Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S. Supplemental Report

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Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S.

Supplemental Report

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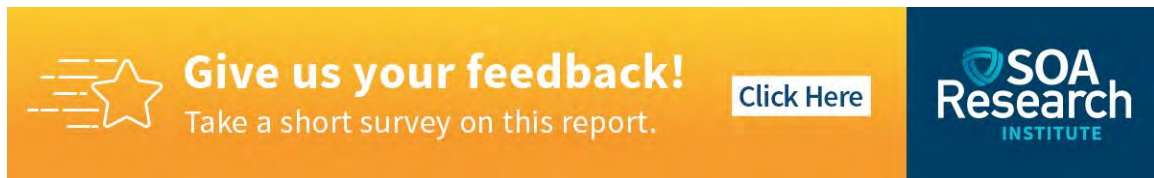   Irmeya Ouedraogo, ASA, MAAA

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This report is supplemental to the Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S.: Main Report, available at https://www.soa.org/resources/research-reports/2023/corr-ins-ret-wealth-inequality-us/ .

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Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S.

Supplemental Report

Section 1: Introduction

This is a supplemental report to our report *Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S.: Main Report*,[1] which discusses our research and findings on the correlation between insurance and retirement products ownership (specifically homeowners and renters insurance, life insurance and retirement products) and income and wealth inequality across various racial and ethnic groups in the United States.

Our main report provides an overview of our statistical research. We obtained data on insurance and retirement products penetration rates by geographical area (specifically, 2019 U.S. Census block group, or CBG, data). We connected that data to the 2019 U.S. Census demographic data at a CBG level. With this dataset, we used a multiple linear regression approach to study the relationship between race or ethnicity and insurance and retirement product penetration.

In this supplement, we provide more in-depth discussion of our statistical analysis including our approach to selecting our data and methodology along with advantages and limitations (Section 2) as well as detailed information on our data (Appendix A) and regression results (Appendix B). Lastly, in Appendices C and D we provide a summary of our literature review as well as suggested reading for those interested in learning more about the history of legal and societal practices that have contributed to the observed income and wealth gap between races or ethnicities in the U.S.

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[1] Steve Bochanski et al, May 2023, *Correlation of Insurance and Retirement Product Penetration with Wealth Inequality in the U.S.*, Society of Actuaries, https://www.soa.org/resources/research-reports/2023/corr-ins-ret-wealth-inequality-us/.

Section 2: Statistical Analysis Approach

We conducted a statistical analysis to answer two of our research questions:

- Does the ownership of insurance (including retirement saving) products vary significantly by race or ethnicity in the U.S.? How significant is this?
- Can we infer reasons why these variations in prevalence exist?

Our statistical analysis is explanatory in nature as opposed to predictive. As a result, our analysis focuses on the strength of relationships. To measure explanatory strength, our research focuses on R2-type values and statistical significance of overall F-type statistics. This is in contrast to predictive models, which aim to maximize predictive accuracy on new data and focus on measures of predictive power such as out-of-sample metrics and in-sample approximations.

To study differences in ownership rates of homeowners insurance, renters insurance, life insurance and retirement products by race or ethnicity, ideally, we would have recent data on a sample of individuals who are representative of the U.S. population that contained product ownership and demographic information, including race or ethnicity. This would allow us to directly study penetration (ownership) rates by race or ethnicity. It would also allow us to draw conclusions from our model at an individual level (i.e., how likely an individual is to have insurance based on demographic characteristics). However, such data is unavailable. As a result, we have found alternative sources from which we can draw inferences.

In this section, we describe our approach to selecting our data and methodology for our statistical analysis along with advantages and limitations.

2.1 DATA AND DATA SOURCES

In selecting the data to include in our models, we considered various data sources for insurance and retirement product penetration, race or ethnicity, geography, and other demographic information. We considered the advantages and disadvantages of each data source in the context of our research questions and selected a preliminary set of data variables based on relevance to our research, our literature review and availability of reliable data as described below.

2.1.1 EVALUATION DATE

Our proprietary database contains data from 2019 and after. All else equal, we would have conducted our research using the most recent data available. However, we are not researching the impacts of the COVID-19 pandemic, which started in the U.S. in 2020. As a result, we concluded that data from 2020 and 2021 may not complement our purpose given that one of our research goals is to serve as a baseline analysis for insurance and retirement product penetration by racial or ethnic group. As a result, we have conducted our statistical research on 2019 data only.

2.1.2 DATA SOURCES

Certain demographic variables were available from more than one data source. In deciding which sources to include in the regressions and the regression model design, we considered:

1. **Granularity and number of observations:** Our data sources had varying data grains. All else equal, we prefer more granular data for running the regression model with the goal of being able to model individual-like behavior. Similarly, we prefer a higher number of observations to achieve more reliable estimates. In our

statistical analysis, certain data was available at various granularities (Table 1, from most to least granular, with number of rows, observations or records shown):

Table 1
NUMBER OF RECORDS BY GRANULARITY

Granularity	Number of Records (approximate)
Individual	230,000,000
Household	120,000,000
ZIP-9	45,000,000
U.S. Census Block	220,000
U.S. Census Tract	71,000
ZIP-5	43,000
Segment	60

Our data with the fine detail comes from proprietary data sets developed for marketing purposes, which is at an individual or household level for nearly the entire U.S. adult population.

2. **Methodology:** We considered the methodology used in developing the dataset. While the marketing data is advantageous based on granularity and number of observations, actual data is unavailable for every individual for each variable. As such, the vendor uses modeling algorithms to determine imputed values. The techniques used in the marketing data are proprietary to the vendor and, therefore, not available for scrutiny by the research team. In addition, biases may exist in the marketing data, such as a stronger focus on the population with greater purchasing power.

The 2019 American Community Survey (2019 ACS), accessible via a publicly available application programming interface (API), also includes estimated data. Specifically, the ACS demographic estimates use interim, smaller sample surveys and design-based or model-based estimation techniques to project 2019 data from the 2010 U.S. Census. However, the U.S. Census employs industry recognized survey and extrapolation practices designed to represent the entire U.S. population.

Based on these considerations, we selected data from three primary sources:

A. **Demographics:** When available, we selected data variables from the 2019 ACS because of its well-established methodology and scope. Specifically, we relied on the 2019 ACS one-year estimates.

However, several demographic variables of interest were not available in our data, including multi-generational household, first generation American, parents' educational attainment, personal mobility and access to insurance.

B. **Insurance and retirement product penetration rate:** Insurance and retirement product penetration rate data is not available in the 2019 ACS; by this we mean, the 2019 ACS does not contain data on what percent of the population in a given CBG owns homeowners or renters insurance, life insurance or retirement products. As a result, we have collected data from a proprietary marketing dataset, which is extrapolated from a nationally representative survey of household interviews conducted between Q2 2018 through Q1 2020. This dataset provides penetration data at a proprietary segment level, which divides the population based on age, wealth, home ownership and technology use. The vendor assigns each U.S. household in the dataset a proprietary segment based on business rules or a modeling algorithm, that

allows us to aggregate the insurance and retirement product penetration data to any geographic level. At an individual or household level, we interpret the penetration rates as a probability of owning the specific product.

C. **Median household net worth:** Median household net worth is not available from the 2019 ACS. As a result, we used proprietary 2019 net worth data, which is available at a household level and developed for marketing purposes from multiple sources, such as forms completed for subscription services and credit reports. As information on each household varies in its completeness, the vendor provided imputed values using business rules and modeling algorithms for fields where data was not otherwise available.

Our regressions are run at a CBG level for two reasons. First, for most of our demographic data from the ACS, the lowest level of granularity available is at a CBG level. Second, aggregating modeled variables (such as net worth) from a household level to a CBG level reduces modeling or imputation error to an acceptable level for our study. The final list of variables used and their source and original granularities are shown in Appendix A Table A1. In addition, we considered other demographic variables that ultimately were dropped from our model or not found in the available data sets. These variables are summarized in Appendix A, Table A2.

