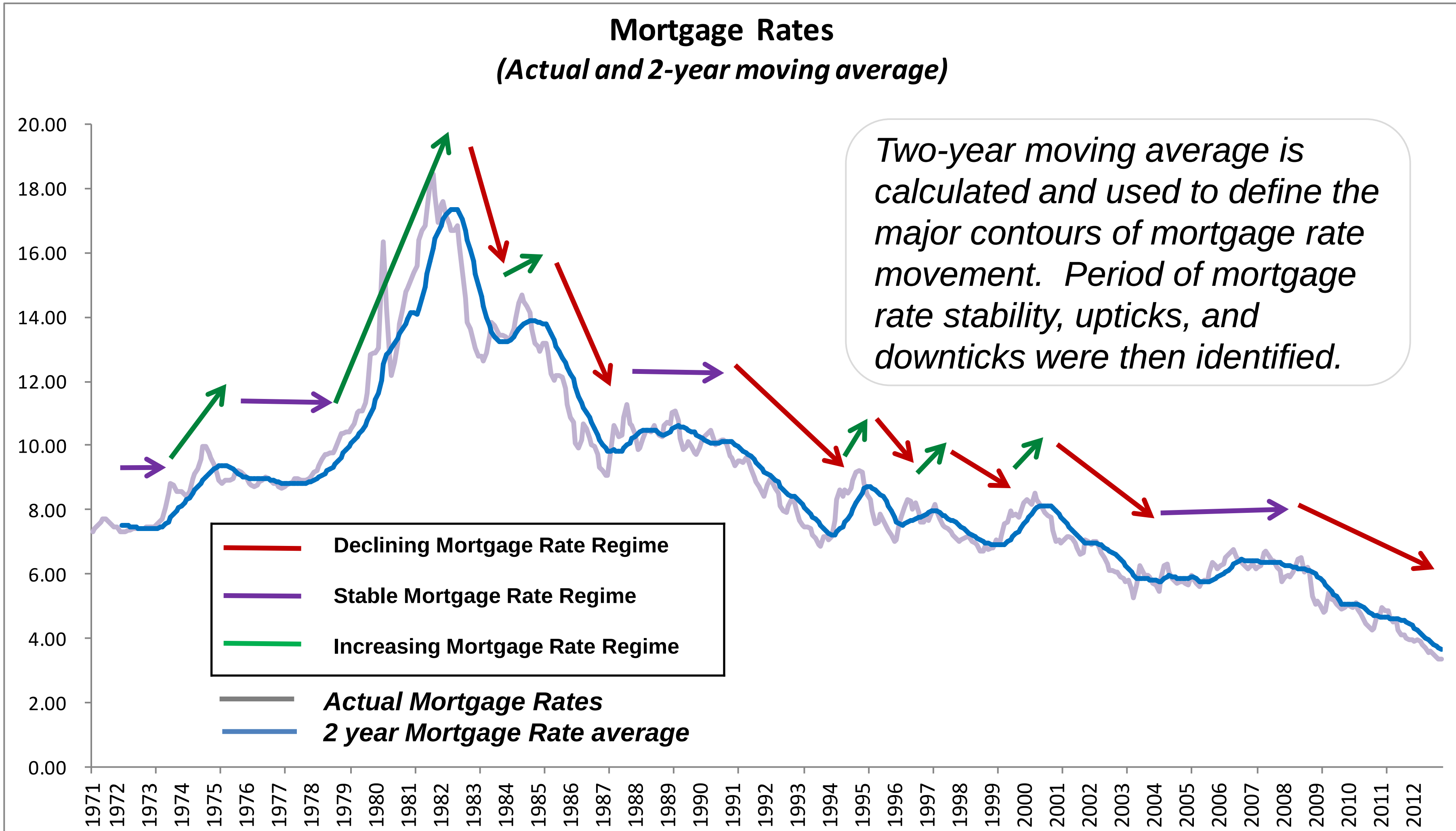
Definitions of Key Variables

Life Cycle Factors | Opportunity Factors | Risk Mitigation Factors

Variable and Description	
Age	Age of respondent
Marital Status	Currently married or have a partner
Income	Total household income before taxes for 2012
Education Level	Last grade completed
Children in Household	Number of children under age 18 currently living in household
Years in Home	Number of years in the current home
Perceived Ease of Getting Mortgage Today	Believe that it is easy for respondent to get a home mortgage today
Mortgage Rate Regime*	30-year fixed mortgage interest rates were declining, stable, or rising, defined by 2-year moving average, when the most recent mortgage was obtained (purchase or refinanced). See details on the next page.
Perceived Underwater Status	Extent to which total amount owed on mortgage is more than the current value of home
Concern About Job Loss	Level of anxiety about losing job in next 12 months
Expect Finances to Improve	Extent to which personal financial situation will become better or worse in the next year
Stress About Making Payments	Amount of stress about ability to make payments on debts
Tried to Refinance, but Unsuccessful	Have not refinanced on current home, but have tried to refinance in last 2-3 years
Believe that Homeownership is a Risky Investment	Believe that buying a home is a risky investment (compared to a safe investment)

* Actual annualized average 30-year fixed mortgage rate from Freddie Mae Primary Mortgage Market Survey® (PMMS®) is appended to each respondent's survey responses and matched to the most recent year the respondent reported purchasing or refinancing the mortgage on their home.
Please see Appendix for detailed variable questions and coding.

"Mortgage Rate Regime" variable is derived to indicate Declining, Stable, or Increasing rate environment when the most recent mortgage was obtained



Annualized average rates were derived from Freddie Mac's Primary Mortgage Market Survey® (PMMS®) conventional, conforming 30-year fixed-rate mortgage series since 1971. The annualized average rate is appended to each respondent's survey responses and matched to the most recent year the respondent reported purchasing or refinancing the mortgage on their home.