2.2 OVERVIEW OF METHODOLOGY AND APPROACH

Once we identified the key data sources, we reviewed the data to identify issues of completeness, collinearity and correlation with other variables and selected the final data to include in our statistical analysis. Using the selected data, we designed a regression model to align with our key research questions.

2.2.1 PRELIMINARY DATA ANALYSIS

Prior to designing the regression approach and running the regressions, we performed preliminary data analysis, which included pre-processing and exploratory data analysis (EDA).

Pre-processing. We pre-processed the data via the following steps:

1. **Scoping the analysis:** We identified a set of available independent and dependent variables from various data sources at different levels of granularity that could be used to study the relationship between disparities in insurance and retirement product penetration across several key demographic groups.
2. **Identifying data gaps:** We reviewed the preliminary list of available variables to identify data needed for the statistical analysis that was unavailable in the original data set. We did not identify gaps that required supplemental data.

3. **Creating a data fabric:** Since the proprietary data set contains data from different sources and at different granularities, we created a master data model by stitching the data sources together. At this preliminary step, we first rolled up all the non-U.S. Census variables that exist at an individual or household level (net worth and likelihood to own homeowners or renters insurance, life insurance and retirement products) to a CBG average. Next, all data was stitched together at the CBG level. For variables at a higher level of granularity (census tract or ZIP-5), each CBG was assigned the characteristic of the larger geographic unit to which they belong.

Exploratory Data Analysis (EDA): To better understand the extracted data, we conducted an exploratory data analysis. It involved:

1. **Summarizing the extracted data:** We summarized the distribution of each variable by the possible values and calculated weighted averages, where appropriate, to validate the data against externally published sources.

2. **Cleaning the extracted data:** This step involved dropping CBGs in which any of the variables had missing values.

3. **Feature engineering:** Based on preliminary analysis, we transformed some of the variables to create features that better capture the underlying problem at hand. For example, it is well-known that income and wealth are both highly-skewed variables. So, we used their log transformation in the regression analysis to remove this skew and improve model fit.

4. **Treating categorical variables:** We then added dummy, binary variables for all the categorical variables – a standard, technical step needed to include categorical variables in a regression.

5. **Running correlation analysis:** We then derived a correlation matrix to provide quantitative information on collinearity among independent variables, among dependent variables and between independent and dependent variables by running a Pearson correlation analysis on all independent and dependent variables. We used this information to inform the selection of the final variables included in the statistical analysis.

6. **Univariate analyses:** Using univariate analysis, we reviewed the data variables for collinearity and correlation to further refine the final variables for inclusion in the statistical analysis. For example, by looking at its minimum and maximum values and quantiles in the univariate analysis of life insurance penetration variables, we confirmed that this variable demonstrates sufficient variation between geographic units. We removed variables identified in the univariate analysis as being highly skewed or not demonstrating meaningful variation as these would not be useful in the regression analysis.

2.2.2 CHOICE OF MODEL: REGRESSION

To study the impact of demographics on Insurance and retirement product penetration, we chose a multiple linear regression approach. However, we could have used other statistical algorithms instead. In selecting our approach, we considered the trade-off between explain ability (interpretation) and predictive power (performance). Some techniques, such as Random Forest, Decision Trees, XGBoost etc., are "black-box" models that involve many hyperparameters that produce results that may not be intuitive and are difficult to explain.

Multiple linear regressions describe and quantify linear relationships, which aligns with the goal of our research. In addition, for large datasets, multiple linear regressions generate similar results to other advanced analytic techniques. Given the size of our dataset, we would not expect significantly different results had we selected a different algorithm. Lastly, one of the limitations of multiple linear regression is multicollinearity within independent variables. Please see Section 2.2.3.4 for a discussion on how we measured and mitigated multicollinearity in our analysis.

2.2.3 PROPOSED REGRESSION ANALYSIS METHODOLOGY

Based on the considerations and preliminary data analysis previously discussed, we ran our regression models at a U.S. CBG level, aggregating household level variables to census block level averages. As previously mentioned, variables available at a lesser degree of granularity (e.g., census tract) were assigned to all census blocks within the

level of granularity available. Segment-level variables were first assigned to all individuals belonging to that segment as propensities before being averaged at a census block level.

First, we ran initial "simple" models (one for each product: homeowners or renters insurance, life insurance and retirement products) using only race or ethnicity as independent variables and the penetration rates of the product as dependent variables (R/E-only models) to assess whether disparities in penetration rates of these products exist by race or ethnicity. Next, because our research questions focus on disparities in homeowners or renters insurance, life insurance and retirement product penetration after controlling for differences in income and wealth, we expanded our regressions to include demographic variables and controlled for the impact of income and wealth. We controlled for the impact of income and wealth levels in two ways. First, in what we refer to as the models "expanded for other demographics by income band" (EFOD-IB), we divided our U.S. CBGs into five bands of median household income (less than or equal to $39,999, $40,000–$52,999, $53,000–$66,999, $70,000–$89,999, and greater than or equal to $90,000), which are roughly equal in population size. We then ran separate regressions for each quintile. This approach allowed us to identify differences that may exist in insurance and retirement product penetration by race or ethnicity controlling for differences in income level. Second, we ran a regression on all CBGs without bucketing into income bands and included a wealth variable (log of net worth) as an additional independent variable (EFNWOD model). We discuss in more detail below the selection of log of net worth as our wealth variable. Features of the final regression analyses included:

1. **Type of Model:** Weighted Least Squares (WLS) regressions were run using each U.S. CBG's population as the weights in each regression.

2. **Model specification:** For the three product groups in our study (homeowners or renters insurance, life insurance and retirement), we ran regressions to understand the relationship between each of the insurance penetration variables of interest and race or ethnicity, controlling for income and wealth across demographic groups.

   The EFNWOD regression model for each insurance or retirement product under study was specified as follows:

$$Y_i = \alpha_i + \sum_{j=1}^{J} \beta_{ji}RaceVariable_{ji} + \sum_{k=1}^{K} \gamma_{ki}WealthVariable_{ki}$$
$$+ \sum_{m=1}^{M} \theta_{mi}DemographicVariable_{mi} + \epsilon_i, -$$
$$i = 1,2,\ldots,N$$

   The "income band" regression model for each insurance or retirement product and income band under study was specified as follows:

$$Y_i = \alpha_i + \sum_{j=1}^{J} \beta_{ji}RaceVariable_{ji} + \sum_{m=1}^{M} \theta_{mi}DemographicVariable_{mi} + \epsilon_i,$$
$$i = 1,2,\ldots,N$$

   where,

   $N (= 199,006)$ is the total number of block groups under study,

w_i is the weight assigned in the case of WLS regression and is the population of the ith block group and

Y_i is the dependent variable, the insurance penetration for life, homeowners or renters or retirement in the block group.

$RaceVariable_j$ is the variable corresponding to the proportion of the jth race in a given CBGi, which includes:

- Native Americans (including Native Alaskans)
- Asian or Asian Americans
- Blacks or African Americans
- Hispanics or Latinos
- Pacific Islanders (including Native Hawaiians)
- Whites
- Multi-ethnic
- Other races

Note: for modeling purposes, to eliminate independence among the variables, the largest race (whites) was used as the base category and not included as a variable within the model. However, to avoid baseline categories being interpreted as "typical" in our research, we present transformed coefficients which have been restated to be in relation to the national average racial or ethnic distribution. Please see Section 2.2.5 for a complete discussion.

$WealthVariable_k$ is the kth core the wealth-related independent variable of interest.

3. **Forward regression:** We determined the set of demographic variables to be used as controls for the EFNWOD models and EFOD-IB models, as well as their respective, relative importance in the model using a forward regression approach that runs the following:

   a. The base regression, which includes only the race variables.

   b. Second, we considered the following wealth variables to include in our EFNWOD model:

      - Log of Net worth: Log of average household net worth in the U.S. CBG.
      - Log of median household income: Log of median household net worth in the U.S. CBG.
      - Income distribution: Proportion of households with income less than $25,000, $25,000–$50,000, $50,000–$100,000, and greater than $100,000 in CBG
      - Log of Median housing value: Log of median value of owner-occupied housing units in the U.S. CBG.
      - Employment status: Proportion of workers aged 16+ employed in the U.S. CBG.

      To select which wealth variable to include in the model, we add each wealth variable to the model individually. In this case, we chose the wealth variable, log of net worth, which led to the largest model fit improvement using the Bayesian Information Criterion (BIC), as indicated by lower BIC values.

   c. Last, one of the remaining demographic variables is chosen to be added to the EFNWOD and EFOD-IB models. Based on our literature review as well as what demographics were available in our data, we considered the following demographics: marital status, educational attainment,

language barrier or limited English-speaking ability, household size, healthcare coverage, access to transportation, internet access, age, sex, urbanicity and foreign born.

Specifically, we first add the variable which leads to the largest model fit improvement using the Bayesian Information Criterion (BIC). Using this criterion, lower BIC values indicate a better model fit. For certain wealth or demographic variables, e.g., education level, multiple covariates (indicating the proportion belonging to each category), were added to the model as a group rather than individual categories. We selected BIC as the criterion because in scenarios where two models have very similar adjusted R2, implying that they are equivalent in explaining the outcome, a simpler model with less variables is often desirable for easier interpretation. BIC penalizes complex models more than simple models, and hence the model with the lowest BIC score was preferred in our study.

This is repeated until the BIC can no longer be improved by the addition of any remaining variable. The variable groups are added into the final regression models in their relative order of importance as determined in this step. See Section 2.2.4 for the list of final variables.

4. **Multicollinearity checks:** Multicollinearity occurs when two or more independent variables are highly correlated with one another. In a regression model, multicollinearity can create uncertainty in attributing the effect of the interrelated variables, or, more specifically, which interrelated variable has an effect on the dependent variable. To address multicollinearity, we removed variables with high Variance Inflation Factors (VIF).

   VIF. While it is difficult, if not impossible, to eliminate multicollinearity completely—especially when using independent variables that are interrelated (e.g., proportion of Hispanics or Latinos and proportion of limited English-speaking households in a zip) —we attempted to minimize the effect of multicollinearity through Variance Inflation Factor (VIF) analysis. VIF is a standard measure used to detect multicollinearity, with values ranging from 1 (not correlated) to infinity (perfect correlation). While considerable debate exists as to the specific threshold to use, a VIF of 5 or larger is generally considered problematic. Based on our VIF analysis, we dropped variables with a high VIF (>5), beginning with the variables which were added in the later steps, until all independent variables had VIF <5. By doing so, we largely eliminated multicollinearity from the model. The independent variables we excluded from the model due to high VIF were variables for the penetration rates of different types of healthcare coverage.

   While a regression model cannot eliminate multicollinearity completely, the use of VIFs largely addresses high multicollinearity in our models, and we would not expect significant distortion in the variance of estimates from remaining collinearity. In addition, our data includes more than 220,000 U.S. CBGs representing the total U.S. population. The use of such a large dataset significantly overcomes concerns of multicollinearity and should produce results similar to more advanced modeling techniques that can be difficult to explain and interpret.

5. **Impact of adding control variables on coefficients and significance:** To further understand the impact of adding control variables to the regression models, especially the effect on the coefficients for race or ethnicity, we ran each final regression model in the three stages shown in Figure A1.

Figure A1
FINAL REGRESSION MODEL STAGES

Race and Ethnicity Variables	Wealth Variables	All Other Demographic Variables Identified in the Exploratory Regression Step
Racial and ethnic groups will be included in all of the income band regressions for all research questions.		Demographic variables will be included in order of statistical significance; any variables found not to contribute meaningfully to the overall regression in terms of fit and significance will be excluded from the final models.

The final regression variables selected are shown in the next section.

2.2.4 FINAL REGRESSION VARIABLES

As discussed, we use the forward regression to determine the set of wealth and demographic variables to include in the regression. The set of variables selected for each category is shown below.

1. Wealth variables ("EFNWOD model" only)
   a. Log of Net worth: Log of average household net worth in the U.S. CBG.
2. Additional demographic variables (or sets of variables)
   a. .
   b. Marital Status (4 variables): Proportion of residents aged 15+ in the U.S. CBG currently: never been married, married, divorced, and widowed.
   c. Education (5 variables): Proportion of residents in the U.S. CBG with each of the following educational attainment levels: less than high school, high school, some college, bachelor's degree, and postgraduate or professional degree.
   d. Language Barrier or Limited English-Speaking Status: Proportion of households in the U.S. CBG with limited English-speaking status.
   e. Household status (4 variables): Proportion of households in the U.S. CBG that are nonfamily households or family households with 2, 3 or 4+ members.
   f. Access to transportation: Proportion of households in the U.S. CBG that drive or carpool to work.
   g. Internet Access: Proportion of households in a U.S. CBG with internet access.
   h. Age: Median age of adults in U.S. CBG.
   i. Sex: Proportion of female residents in U.S. CBG.
   j. Urbanicity (3 variables): whether the block group is an urban, suburban or rural development level.
   k. Percentage of population that is foreign born: Proportion of individuals in the U.S. CBG that are born outside of the U.S.

Considerations regarding the interpretation and presentation of our regression results are discussed below.

2.2.5 PRESENTATION OF REGRESSION COEFFICIENTS FOR CATEGORICAL VARIABLES

For categorical variables, such as race, statisticians and data scientists traditionally run regressions by choosing one category, typically the largest category, as the baseline and fitting regression coefficients for each of the remaining categories. Statisticians then interpret the regression results as the average difference in the dependent variable for individuals belonging to a given category relative to the baseline category. While this is a standard statistical approach, comparisons to the baseline category and the lack of a coefficient for the baseline category may be non-intuitive to non-statisticians. In addition, the baseline category might be interpreted as being the "typical" category. This is particularly problematic when studying race or ethnicity in the United States, in which case whites, as the most populous group in the U.S., would be the base category.

To avoid interpretations of a base category as "typical" in presenting our results, we did not show a base category. Instead, we created a national average baseline by employing a weighted sum-to-zero constraint on the coefficients:

$$\sum_{j=1}^{m} p_j \beta_j = 0,$$

where we use p_j to refer to the national prevalence of category j. Practically speaking, we impose this constraint by first obtaining regression coefficients $\gamma_j, j = 1, \ldots, m$ by using some choice of baseline and then calculating $\beta_j = \gamma_j - \sum_{k=1}^{m} p_k \gamma_k$. Such obtained β_j can be verified to satisfy the constraint as

$$\sum_{j=1}^{m} p_j \beta_j = \sum_{j=1}^{m} p_j (\gamma_j - \sum_{k=1}^{m} p_k \gamma_k) = \sum_{j=1}^{m} p_j \gamma_j - \sum_{k=1}^{m} p_k \gamma_k = 0$$

β_j, obtained through this constraint, can be interpreted as the difference between the average of all observations belonging to category j and the national average. Let γ_j be the coefficients obtained using an arbitrary choice of baseline. Notice that if we average across the entire dataset, the average effect due to the categorical variable is exactly $\sum_{k=1}^{m} p_k \gamma_k$. β_j, which is the difference between each of the original coefficients and their average, and hence represents the average difference between an observation belonging to category j and the national average.

The detailed results of this statistical analysis are included below.

2.2.6 INTERPRETING REGRESSION COEFFICIENTS

In presenting our regression coefficients, we include p-values. P-values are a widely accepted measure of statistical significance. Specifically, p-values represent the probability that we would observe the regression coefficient given the null hypothesis is true with the null hypothesis being the coefficient for the regression is 0.

We observe that p-values can be affected by the following:

- Multicollinearity can inflate p-values, which yields unreliable results (i.e., the interpretation of the regression coefficients and their significance becomes unreliable) while minimally affecting the overall model fit.
- Our homeowners or renters insurance, life insurance and retirement product penetration data is at a proprietary segment level. Each household in the U.S. is assigned to one of 60 segments. We have extrapolated the likelihood a household has each insurance or retirement product at a CBG level, by rolling up the data from a household level to CBG level. However, due to the limited unique observations for each product, the statistical impact is that p-values may be artificially lower.