KEY FINDINGS

(1) Descriptives Analysis

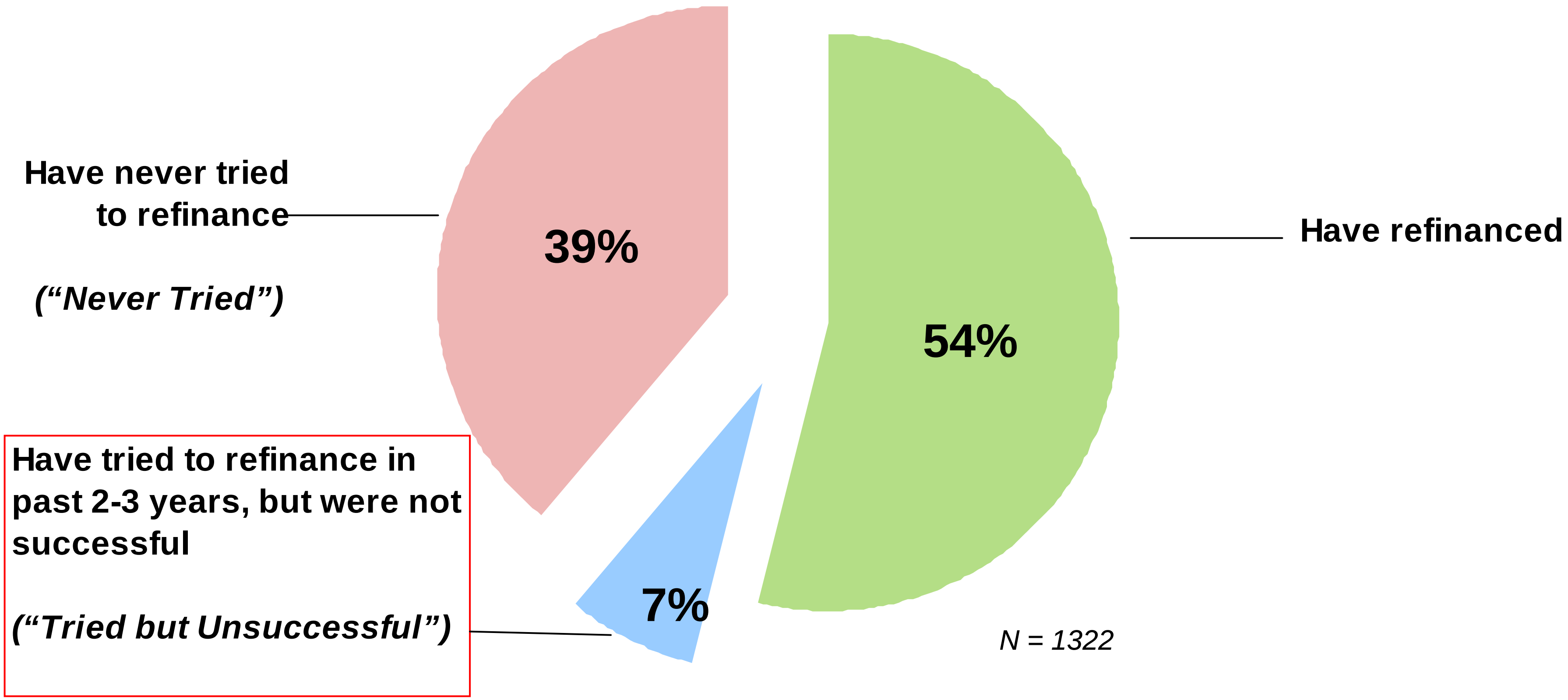
(2) Past Refinancing Model

(3) Refinancing Intent Model

Descriptives Analysis

Nearly 50% of respondents have not refinanced the mortgage on their current home

Past Refinancing Behavior
(Among All Mortgage Holders)



Question: "Have you ever refinanced the mortgage on your current home?" Yes or No.
If no, "Have you tried to refinance your mortgage in the past 2-3 years?" Yes or No.

"Never Tried" tend to be younger than Refinancers and have lower income and education

Demographics	Have Refinanced	Not Refinanced: Never Tried	Not Refinanced: Tried but Unsuccessful†
Employed full time	81%	84%	83%
White / Caucasian*	**70%**	**62%**	70%
College degree	**45%**	**35%**	36%
Age 40+	**74%**	**58%**	**63%**
Married	**85%**	**76%**	81%
Kids under 18 at home	**38%**	**48%**	46%
Household Income $50K+	**76%**	**64%**	**80%**

N = 713 for "Have Refinanced" (54%); N = 516 for "Never Tried" (39%); N = 93 for "Tried but Unsuccessful" (7%)

† "Tried but Unsuccessful" are individuals who indicated that they have not refinanced the mortgage on their home since purchase, but have tried to refinance in the past 2-3 years.

* Ethnicity was recoded into a binary variable: White/Caucasian vs. all others (including African Americans, Hispanics, Asians, Middle Easterners, American Indians, and Pacific Islanders).

Underlined percentages are statistically different than the percentage of the "Have Refinanced" group (at 95% confidence level). Boxed percentages differ significantly between the "Never Tried" and the "Tried but Unsuccessful" groups (at 95% confidence level).

"Never Tried" have owned homes for shorter period than Refinancers. "Tried but Unsuccessful" are more likely to be underwater than Refinancers.

Homeownership	Have Refinanced	Not Refinanced	
		Never Tried	Tried but Unsuccessful†
First Time Homebuyer	46%	56%	45%
Owned Home 5+ years	90%	$\boxed{56\%}$	$\boxed{82\%}$
Have a Fixed-Rate Mortgage	91%	85%	83%
Average Mortgage Interest Rate+ (Not % of those surveyed)	5.02%	5.99%	6.23%
Perceived Underwater Status	25%	25%	32%
Home is worth less than what was paid	18%	$\boxed{16\%}$	$\boxed{38\%}$

N = 713 for "Have Refinanced" (54%); N = 516 for "Never Tried" (39%); N = 93 for "Tried but Unsuccessful" (7%)

Underlined percentages are statistically different than the percentage of the "Have Refinanced" group (α = 0.05 level). Boxed percentages differ significantly between the "Never Tried" and the "Tried but Unsuccessful" groups (at 95% confidence level).

+All data on this slide is self-reported, with exception of Mortgage Rate which is appended to the survey responses by matching Freddie Mac's Primary Mortgage Market Survey® (PMMS®) 30-year fixed mortgage rate to the most recent year respondents reported purchasing or refinancing the most recent mortgage on their home.
†"Tried but Unsuccessful" are individuals who indicated that they have not refinanced the mortgage on their home since purchase, but have tried to refinance in the past 2-3 years.

"Tried but Unsuccessful" consumers exhibit higher financial anxiety and are more pessimistic about their future finances than "Never Tried"

		Have Refinanced	Never Tried	Tried but Unsuccessful[†]
Higher Anxiety	Stress about ability to make all debt payments	28%	25%	37%
	Home mortgage cited as the primary source of stress for making payments	**<u>38%</u>**	38%	**<u>68%</u>**
	Concern about job loss	**<u>19%</u>**	**<u>14%</u>**	21%
Lack of Income and Savings	Do not have sufficient savings	52%	50%	**<u>66%</u>**
	Do not have sufficient income to cover debt and mortgage	**<u>20%</u>**	18%	**<u>29%</u>**
	Would be difficult to get a home mortgage today	**<u>40%</u>**	44%	**<u>63%</u>**
Bleaker Financial Future	Financial situation gotten better over the past year	26%	28%	22%
	Household income significantly lower	**<u>18%</u>**	**<u>11%</u>**	23%
	Believe economy is on the right track	**<u>40%</u>**	42%	**<u>28%</u>**
	Expect financial situation to become worse	24%	**<u>13%</u>**	28%

N = 713 for "Have Refinanced" (54%); N = 516 for "Never Tried" (39%); N = 93 for "Tried but Unsuccessful" (7%)

[†] "Tried but Unsuccessful" are individuals who indicated that they have not refinanced the mortgage on their home since purchase, but have tried to refinance in the past 2-3 years.

Underlined percentages are statistically different than the percentage of the "Have Refinanced" group (α = 0.05 level). Boxed percentages differ significantly between the "Never Tried" and the "Tried but Unsuccessful" groups (at 95% confidence level).

"Tried but Unsuccessful" consumers are more likely to cite qualification, lenders' unwillingness, and the need to put down more money to make up lost home value as major refinancing barriers than "Never Tried"

- Overall, not enough savings, closing costs, and rigid loan terms are the most common barriers

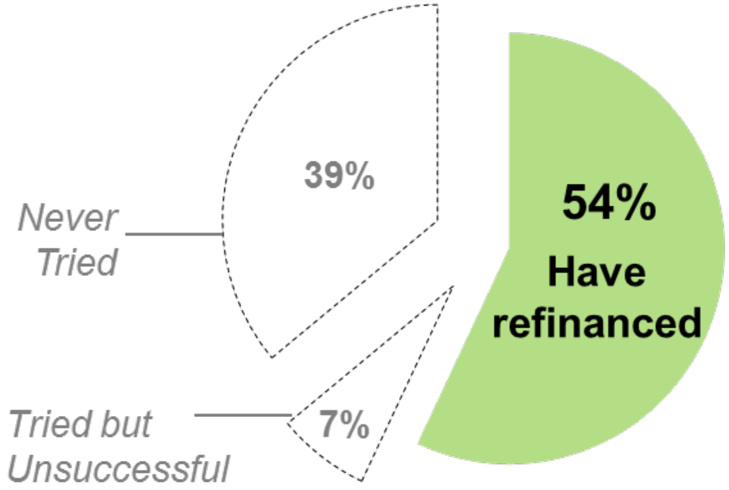
Refinancing Barriers	**Total Not Refinanced**	**Not Refinanced**	
		Never Tried	**Tried but Unsuccessful**
Wouldn't be able to reduce payments	52%	52%	51%
Closing costs are too high	45%	43%	51%
Don't want to lengthen loan term	43%	44%	39%
Not sure what to trust with lenders	32%	31%	40%
Too complicated	31%	31%	32%
Would need to put money down	29%	<u>**26%**</u>	<u>**43%**</u>
Do not qualify for a refinance	22%	<u>**18%**</u>	<u>**46%**</u>
Lenders contacted would not refinance	20%	<u>**15%***</u>	<u>**49%**</u>

N = 516 for "Never Tried" (39% of the whole sample); N = 93 for "Tried but Unsuccessful" (7% of the whole sample)

"Tried but Unsuccessful" are individuals who indicated that they have not refinanced the mortgage on their current home, but have tried to refinance in the past 2-3 years. Each barrier is asked on a 4-point scale, "greatly applies (4)," "somewhat applies (3)," "does not apply very much (2)," and "does not apply at all (1)." The percentages here are top two box scores. Underlined percentages are statistically different between the two groups (at 95% confidence level).

* The questions of "have ever refinanced" and "have tried to refinance" are separate questions in the survey. The 15% here could be due to respondents' misinterpretation of the survey questions or misreporting. Or, respondents might have wanted to refinance, but did not follow through formal procedures.

Past Refinancing Model



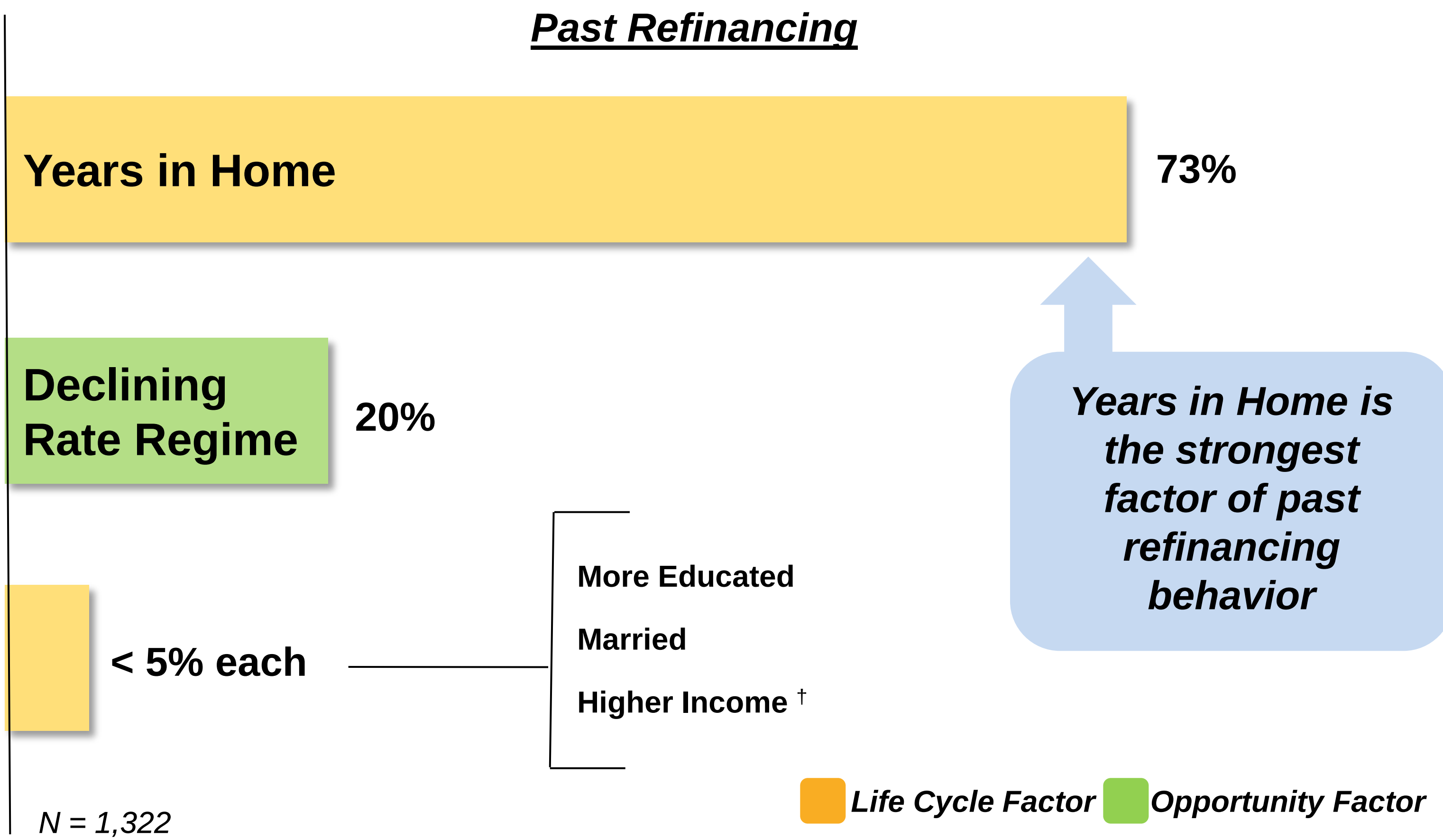
Why did they refinance?

Summary of Past Refinancing Model

- **The number of years in home** is the dominant factor associated with borrowers' behavior of having ever refinanced
  - Further analysis shows that there is a "dormant" period (from 0 to 6 years) when borrowers are not very likely to refinance. The majority of homeowners surveyed refinanced after owning their homes for 6-15 years.
- Mortgage holders who obtained mortgages during periods of declining mortgage rates are more likely to refinance **sooner**.
- Additional factors include education and marriage.