As we interpreted model results, we did not rely on regression coefficients associated with high p-values, i.e., greater than or equal to 0.05. For transparency, we marked coefficients with high p-values in our regression tables with italicized text. We note that very few of the coefficients in our models had high p-values outside of the smaller

categories for race or ethnicity. While we have included the results in these categories, we do not focus on these categories in our interpretations as these categories have unknown heterogeneity.

2.3 LIMITATIONS

Throughout this report, we have discussed limitations underlying our research. In particular, data availability and reliability has constrained our analysis. For example, our data was extrapolated using various techniques, including modeling algorithms. Errors in modeling of the data can translate into margins of error for the coefficients in this report. However, this extrapolation produced a larger more complete dataset, which increased the power of our model. The extrapolation is a standard approach done by the data vendor, using a set of algorithms to arrive at the result. We believe this approach should minimize modeler's bias. Section 2.1 describes the available data sources and our approach in detail along with the associated limitations.

In addition, our data is at a U.S. CBG level rather than an individual level. As a result, our model shows correlations or effects of increasing the proportion of the demographic (variable) in a U.S. CBG rather than the effect a demographic has on likelihood an individual owns a given insurance or retirement product.

With respect to the modeling approach, we used multiple linear regression to enable the study of relationships between multiple variables and produce results that are easy to understand and explain. We acknowledge that other, more advanced statistical approaches could have been used, but with our large dataset, we would expect similar results. A more complete discussion of the advantages, disadvantages and our rationale may be found in Section 2.2.

Lastly, many of our demographic variables have some degree of correlation with one another. In Section 2.2.3, we discuss how we have mitigated the impact of multicollinearity.

Section 3: Acknowledgments

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Appendix A: Data

Tables A.1.A through A.1.H show the description of each variable used in our regression models as well as the source and the level of granularity. Data sources are U.S. Census (A) and two proprietary data sources (B) and (C).

Table A.1.A
STATISTICAL ANALYSIS DEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY

Dependent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Homeowners or Renters insurance penetration	Percent of households in a segment likely to have homeowners or renters insurance. Rolled up and aggregated at CBG level using segment-households distribution in CBG	B	Segment	1,177	99%
Life insurance penetration	Percent of adults in a segment likely to have any type of life insurance. Rolled up and aggregated at CBG level using segment-adult distribution in CBG	B	Segment	1,177	99%
Retirement product penetration	Percent of households in a segment likely to own any type of retirement product. Rolled up and aggregated at CBG level using segment-households distribution in CBG	B	Segment	1,177	99%

*Refers to the granularity in the primary data source. All variables have been rolled up to the U.S. Census Block Group in our analysis.
**Our dataset contains 217,739 records

Table A.1.B
STATISTICAL ANALYSIS INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—RACE OR ETHNICITY

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Asian or Asian American	Percent of the total population that identifies as not Hispanic and Asian only.	A	U.S. Census block group	0	100%
Black or African American	Percent of the total population that identifies as not Hispanic and Black/African American only.	A	U.S. Census block group	0	100%
Hispanic or Latino	Percent of the total population that identifies as Hispanic only.	A	U.S. Census block group	0	100%
White	Percent of the total population that identifies as not Hispanic and white only.	A	U.S. Census block group	0	100%
Native American or Alaska Native	Percent of the total population that identifies as not Hispanic and American Indian and Alaska Native alone only.	A	U.S. Census block group	0	100%
Multiple Races	Percent of the total population that identifies as not Hispanic; two or more races.	A	U.S. Census block group	0	100%
Native Hawaiian or Pacific Islander	Percent of the total population that identifies as not Hispanic and Native Hawaiian or Other Pacific Islander only.	A	U.S. Census block group	0	100%
Other Race or Ethnicity	Percent of the total population that identifies as not Hispanic and some other race only.	A	U.S. Census block group	0	100%

*Refers to the granularity in the primary data source. All variables have been rolled up to the U.S. Census Block Group in our analysis.
**Our dataset contains 217,739 records

Table A.1.C

STATISTICAL ANALYSIS INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—WEALTH

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Net worth	Mean of household net worth in a CBG	C	Household	1,176	99%
Household Income**	Median household income in the past 12 months (in 2019 inflation-adjusted dollars)	A	U.S. Census block group	7,414	97%

*Refers to the granularity in the primary data source. All variables have been rolled up to the U.S. Census Block Group in our analysis.
**Our dataset contains 217,739 records

Table A.1.D

STATISTICAL ANALYSIS INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—EDUCATIONAL ATTAINMENT

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Education: less than High School Degree	Proportion of population with less than high school degree in citizens aged 18 years and greater in CBG	A	U.S. Census block group	0	100%
Education: High School Degree	Proportion of population with a high school degree in citizens aged 18 years and greater in CBG	A	U.S. Census block group	0	100%
Education: Some College or Associates Degree	Proportion of population with some college or associates degree in citizens aged 18 years and greater in CBG	A	U.S. Census block group	0	100%
Education: Bachelor's Degree	Proportion of population with a college degree in citizens aged 18 years and greater in CBG	A	U.S. Census block group	0	100%
Education: Graduate Degree	Proportion of population with a graduate degree in citizens aged 18 years and greater in CBG	A	U.S. Census block group	0	100%

Table A.1.E

STATISTICAL ANALYSIS INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—FAMILY SIZE

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Non-Family Household	Proportion of non-family households in CBG	A	U.S. Census block group	0	100%
Household Size: 2 people	Proportion of 2-person family households in CBG	A	U.S. Census block group	0	100%
Household Size: 3 people	Proportion of 3-person family households in CBG	A	U.S. Census block group	0	100%
Household Size: 4+ person	Proportion of 4 plus person family households in CBG	A	U.S. Census block group	0	100%

Table A.1.F

STATISTICAL ANALYSIS OF INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—MARITAL STATUS

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Never Married	Proportion of never married in the population aged 15 years and greater in CBG	A	U.S. Census block group	0	100%
Married	Proportion of now married in the population aged 15 years and greater in CBG	A	U.S. Census block group	0	100%
Divorced	Proportion of divorced in the population aged 15 years and greater in CBG	A	U.S. Census block group	0	100%
Widowed	Proportion of widowed in the population aged 15 years and greater in CBG	A	U.S. Census block group	0	100%

Table A.1.G
STATISTICAL ANALYSIS OF INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—URBANICITY

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Urban	Binary indicator; 1 if ZIP5 is Urban, 0 otherwise	A	Zip-5	565	100%
Suburban	Binary indicator; 1 if ZIP5 is Suburban, 0 otherwise	A	Zip-5	565	100%
Rural	Binary indicator; 1 if ZIP5 is Rural, 0 otherwise	A	Zip-5	565	100%

Table A.1.H
STATISTICAL ANALYSIS OF INDEPENDENT VARIABLES BY SOURCE AND LEVEL OF GRANULARITY—OTHER

Independent Variables	Description	Source	Granularity*	# Missing Records**	Fill Rate
Age	Median age of total population in CBG	A	U.S. Census block group	1,119	99%
Male	Proportion of male population in CBG	A	U.S. Census block group	0	100%
Female	Proportion of female population in CBG	A	U.S. Census block group	0	100%
Workers drove or carpooled	Proportion of those who drove or carpooled to work in workers aged 16 years and greater in CBG	A	U.S. Census block group	29	100%
Internet Access	Proportion of households with internet access in CBG	A	U.S. Census block group	0	100%
Employed	Proportion of employed in population aged 16 years and greater in CBG	A	U.S. Census block group	29	100%
Limited English Speaking	Proportion of households with limited English-speaking status in CBG	A	U.S. Census block group	0	100%
Foreign born	Proportion of foreign born in total population in CBG	A	U.S. Census block group	0	100%

In addition, we considered other demographic variables that were either ultimately dropped from our model or not found in the available data sets. These variables are summarized in Table A.2.

Table A.2
ADDITIONAL VARIABLES CONSIDERED BUT NOT INCLUDED IN REGRESSIONS

Variable	Reason for Exclusion
Employment status	High correlation with net worth or income band
Income distribution within CBG	High correlation with net worth or income band
Home value	High correlation with net worth or income band
Healthcare coverage (Medicare, Medicaid, HMO or Traditional healthcare coverage)	VIF greater than 5*
Sex	Found not to significantly contribute to the forward regressions
Access to insurance	Not available in data
Multi-generational household	Not available in data
First generation to attend college	Not available in data
First generation born in the U.S.	Not available in data
Personal mobility and/or congregate care setting	Not available in data

Appendix B: Regression Tables

Table B.1
HOMEOWNERS OR RENTERS—EXPANDED FOR NET WORTH AND OTHER DEMOGRAPHICS (EFNWOD MODEL)
REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	1.53		26.90%	5.68	1	2.05	0.00%
Asian or Asian American	−4.22%	−0.03%	0.10%	−29.26	−4.50%	−3.90%	0.00%
Black or African American	−3.14%	−0.02%	0.10%	−42.36	−3.30%	−3.00%	0.00%
Hispanic or Latino	−4.12%	−0.02%	0.10%	−54.73	−4.30%	−4.00%	0.00%
White	0.00%	0.02%	0.00%	0	0.00%	0.00%	0.00%
Native American	−5.23%	−0.04%	0.30%	−15.5	−5.90%	−4.60%	0.00%
Mult-Ethnic	−8.79%	−0.07%	0.40%	−23	−9.50%	−8.00%	0.00%
Pacific Islander	−6.68%	−0.05%	1.10%	−6.22	−8.80%	−4.60%	0.00%
Other	−5.91%	−0.04%	1.10%	−5.56	−8.00%	−3.80%	0.00%
No High School Degree	−17.03%	−0.15%	0.20%	−79.2	−17.50%	−16.60%	0.00%
High School Grad	−0.58%	0.02%	0.20%	−3.49	−0.90%	−0.30%	0.00%
Some College	0.00%	0.02%	0.00%	0	0.00%	0.00%	0.00%
College Degree	1.34%	0.04%	0.20%	6.87	1.00%	1.70%	0.00%
Graduate Degree	−6.56%	−0.04%	0.20%	−32.5	−7.00%	−6.20%	0.00%
Never Married	−6.45%	−0.04%	0.20%	−41.35	−6.80%	−6.10%	0.00%
Currently Married	0.00%	0.02%	0.00%	0	0.00%	0.00%	0.00%
Divorced	−3.46%	−0.01%	0.30%	−13.56	−4.00%	−3.00%	0.00%
Widowed	7.93%	0.10%	0.30%	23.36	7.30%	8.60%	0.00%
Non-Family HHs	0.00%	−0.03%	0.00%	0	0.00%	0.00%	0.00%
HHs w/ 2 Members	3.29%	0.01%	0.20%	19.3	3.00%	3.60%	0.00%
HHs w/ 3 Members	4.67%	0.02%	0.20%	25.75	4.30%	5.00%	0.00%
HHs w/ 4+ Members	4.89%	0.02%	0.10%	32.85	4.60%	5.20%	0.00%
Urban	X	X	X	X	X	X	X
Suburban	X	X	X	X	X	X	X
Rural	X	X	X	X	X	X	X
Internet Access	9.72%	0.10%	0.10%	66.9	9.40%	10.00%	0.00%
Median Age	X	X	X	X	X	X	X
Drove or Carpooled	6.05%	0.06%	0.10%	61.63	5.90%	6.20%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	X	X	X	X	X	X	X
MAPE							6.10%
RMSE							5.49
BIC							1,243,154.01
Adjusted R-Squared							81.14%

Table B.2
HOMEOWNERS OR RENTERS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: LESS THAN $40,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	45.5		67.50%	67.36	44.17	46.82	0.00%
Asian or Asian American	−5.29%	−0.03%	0.70%	−7.33	−6.70%	−3.90%	0.00%
Black or African American	−7.11%	−0.05%	0.20%	−41.56	−7.40%	−6.80%	0.00%
Hispanic or Latino	−4.58%	−0.02%	0.30%	−17.89	−5.10%	−4.10%	0.00%
White	0.00%	0.03%					
Native American	−7.01%	−0.04%	0.60%	−11.04	−8.30%	−5.80%	0.00%
Mult-Ethnic	−20.75%	−0.18%	1.10%	−19.2	−22.90%	−18.60%	0.00%
Pacific Islander	−12.52%	−0.10%	3.70%	−3.35	−19.80%	−5.20%	0.10%
Other	−18.01%	−0.15%	3.30%	−5.49	−24.40%	−11.60%	0.00%
No High School Degree	−22.10%	−0.24%	0.50%	−43.19	−23.10%	−21.10%	0.00%
High School Grad	−6.75%	−0.09%	0.40%	−15.05	−7.60%	−5.90%	0.00%
Some College	0.00%	−0.02%					
College Degree	16.10%	0.14%	0.70%	21.82	14.70%	17.60%	0.00%
Graduate Degree	30.49%	0.28%	1.00%	29.5	28.50%	32.50%	0.00%
Never Married	−11.42%	−0.06%	0.50%	−25.26	−12.30%	−10.50%	0.00%
Currently Married	0.00%	0.05%					
Divorced	−16.00%	−0.11%	0.70%	−24.05	−17.30%	−14.70%	0.00%
Widowed	2.53%	0.08%	0.90%	2.79	0.80%	4.30%	0.50%
Non-Family HHs	0.00%	−0.12%					
HHs w/ 2 Members	15.21%	0.04%	0.50%	32.82	14.30%	16.10%	0.00%
HHs w/ 3 Members	15.63%	0.04%	0.50%	29.72	14.60%	16.70%	0.00%
HHs w/ 4+ Members	22.22%	0.11%	0.50%	45.14	21.30%	23.20%	0.00%
Urban	X	X	X	X	X	X	X
Suburban	X	X	X	X	X	X	X
Rural	X	X	X	X	X	X	X
Internet Access	5.99%	0.06%	0.30%	17.58	5.30%	6.70%	0.00%
Median Age	0.3074	0.0031	0.006	50.29	0.295	0.319	0
Drove or Carpooled	4.94%	0.05%	0.30%	17.19	4.40%	5.50%	0.00%
Foreign Born	−0.113	−0.0011	0.005	−23.2	−0.123	−0.103	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							10.48%
RMSE							7.63
BIC							278,423.86
Adjusted R-Squared							48.84%

Table B.3

HOMEOWNERS OR RENTERS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $40,000 AND $53,000
(EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	52.26		69.80%	74.88	50.89	53.62	0.00%
Asian or Asian American	−2.69%	0.00%	0.60%	−4.55	−3.90%	−1.50%	0.00%
Black or African American	−8.12%	−0.05%	0.20%	−40.11	−8.50%	−7.70%	0.00%
Hispanic or Latino	−7.04%	−0.04%	0.30%	−27.6	−7.50%	−6.50%	0.00%
White	0.00%	0.03%					
Native American	−8.74%	−0.06%	0.80%	−10.54	−10.40%	−7.10%	0.00%
Mult-Ethnic	−15.76%	−0.13%	1.10%	−14.34	−17.90%	−13.60%	0.00%
Pacific Islander	−18.06%	−0.15%	3.10%	−5.9	−24.10%	−12.10%	0.00%
Other	−12.49%	−0.10%	3.10%	−4.01	−18.60%	−6.40%	0.00%
No High School Degree	−20.90%	−0.21%	0.60%	−37.19	−22.00%	−19.80%	0.00%
High School Grad	−7.13%	−0.07%	0.40%	−16.35	−8.00%	−6.30%	0.00%
Some College	0.00%	0.00%					
College Degree	12.20%	0.12%	0.60%	19.81	11.00%	13.40%	0.00%
Graduate Degree	19.28%	0.19%	0.80%	24.11	17.70%	20.80%	0.00%
Never Married	−7.75%	−0.05%	0.40%	−17.27	−8.60%	−6.90%	0.00%
Currently Married	0.00%	0.03%					
Divorced	−9.57%	−0.06%	0.70%	−14.31	−10.90%	−8.30%	0.00%
Widowed	6.56%	0.10%	0.90%	7.03	4.70%	8.40%	0.00%
Non-Family HHs	0.00%	−0.10%					
HHs w/ 2 Members	11.15%	0.02%	0.50%	23.71	10.20%	12.10%	0.00%
HHs w/ 3 members	12.21%	0.03%	0.50%	23.55	11.20%	13.20%	0.00%
HHs w/ 4+ Members	20.86%	0.11%	0.50%	43.67	19.90%	21.80%	0.00%
Urban	0	0.0035					
Suburban	−0.1511	0.002	0.096	−1.58	−0.339	0.036	0.114
Rural	−1.5067	−0.0115	0.12	−12.55	−1.742	−1.271	0
Internet Access	6.38%	0.06%	0.40%	16.71	5.60%	7.10%	0.00%
Median Age	0.2764	0.0028	0.006	46.52	0.265	0.288	0
Drove or Carpooled	4.62%	0.05%	0.30%	15.22	4.00%	5.20%	0.00%
Foreign Born	−0.1164	−0.0012	0.005	−24.6	−0.126	−0.107	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							7.82%
RMSE							6.8
BIC							271,681.19
Adjusted R-Squared							45.20%