Risk-Mitigation factors are excluded from the Past Refinancing model since those factors reflect *current* attitudes and finances that existed AFTER the refinancing behavior occurred. For details, please see Appendix.

"Years in the home" is the primary factor associated with past refinancing behavior, although "declining mortgage rates" have impact as well



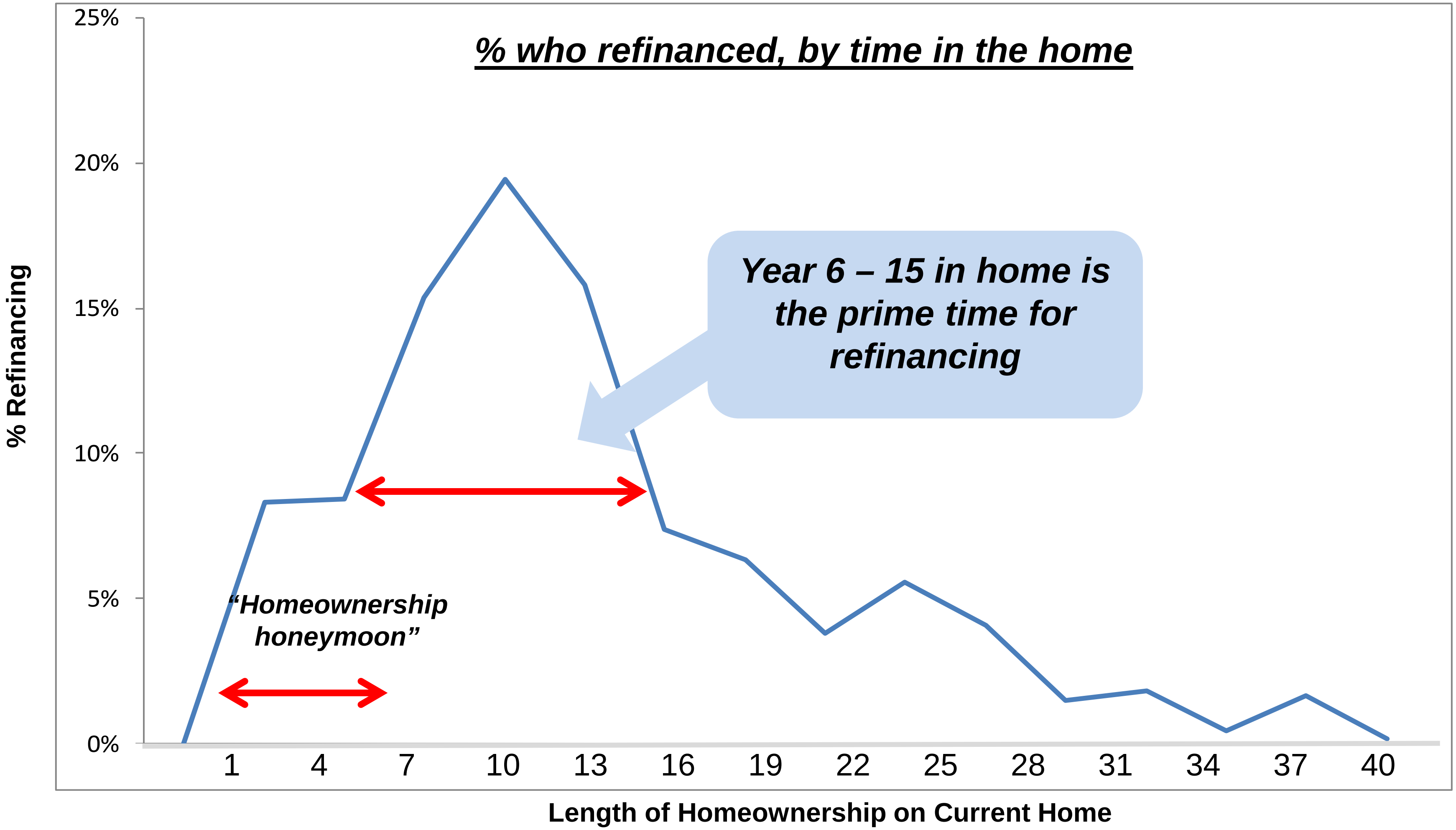
"Percentage of Importance" is calculated by standardizing all coefficients and calculating the percent explanatory power for each standardized coefficient. For more information, please see Appendix. Model Pseudo $R^2 = 0.3$.

Risk-Mitigation factors were excluded from the Past Refinancing model since these factors reflect *current* attitudes and finances that existed AFTER the refinancing behavior occurred. For details, please see Appendix.

† indicates that driver is not statistically significant at the 95% confidence level in the model, but is included in the model as it has significant bivariate association with the outcome variables (through F-tests).

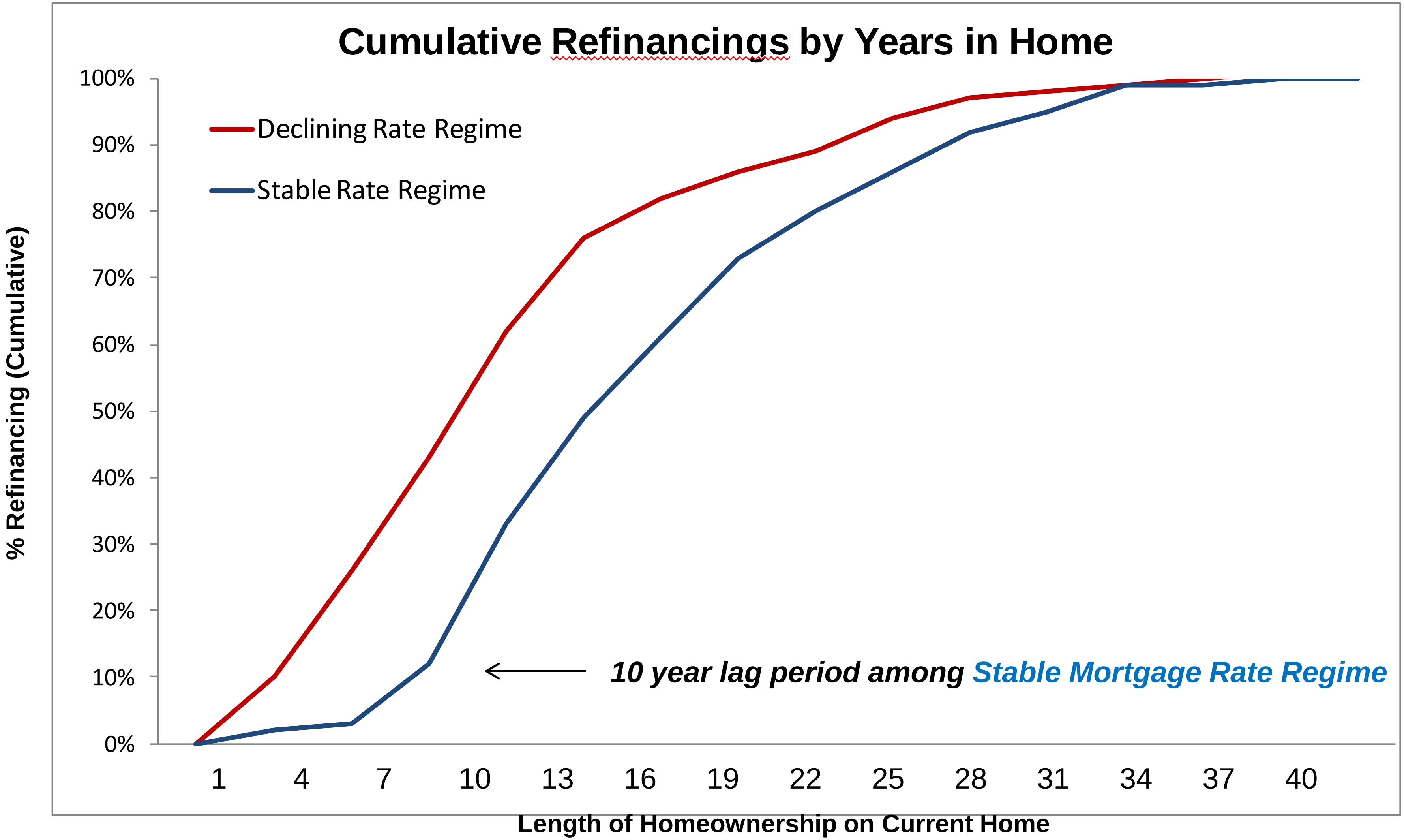
The majority of homeowners refinanced after owning their homes between 6-15 years

- There is a "honeymoon" or "dormant" period (from 0 to 6 years) where borrowers are less likely to refinance.



Base population is refinancers (n=714). % refinancing indicates those who refinanced in the specific year of homeownership.

Those who obtained mortgages during periods of declining mortgage rates refinanced sooner



Base population is refinancers (n=714). % refinancing indicates those who refinanced in the specific year of homeownership.
Declining Rate Regime n = 628. Stable Rate Regime n = 329,

Refinancing Intent Model

Among those who obtained their most recent mortgages (purchase or refinance) more than 3 years ago

Summary of Refinancing Intent Model

- Borrowers who want to refinance in the next 12 months tend to think differently from borrowers who have not refinanced.

- In particular, such borrowers want to **mitigate their risk.** Specifically, they are more worried about their financial situation and want to refinance to get their personal finances in control. Many also have "tried to refinance but were unsuccessful."

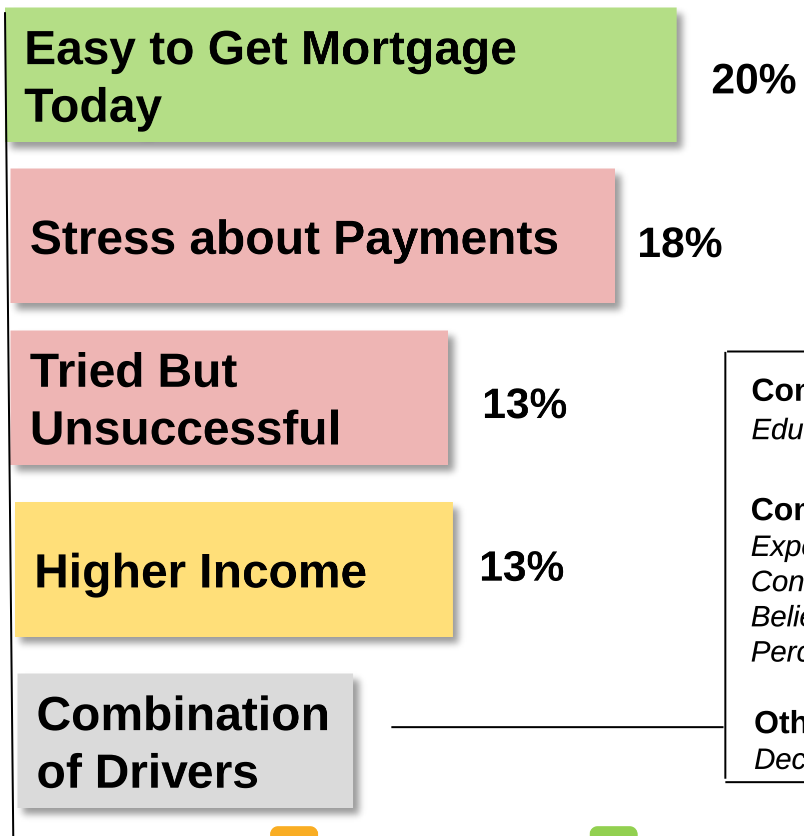
- Borrowers' perceived **opportunities** also drive their future refinancing likelihood. Borrowers who are more likely to perceive that it is easy for them to get a mortgage today are more motivated to refinance in the future.

- Life cycle status such as income also drives consumers' refinancing intent.

The Refinancing Intent model presented here excludes respondents who obtained their most recent mortgage on their home (purchase or refinance) in the past three years. Given the past three years' historic low rates, this population is less likely to refinance in the future. The Refinancing Intent model built based on the entire mortgage-holders population yields similar results, but is a less robust model in terms of model performance (Pseudo R^2). Please see Appendix for details.

Likelihood of refinancing in the next 12 months is driven more by households' desire to mitigate risk

Drivers of Refinancing Intent



Combination of other Life Cycle drivers (15%)
Education †, Race †, Children under 18 †, Married †, Age †

Combination of other Risk Mitigation drivers (19%)
Expect financial situations to get better
Concern about job loss †
Belief that homeownership is a risky investment †
Perceived underwater status †

Other Opportunity drivers (2%)
Declining mortgage rate regime †

N = 785

Life Cycle Driver ***Opportunity Driver*** ***Risk Mitigation Driver*** ***Combination of Drivers***

"Percentage of Importance" is calculated by standardizing all coefficients and calculating the percent explanatory power for each standardized coefficient. For more information, please see the Appendix. Model Pseudo $R^2 = 0.1$. † indicates that driver is not statistically significant at 95% confidence level, but is included in the model as it has significant bivariate association with the outcome variables (through F-tests)..

The Refinancing Intent model presented excludes respondents who obtained their most recent mortgage on their home (purchase or refinance) in the past three years. Given the past three years' historic low rates, this population is unlikely to refinance in the future. The Refinancing Intent model based on the entire mortgage holders population yields similar results, but is a less robust model in terms of model performance (Pseudo R^2). See Appendix for details.