Table B.4

HOMEOWNERS OR RENTERS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $53,000 AND $67,000
(EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	56.47		66.00%	85.59	55.18	57.77	0.00%
Asian or Asian American	−4.19%	−0.01%	0.50%	−9.15	−5.10%	−3.30%	0.00%
Black or African American	−7.55%	−0.05%	0.20%	−36.27	−8.00%	−7.10%	0.00%
Hispanic or Latino	−7.81%	−0.05%	0.20%	−35.44	−8.20%	−7.40%	0.00%
White	0.00%	0.03%					
Native American	−10.11%	−0.07%	1.10%	−8.97	−12.30%	−7.90%	0.00%
Mult-Ethnic	−8.71%	−0.06%	1.00%	−8.74	−10.70%	−6.80%	0.00%
Pacific Islander	−15.07%	−0.12%	2.60%	−5.73	−20.20%	−9.90%	0.00%
Other	−12.58%	−0.10%	2.50%	−5.13	−17.40%	−7.80%	0.00%
No High School Degree	−18.41%	−0.17%	0.60%	−32.24	−19.50%	−17.30%	0.00%
High School Grad	−7.12%	−0.06%	0.40%	−17.28	−7.90%	−6.30%	0.00%
Some College	0.00%	0.01%					
College Degree	6.90%	0.08%	0.50%	13.37	5.90%	7.90%	0.00%
Graduate Degree	15.00%	0.16%	0.60%	24.14	13.80%	16.20%	0.00%
Never Married	−5.55%	−0.03%	0.40%	−13.11	−6.40%	−4.70%	0.00%
Currently Married	0.00%	0.02%					
Divorced	−8.14%	−0.06%	0.60%	−12.68	−9.40%	−6.90%	0.00%
Widowed	7.41%	0.10%	0.90%	8.15	5.60%	9.20%	0.00%
Non-Family HHs	0.00%	−0.09%					
HHs w/ 2 members	10.53%	0.02%	0.40%	23.94	9.70%	11.40%	0.00%
HHs w/ 3 members	10.73%	0.02%	0.50%	22.37	9.80%	11.70%	0.00%
HHs w/ 4+ members	18.75%	0.10%	0.40%	42.92	17.90%	19.60%	0.00%
Urban	0	0.0066					
Suburban	−0.449	0.0021	0.088	−5.08	−0.622	−0.276	0
Rural	−2.2557	−0.0159	0.114	−19.78	−2.479	−2.032	0
Internet Access	6.51%	0.07%	0.40%	16.43	5.70%	7.30%	0.00%
Median Age	0.2238	0.0022	0.005	41.01	0.213	0.234	0
Drove or Carpooled	6.22%	0.06%	0.30%	22.81	5.70%	6.70%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	−0.1471	−0.0015	0.006	−22.91	−0.16	−0.135	0
MAPE							6.16%
RMSE							5.96
BIC							249,082.17
Adjusted R-Squared							41.72%

Table B.5

HOMEOWNERS OR RENTERS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $67,000 AND $90,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	57.31		56.80%	100.88	56.2	58.42	0.00%
Asian or Asian American	0.49%	0.02%	0.40%	1.38	−0.20%	1.20%	16.80%
Black or African American	−5.75%	−0.04%	0.20%	−30.71	−6.10%	−5.40%	0.00%
Hispanic or Latino	−5.51%	−0.04%	0.20%	−26.3	−5.90%	−5.10%	0.00%
White	0.00%	0.02%					
Native American	−10.64%	−0.09%	1.30%	−8.23	−13.20%	−8.10%	0.00%
Mult-Ethnic	−4.76%	−0.03%	0.80%	−6.03	−6.30%	−3.20%	0.00%
Pacific Islander	−17.47%	−0.16%	1.80%	−9.45	−21.10%	−13.80%	0.00%
Other	−12.99%	−0.11%	2.00%	−6.51	−16.90%	−9.10%	0.00%
No High School Degree	−17.60%	−0.16%	0.50%	−32.37	−18.70%	−16.50%	0.00%
High School Grad	−7.31%	−0.06%	0.40%	−20.25	−8.00%	−6.60%	0.00%
Some College	0.00%	0.02%					
College Degree	5.78%	0.08%	0.40%	14.89	5.00%	6.50%	0.00%
Graduate Degree	9.66%	0.11%	0.40%	22.65	8.80%	10.50%	0.00%
Never Married	−0.86%	−0.01%	0.40%	−2.43	−1.60%	−0.20%	1.50%
Currently Married	0.00%	0.00%					
Divorced	−2.98%	−0.03%	0.60%	−5.34	−4.10%	−1.90%	0.00%
Widowed	9.69%	0.10%	0.80%	12.25	8.10%	11.20%	0.00%
Non-Family HHs	0.00%	−0.09%					
HHs w/ 2 Members	9.19%	0.00%	0.40%	25.01	8.50%	9.90%	0.00%
HHs w/ 3 Members	12.86%	0.04%	0.40%	33.23	12.10%	13.60%	0.00%
HHs w/ 4+ Members	19.80%	0.11%	0.30%	57.8	19.10%	20.50%	0.00%
Urban	0	0.0055					
Suburban	−0.2462	0.003	0.069	−3.58	−0.381	−0.111	0
Rural	−2.3164	−0.0177	0.104	−22.2	−2.521	−2.112	0
Internet Access	7.36%	0.07%	0.40%	19.51	6.60%	8.10%	0.00%
Median Age	0.2211	0.0022	0.005	48.19	0.212	0.23	0
Drove or Carpooled	5.30%	0.05%	0.20%	24.53	4.90%	5.70%	0.00%
Foreign Born	−0.0498	−0.0005	0.004	−13.31	−0.057	−0.042	0
Limited English speaking	−0.1064	−0.0011	0.006	−16.74	−0.119	−0.094	0
MAPE							4.41%
RMSE							4.8
BIC							232,652.48
Adjusted R-Squared							42.56%