APPENDIX

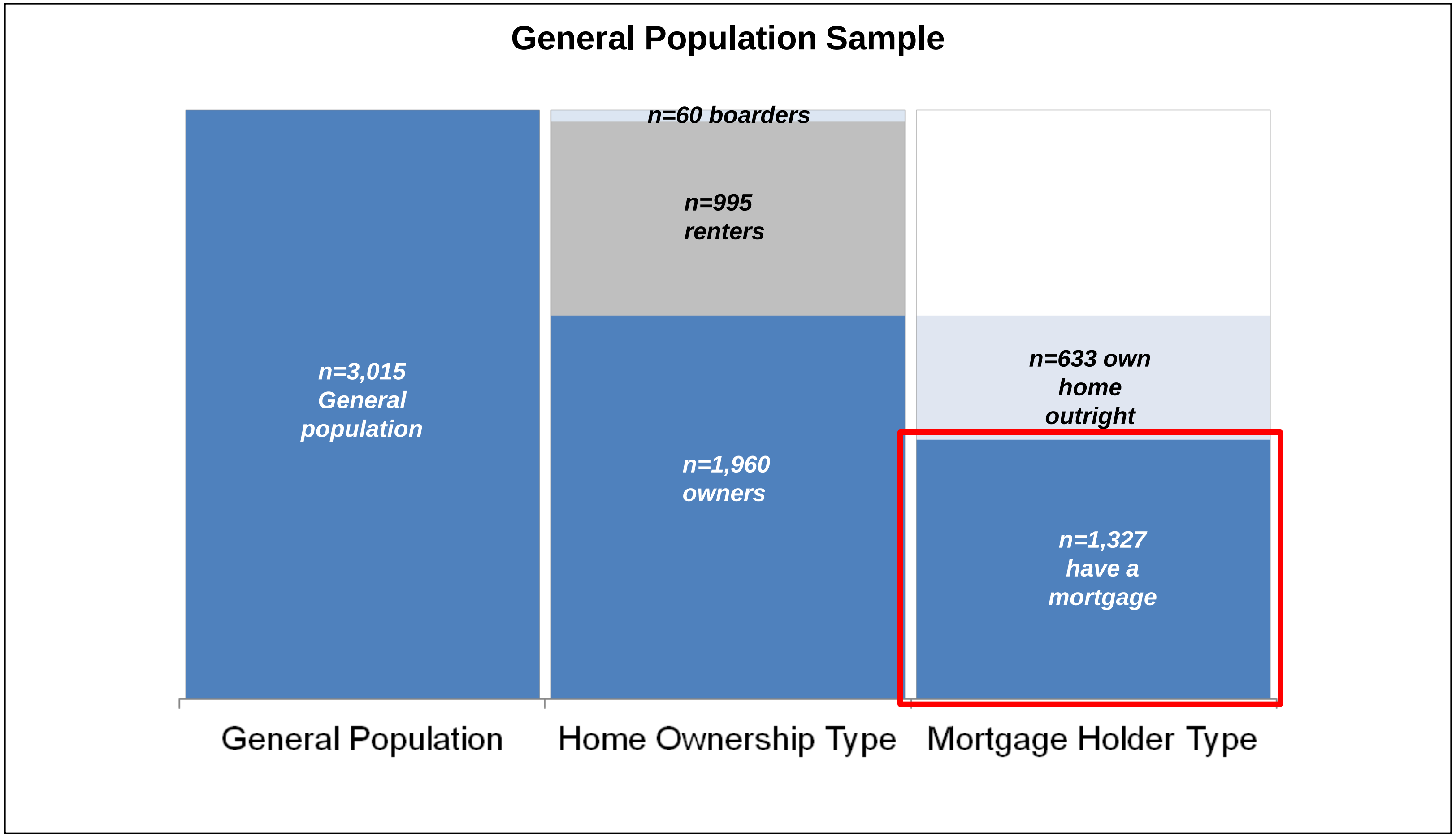
(1) Sample

(2) Methodology and Model Results

(3) LCA Analysis

Sample

Sample of Q1 2013 NHS



- *Note that on each question, respondents had the option to answer "don't know" (volunteered), which is why, in some cases, the total % may not equal 100.*
- *General population interviews were conducted by dialing both landline (75%) and cell-phone only households (25%) to ensure proper representation of cell-phone only households.*
- *The data presented in this study has been weighted to make it reflective of the American Community Survey demographic statistics in terms of gender, age, race/ethnicity, income, education, and housing tenure.*

Methodology and Model Results

Methodology – Variable Selection

- A comprehensive list of variables were considered in the modeling process to analyze the past refinancing behavior and the future refinancing likelihood. The full list of initial variables is presented on the next page.
- Some judgment call was used to exclude certain variables. For example:
  - For the Past Refinancing model, the **“ever refinanced” outcome** is an ***historical*** measure. Individuals who responded having “ever refinanced” may have done so 2 years ago, or 20 years ago. For this reason, Risk Mitigation factors defined in this study cannot be used meaningfully, since the Risk Mitigation variables pertain to the current housing outlook, and respondents’ ***current*** financial situation, perceived underwater status, and so forth.
  - Likewise, the variables of “expect mortgage rates to go up” and “believe that it is easy for them to get a mortgage today” are not appropriate for modeling since they pertain to a current outlook that may or may not coincide with conditions at the time at which the respondent last refinanced.

Methodology – Full List of Initial Variables

VARIABLES
Age
Non White Race
Female
Marital Status
Any Children Under Age 18 in Home
Income
Education Level
Expect financial situation to get better/worse
Personal financial situation has gotten better/worse
Difficult/easy to get a home mortgage today
Type of debt currently have - credit card debt
Type of debt currently have - car loans
Type of debt currently have - school loans
Type of debt currently have - back taxes
Type of debt currently have - other loans/debt
Stressed about ability to make payments
Sufficient savings
Sufficient household income
Concern about losing job in next 12 mos. (4 = Very, 1=Not)
Current household income - higher or lower (3=Higher, 1=Lower)
Current household expenses - higher or lower (3 = Higher, 1=Lower)
Total household debt - higher or lower (3=Higher, 1 = Lower)

VARIABLES
First home?
Length of Homeownership
Bought or Refinanced during easy financial regime
Bought or Refinanced during hard financial regime
Estimated debt to mortgage ratio (5 = best, 1 = worse)
Terms of mortgage changed
Estimated value to price ratio (5 = best, 1 = worst)
Total debt on home - higher or lower (3 = Higher, 1 = Lower)
Economy on right track / wrong track
Good time to purchase a home
Good time to sell a home
Expect home prices to go up/down (3 = up, 1 = down)
Expect US mortgage rates to go up/down (3 = up, 1 = down)
Being better off financially overall
Having the best investment plan

VARIABLES
Having the best overall tax situation
Building up wealth
Saving for retirement
Living within your budget
Making best decision given current economic climate
Financial benefits vs. lifestyle are best reason to buy (1 = Fin, 0 = Lifestyle)
Protection against home decline vs. against rent increase
Buying a home -- risky investment (from Q75)
Buying a home -- investment with a lot of potential (from Q75)
Living in a convenient location
Having a good place for your family to live or to raise your children
Feeling engaged in your community
Living in a place where you and your family feel safe
Having control over what you do with your living space
Having a sense of privacy and security
Having flexibility in future decisions
Living in a nicer home
Living in your preferred school district
Having less stress

Methodology – Logistic Regression

- Two logistic regressions were conducted.
  - “Ever Refinanced”: “have ever refinanced their current home” = 1 and “have not refinanced” = 0.
  - “Likelihood to refinance in the next 12 months”: “very likely” = 1 and the other three choice responses (“somewhat likely,” “not very likely,” and “not at all likely”) = 0.