Table B.6

HOMEOWNERS OR RENTERS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: GREATER THAN $90,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	70.9		30.00%	235.97	70.32	71.49	0.00%
Asian or Asian American	−1.54%	0.00%	0.10%	−10.63	−1.80%	−1.30%	0.00%
Black or African American	−3.57%	−0.02%	0.10%	−24.48	−3.90%	−3.30%	0.00%
Hispanic or Latino	−5.35%	−0.04%	0.10%	−37.95	−5.60%	−5.10%	0.00%
White	0.00%	0.02%					
Native American	−12.44%	−0.11%	1.30%	−9.64	−15.00%	−9.90%	0.00%
Mult-Ethnic	−1.21%	0.00%	0.50%	−2.6	−2.10%	−0.30%	0.90%
Pacific Islander	−12.80%	−0.11%	1.40%	−9.42	−15.50%	−10.10%	0.00%
Other	−8.01%	−0.06%	1.40%	−5.68	−10.80%	−5.20%	0.00%
No High School Degree	−14.50%	−0.12%	0.40%	−32.25	−15.30%	−13.60%	0.00%
High School Grad	−6.95%	−0.04%	0.30%	−25.6	−7.50%	−6.40%	0.00%
Some College	0.00%	0.03%					
College Degree	2.12%	0.05%	0.20%	9.46	1.70%	2.60%	0.00%
Graduate Degree	3.22%	0.06%	0.20%	16.15	2.80%	3.60%	0.00%
Never Married	0.01%	−0.01%	0.20%	0.06	−0.40%	0.50%	95.20%
Currently Married	0.00%	−0.01%					
Divorced	1.46%	0.01%	0.40%	3.63	0.70%	2.20%	0.00%
Widowed	10.80%	0.10%	0.50%	20.1	9.70%	11.80%	0.00%
Non-Family HHs	0.00%	−0.08%					
HHs w/ 2 Members	8.50%	0.01%	0.20%	36.37	8.00%	9.00%	0.00%
HHs w/ 3 Members	12.36%	0.05%	0.20%	53.05	11.90%	12.80%	0.00%
HHs w/ 4+ Members	15.42%	0.08%	0.20%	82.19	15.10%	15.80%	0.00%
Urban	0	0.0035					
Suburban	0.0996	0.0045	0.043	2.34	0.016	0.183	0.019
Rural	−2.3829	−0.0203	0.117	−20.34	−2.613	−2.153	0
Internet Access	X	X	X	X	X	X	X
Median Age	0.1405	0.0014	0.003	46.68	0.135	0.146	0
Drove or Carpooled	4.97%	0.05%	0.10%	41.94	4.70%	5.20%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	−0.0815	−0.0008	0.004	−18.21	−0.09	−0.073	0
MAPE							2.35%
RMSE							3.02
BIC							203,654.44
Adjusted R-Squared							50.04%

Table B.7

LIFE INSURANCE—EXPANDED FOR NET WORTH AND OTHER DEMOGRAPHICS (EFNWOD MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	−8.97	0	13.70%	−65.37	−9.24	−8.7	0.00%
Asian or Asian American	−3.31%	−0.02%	0.10%	−37.46	−3.50%	−3.10%	0.00%
Black or African American	−1.62%	0.00%	0.00%	−38.78	−1.70%	−1.50%	0.00%
Hispanic or Latino	−3.45%	−0.02%	0.00%	−76.1	−3.50%	−3.40%	0.00%
White	0.00%	0.01%	0.00%	0	0.00%	0.00%	0.00%
Native American	−4.05%	−0.03%	0.20%	−19.59	−4.50%	−3.60%	0.00%
Mult-Ethnic	−7.37%	−0.06%	0.20%	−31.44	−7.80%	−6.90%	0.00%
Pacific Islander	−9.99%	−0.09%	0.70%	−15.15	−11.30%	−8.70%	0.00%
Other	−2.52%	−0.01%	0.70%	−3.87	−3.80%	−1.20%	0.00%
No High School Degree	−12.10%	−0.11%	0.10%	−91.26	−12.40%	−11.80%	0.00%
High School Grad	−1.87%	−0.01%	0.10%	−18.07	−2.10%	−1.70%	0.00%
Some College	0.00%	0.01%	0.00%	0	0.00%	0.00%	0.00%
College Degree	3.37%	0.05%	0.10%	28.18	3.10%	3.60%	0.00%
Graduate Degree	−1.05%	0.00%	0.10%	−8.53	−1.30%	−0.80%	0.00%
Never Married	X	X	X	X	X	X	X
Currently Married	X	X	X	X	X	X	X
Divorced	X	X	X	X	X	X	X
Widowed	X	X	X	X	X	X	X
Non-Family HHs	0.00%	−0.03%	0.00%	0	0.00%	0.00%	0.00%
HHs w/ 2 Members	2.64%	−0.01%	0.10%	29.87	2.50%	2.80%	0.00%
HHs w/ 3 Members	5.73%	0.03%	0.10%	54.27	5.50%	5.90%	0.00%
HHs w/ 4+ Members	7.28%	0.04%	0.10%	84.5	7.10%	7.40%	0.00%
Urban	X	X	X	X	X	X	X
Suburban	X	X	X	X	X	X	X
Rural	X	X	X	X	X	X	X
Internet Access	4.87%	0.05%	0.10%	55.46	4.70%	5.00%	0.00%
Median Age	0.0788	0.0008	0.001	66.29	0.076	0.081	0
Drove or Carpooled	4.75%	0.05%	0.10%	81.25	4.60%	4.90%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	X	X	X	X	X	X	X
MAPE							6.73%
RMSE							3.37
BIC							1,048,994.54
Adjusted R-Squared							82.80%

Table B.8

LIFE INSURANCE—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: LESS THAN $40,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	27.14		31.10%	87.35	26.53	27.75	0.00%
Asian or Asian American	−3.19%	−0.02%	0.40%	−8.66	−3.90%	−2.50%	0.00%
Black or African American	−3.79%	−0.02%	0.10%	−43.26	−4.00%	−3.60%	0.00%
Hispanic or Latino	−2.94%	−0.01%	0.10%	−22.48	−3.20%	−2.70%	0.00%
White	0.00%	0.01%					
Native American	−3.90%	−0.02%	0.30%	−11.99	−4.50%	−3.30%	0.00%
Mult-Ethnic	−10.77%	−0.09%	0.60%	−19.45	−11.90%	−9.70%	0.00%
Pacific Islander	−5.37%	−0.04%	1.90%	−2.81	−9.10%	−1.60%	0.50%
Other	−8.21%	−0.07%	1.70%	−4.89	−11.50%	−4.90%	0.00%
No High School Degree	−12.79%	−0.14%	0.30%	−48.88	−13.30%	−12.30%	0.00%
High School Grad	−4.13%	−0.05%	0.20%	−17.98	−4.60%	−3.70%	0.00%
Some College	0.00%	−0.01%					
College Degree	9.56%	0.08%	0.40%	25.27	8.80%	10.30%	0.00%
Graduate Degree	17.50%	0.16%	0.50%	33.20	16.50%	18.50%	0.00%
Never Married	−5.73%	−0.03%	0.20%	−25.26	−6.20%	−5.30%	0.00%
Currently Married	0.00%	0.02%					
Divorced	−6.97%	−0.05%	0.30%	−20.46	−7.60%	−6.30%	0.00%
Widowed	4.02%	0.06%	0.50%	8.65	3.10%	4.90%	0.00%
Non-Family HHs	0.00%	−0.05%					
HHs w/ 2 Members	6.66%	0.02%	0.20%	28.08	6.20%	7.10%	0.00%
HHs w/ 3 Members	6.43%	0.02%	0.30%	23.92	5.90%	7.00%	0.00%
HHs w/ 4+ Members	9.25%	0.04%	0.30%	36.72	8.80%	9.70%	0.00%
Urban	X	X	X	X	X	X	X
Suburban	X	X	X	X	X	X	X
Rural	X	X	X	X	X	X	X
Internet Access	3.21%	0.03%	0.20%	18.35	2.90%	3.50%	0.00%
Median Age	15.66%	0.16%	0.30%	50.09	15.10%	16.30%	0.00%
Drove or Carpooled	X	X	X	X	X	X	X
Foreign born	−3.63%	−0.04%	0.20%	−14.76	−4.10%	−3.20%	0.00%
Limited English speaking	X	X	X	X	X	X	X
MAPE							9.66%
RMSE							3.91
BIC							224,526.02
Adjusted R-Squared							50.43%