- An exploratory set of regressions were run, using a set of over 50 candidate variables and with both forward and backward variable selection methods. The results of the forward and backward variable selection methods were consistently found to be highly similar. This variable selection procedure was used to obtain a sense of relationships in the data and to guide the development of more refined research hypotheses.

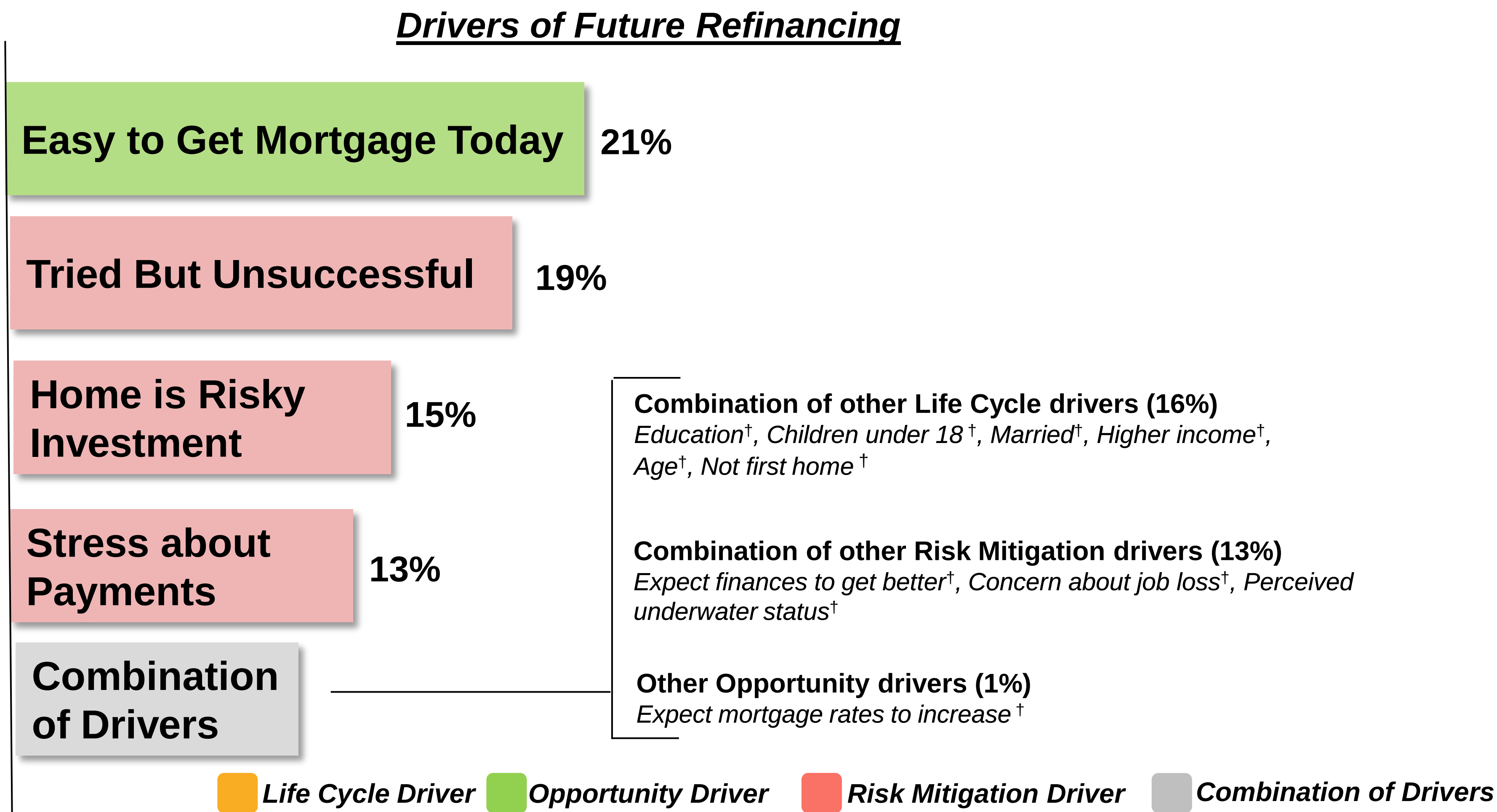
- Following these exploratory analyses, a final set of variables was chosen. We then re-ran the models with the final set of variables, which are presented in this analysis.

Methodology – Sample Selection for the Future Refinancing Model

- For the Refinancing Intent model, the model presented in the main section was built based on the sample, which excludes respondents who obtained their most recent mortgage (purchase or refinance) over the past 3 years, a time period when mortgage rates had been near historical lows. Analysis indicates (see the table below) that respondents who got their most recent mortgage over the past three years less often reported being likely to refinance their mortgage in the next 12 months (likelihood ratio $X^2 = 16.33$, $df = 3$, $p < .01$).
- The Refinancing Intent model based on the entire sample of mortgage holders (without the 3-year exclusion) is presented on the next page. It yields similar results, but the model is less robust (see p. 41 for details) in terms of Pseudo R^2.

		How likely to refinance mortgage on home in next 12 months				
		Very Unlikely	Somewhat Unlikely	Somewhat Likely	Very Likely	Total
Refinanced or Purchased in Last 3 Years (2011-2013)	Count	361	91	40	33	525
	% who refi or purchase during last 3 years	68.8%	17.3%	7.6%	6.3%	100.0%
Did Not Refinance or Purchase in Last 3 Years (2011-2013)	Count	514	99	94	77	784
	% who did not refi or purchase during last 3 years	65.6%	12.6%	12.0%	9.8%	100.0%
	Column Total	875	190	134	110	1309
	% of Grand Total	66.8%	14.5%	10.2%	8.4%	100.0%

Alternate Model of Future Refinancing (among all mortgage holders)



N = 894

"Percentage of Importance" is calculated by standardizing all coefficients and calculating the percent explanatory power for each standardized coefficient. Model Pseudo $R^2 = 0.05$.

† Indicates that driver is not statistically significant at 95% confidence level, but is included in the model as it has significant bivariate association with the outcome variables (through F-tests).

Methodology – "% of Importance" Calculation

- **Standardized logistic regression coefficients** were obtained by multiplying the unstandardized coefficients by the univariate standard deviations of the associated driver (for the relevant sample), and dividing by the standard deviation of the outcome measure.

- **Driver/Factor importance,** which represents an approximate "percent explanatory contribution of each factor in the model to the outcome" is calculated as the square of the driver's standardized logistic regression coefficient divided by the sum of all of the drivers' square of standardized logistic regression coefficients. A variable's regression model coefficient, *b*, is a partial correlation, which is used to generate the model's R^2, a measure of proportion of variance explained. Thus, each variable's squared coefficient is used to indicate its contribution to the model R^2, and hence its contribution to the total explanatory power of the model (i.e., its "importance").* For a given model, therefore, the sum of the importances is 100.

- Formally, if β^*_p is the standardized coefficient for driver *p*, and there are *J* total drivers included in the logistic regression model, the importance for variable *p*, which we denote I_p can be calculated as:

$$I_p = \frac{\left(\beta^*{}_p\right)^2}{\sum_{j=1}^{J}\left(\beta^*{}_j\right)^2}$$

* Schroeder, Larry D., David L. Sjoquist, and Paula E. Stephan. *Understanding Regression Analysis: An Introductory Guide*. Beverly Hills: Sage Publications, 1986. Print.

Logistic Regression Model Results

	EVER REFINANCED		NEXT 12 MOS *		NEXT 12 MOS (FULL SAMPLE)	
	Unstandardized Beta	IMPORTANCE	Unstandardized Beta	IMPORTANCE	Unstandardized Beta	IMPORTANCE
LIFE CYCLE						
Non White	-0.28	0.00	-0.39	0.02	0.00	0.00
Education Level	0.26 ***	0.03	0.20	0.04	0.17	0.04
Have Children Under Age 18	0.15	0.00	0.29	0.01	0.44	0.05
Married	0.52 *	0.01	0.37	0.01	0.35	0.02
Income	0.09 +	0.01	0.23 *	0.13	0.05	0.01
Age	0.00	0.00	0.13	0.06	0.06	0.02
Age of Mortgage	0.20 ***	0.73	0.00	0.00	0.00	0.00
Not First Home	0.24	0.00	-0.09	0.00	0.31	0.02
OPPORTUNITY						
Rate Cohort: Declining	1.77 ***	0.20	0.35	0.02	-0.13	0.00
Rate Cohort: Stable	---	---	---	---	---	---
Rate Cohort: Rising	-3.25 **	0.02	---	---	---	---
How Easy Get Mortgage Today	---	---	0.54 **	0.20	0.43 **	0.21
Expect Mortgage Rates Go Up (Cont.)	---	---	-0.03	0.00	0.19	0.01
RISK MITIGATION						
Expect Financial Situation Get Better 12 Mos	---	---	0.36 *	0.09	0.21	0.05
Stressed About Ability Make Payments	---	---	0.53 **	0.18	0.35 *	0.13
Concern About Losing Job Next 12	---	---	0.32 +	0.06	0.19	0.03
Perceived Underwater Status	---	---	-0.08	0.01	-0.16	0.05
Home is Risky Investment	---	---	-0.45	0.02	-0.89 *	0.15
Tried but Unsuccessful	---	---	1.45 **	0.13	1.35 **	0.19
PSEUDO R^2 (COX & SNELL)	0.303		0.082		0.049	

Significance levels: *** = p < .001; ** = p < .01; * = p < .05; + = p < .10.
Data weighted.

* Among those who obtained their most recent mortgage (purchase or refinance) more than 3 years ago.

Variable Coding

DRIVER	QUESTION NUMBER	QUESTION TEXT	VARIABLE CODING
Respondent Age	Q122	Which of the following categories best describes your age?	1= 18 - 20; 13 = 75+
Years in Home	Q26a	How long have you owned your current home?	Lowest Value = 1 Year; Highest Value = 41 Years
Current Home is Not First Home	Q25	Is this the first home you've owned?	1 = No; 0 = Yes
Believe is Easy to Get Mortgage Today	Q22	Do you think it would be very difficult, somewhat difficult, somewhat easy, or very easy for you to get a home mortgage today?	1 = No; 0 = Yes
Expect Interest Rates to Go Up	Q20	During the next 12 months, do you think home mortgage interest rates will go up, go down, or stay the same as where they are now?	1 = Rates will go down; 3 = Rates will go up
Expect Financial Situation to Get Better in 12 Months	Q11	Looking ahead one year, do you expect your personal financial situation to get much better, somewhat better, stay about the same, get somewhat worse, or get much worse?	1 = Much worse; 5 = Much better
Stressed About Ability to Make Debt Payments	Q109	Are you very stressed, somewhat stressed, not very stressed or not at all stressed about your ability to make payments on your debts?	1 = Not at all stressed; 4 = Very stressed
Concern About Losing Job Next 12 Months	Q112b	How concerned are you that you will lose your job in the next twelve months? Are you very concerned, somewhat concerned, not very concerned, or not at all concerned that you will lose your job in the next twelve months?	1 = Not at all concerned; 4 = Very concerned
Perceived Underwater Status	Q91	Thinking about the total amount you owe on your home (including first mortgage, second mortgage, and home equity line of credit debt) compared to the value of your home today, would you say the total amount you owe on your home is…	1 = At least 20% less than value; 5 = At least 20% more than value.
Believe Homeownership is a Risky Investment	Q75	Now I am going to read a list of some actions and for each one I'd like you to tell me if you think it is a safe investment with a lot of potential, a safe investment with very little potential, a risky investment with very little potential, or a risky investment with a lot of potential. "Buying a home"	1 = Believe home is a risky investment; 0 = otherwise.
Tried to Refinance	Q71aj	Have you tried to refinance your mortgage in the past 2-3 years (Asked of those who have not refinanced)?	1=Yes, 2=No

LCA (Latent Class Analysis)

Latent Class Analysis (LCA) of Refinancing Barriers

- A Latent class analysis (LCA), similar to a factor analysis, was conducted to examine if there were patterns in responses to the "reasons for not refinancing."

- These not-refinancing reasons/items are original on a 1-4 scale, with 1 being "Greatly applies" and 4 being "Does not apply at all."

- For the Latent Class Analysis, we dichotomized these items by coding them as "top 2 response categories" ("greatly applies" and "somewhat applies") vs. "all other response categories" ("does not apply very much" "does not apply at all" and "don't know").

Barriers to Refinancing
Do Not qualify for a refinance
Closing costs are too high
Don't want to lengthen loan term
Have to put money down to make up for the value lost
Process is too complicated
Not sure who to trust with lending institutions
Lenders contacted would Not refinance my mortgage
Would Not reduce payment enough to make it worthwhile

- Latent class does not deterministically assign respondents to a single latent class (as agglomerative cluster analysis does), but generates the probability of each respondent belonging to each class. Conditional probabilities of approximately .50 indicate that a respondent is as likely as not to endorse the item (i.e., is ambivalent); conditional probabilities of 1.0 indicate perfect conditional agreement, conditional probabilities of 0.0 indicates perfect conditional disagreement.

About 40% of respondents have low probability of endorsing any of the key refinancing barriers asked in the survey

- Our analysis does not cover all the reasons of why people do not refinance. Further research is needed to provide deeper insights.

Reason for Not Refinancing	Class: Qualification Issues (6.9%)	Class: Multiple Reasons (8.3%)	Class: Uncertain (41.4%)	Class: Cost Conscious / Pragmatic (42.9%)
Do Not Qualify	+	+/-		
Closing Costs Too High	+/-	+		+
Don't Want to Lengthen Term		+		+/-
Have to Put Money Down to Make up for the Home Value Lost	+/-	+		
Process Too Complicated		+		+/-
Not Sure Which Lenders to Trust	+/-	+		+/-
Lenders Contacted Would Not Refinance Me	+	+		
Would Not Reduce Payment Enough		+		+/-

+ = *Members of class tended to endorse item in affirmative (>= .65)*
+/- = *Members of class tended to be ambivalent about item (< .65)*