Table B.9

LIFE INSURANCE—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $40,000 AND $53,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	30.01		37.40%	80.23	29.27	30.74	0.00%
Asian or Asian American	−2.73%	−0.01%	0.30%	−8.31	−3.40%	−2.10%	0.00%
Black or African American	−4.94%	−0.03%	0.10%	−41.48	−5.20%	−4.70%	0.00%
Hispanic or Latino	−4.68%	−0.03%	0.10%	−33.9	−5.00%	−4.40%	0.00%
White	0.00%	0.02%					
Native American	−5.26%	−0.03%	0.50%	−10.7	−6.20%	−4.30%	0.00%
Mult-Ethnic	−10.56%	−0.09%	0.70%	−16.18	−11.80%	−9.30%	0.00%
Pacific Islander	−11.67%	−0.10%	1.80%	−6.42	−15.20%	−8.10%	0.00%
Other	−7.28%	−0.05%	1.80%	−3.97	−10.90%	−3.70%	0.00%
No High School Degree	−14.28%	−0.14%	0.30%	−42.75	−14.90%	−13.60%	0.00%
High School Grad	−4.86%	−0.05%	0.30%	−18.8	−5.40%	−4.40%	0.00%
Some College	0.00%	0.00%					
College Degree	7.63%	0.08%	0.40%	21	6.90%	8.30%	0.00%
Graduate Degree	11.80%	0.12%	0.50%	25.13	10.90%	12.70%	0.00%
Never Married	−5.19%	−0.03%	0.30%	−19.72	−5.70%	−4.70%	0.00%
Currently Married	0.00%	0.02%					
Divorced	−6.04%	−0.04%	0.40%	−15.26	−6.80%	−5.30%	0.00%
Widowed	6.27%	0.08%	0.60%	11.33	5.20%	7.40%	0.00%
Non-Family HHs	0.00%	−0.05%					
HHs w/ 2 Members	6.02%	0.01%	0.30%	21.61	5.50%	6.60%	0.00%
HHs w/ 3 Members	6.55%	0.01%	0.30%	21.34	5.90%	7.20%	0.00%
HHs w/ 4+ Members	10.61%	0.06%	0.30%	37.57	10.10%	11.20%	0.00%
Urban	0	0.0013					
Suburban	0.0491	0.0018	0.056	0.87	−0.061	0.159	0.383
Rural	−0.944	−0.0081	0.071	−13.29	−1.083	−0.805	0
Internet Access	3.74%	0.04%	0.20%	16.49	3.30%	4.20%	0.00%
Median Age	0.1582	0.0016	0.003	45.43	0.151	0.165	0
Drove or Carpooled	X	X	X	X	X	X	X
Foreign born	X	X	X	X	X	X	X
Limited English speaking	−0.065	−0.0007	0.004	−18.39	−0.072	−0.058	0
MAPE							8.69%
RMSE							4.03
BIC							229,218.40
Adjusted R-Squared							46.17%

Table B.10

LIFE INSURANCE—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $53,000 AND $67,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	27.98		43.90%	63.78	27.12	28.84	0.00%
Asian or Asian American	−2.32%	0.00%	0.30%	−7.63	−2.90%	−1.70%	0.00%
Black or African American	−4.18%	−0.02%	0.10%	−30.17	−4.40%	−3.90%	0.00%
Hispanic or Latino	−5.65%	−0.04%	0.10%	−38.53	−5.90%	−5.40%	0.00%
White	0.00%	0.02%					
Native American	−7.37%	−0.05%	0.70%	−9.83	−8.80%	−5.90%	0.00%
Mult-Ethnic	−7.32%	−0.05%	0.70%	−11.03	−8.60%	−6.00%	0.00%
Pacific Islander	−14.47%	−0.13%	1.70%	−8.28	−17.90%	−11.00%	0.00%
Other	−5.55%	−0.04%	1.60%	−3.4	−8.70%	−2.30%	0.10%
No High School Degree	−13.93%	−0.13%	0.40%	−36.7	−14.70%	−13.20%	0.00%
High School Grad	−4.53%	−0.04%	0.30%	−16.53	−5.10%	−4.00%	0.00%
Some College	0.00%	0.01%					
College Degree	5.65%	0.06%	0.30%	16.47	5.00%	6.30%	0.00%
Graduate Degree	10.00%	0.11%	0.40%	24.19	9.20%	10.80%	0.00%
Never Married	−3.48%	−0.02%	0.30%	−12.38	−4.00%	−2.90%	0.00%
Currently Married	0.00%	0.01%					
Divorced	−6.56%	−0.05%	0.40%	−15.38	−7.40%	−5.70%	0.00%
Widowed	7.66%	0.09%	0.60%	12.66	6.50%	8.80%	0.00%
Non-Family HHs	0.00%	−0.06%					
HHs w/ 2 Members	6.57%	0.01%	0.30%	22.47	6.00%	7.10%	0.00%
HHs w/ 3 Members	7.43%	0.02%	0.30%	23.3	6.80%	8.10%	0.00%
HHs w/ 4+ Members	11.46%	0.06%	0.30%	39.47	10.90%	12.00%	0.00%
Urban	0	0.0059					
Suburban	−0.4376	0.0015	0.059	−7.44	−0.553	−0.322	0
Rural	−1.8558	−0.0127	0.076	−24.47	−2.004	−1.707	0
Internet Access	4.52%	0.05%	0.30%	17.15	4.00%	5.00%	0.00%
Median Age	0.1431	0.0014	0.004	39.44	0.136	0.15	0
Drove or Carpooled	4.28%	0.04%	0.20%	23.63	3.90%	4.60%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	−0.0624	−0.0006	0.004	−14.62	−0.071	−0.054	0
MAPE							7.73%
RMSE							3.96
BIC							217,379.20
Adjusted R-Squared							41.52%

Table B.11

LIFE INSURANCE—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $67,000 AND $90,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	26.42		42.90%	61.56	25.58	27.26	0.00%
Asian or Asian American	−1.29%	0.00%	0.30%	−4.91	−1.80%	−0.80%	0.00%
Black or African American	−2.84%	−0.01%	0.10%	−20.03	−3.10%	−2.60%	0.00%
Hispanic or Latino	−5.59%	−0.04%	0.20%	−35.65	−5.90%	−5.30%	0.00%
White	0.00%	0.02%					
Native American	−8.63%	−0.07%	1.00%	−8.81	−10.60%	−6.70%	0.00%
Mult-Ethnic	−7.07%	−0.05%	0.60%	−11.82	−8.20%	−5.90%	0.00%
Pacific Islander	−19.86%	−0.18%	1.40%	−14.17	−22.60%	−17.10%	0.00%
Other	−5.50%	−0.04%	1.50%	−3.64	−8.50%	−2.50%	0.00%
No High School Degree	−14.20%	−0.13%	0.40%	−34.51	−14.90%	−13.30%	0.00%
High School Grad	−4.31%	−0.03%	0.30%	−15.75	−4.80%	−3.80%	0.00%
Some College	0.00%	0.01%					
College Degree	5.29%	0.06%	0.30%	17.97	4.70%	5.90%	0.00%
Graduate Degree	7.94%	0.09%	0.30%	24.53	7.30%	8.60%	0.00%
Never Married	−0.98%	−0.01%	0.30%	−3.67	−1.50%	−0.50%	0.00%
Currently Married	0.00%	0.00%					
Divorced	−3.60%	−0.03%	0.40%	−8.53	−4.40%	−2.80%	0.00%
Widowed	10.06%	0.10%	0.60%	16.78	8.90%	11.20%	0.00%
Non-Family HHs	0.00%	−0.07%					
HHs w/ 2 Members	7.27%	0.00%	0.30%	26.11	6.70%	7.80%	0.00%
HHs w/ 3 Members	11.02%	0.04%	0.30%	37.55	10.40%	11.60%	0.00%
HHs w/ 4+ Members	14.46%	0.08%	0.30%	55.67	13.90%	15.00%	0.00%
Urban	0	0.007					
Suburban	−0.5198	0.0018	0.052	−9.96	−0.622	−0.418	0
Rural	−2.2138	−0.0151	0.079	−27.97	−2.369	−2.059	0
Internet Access	4.98%	0.05%	0.30%	17.53	4.40%	5.50%	0.00%
Median Age	0.1357	0.0014	0.003	39.02	0.129	0.143	0
Drove or Carpooled	5.57%	0.06%	0.20%	34.05	5.30%	5.90%	0.00%
Foreign Born	−0.0439	−0.0004	0.003	−16.35	−0.049	−0.039	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							6.42%
RMSE							3.64
BIC							211,137.18
Adjusted R-Squared							42.52%

Table B.12

LIFE INSURANCE—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: GREATER THAN $90,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	30.75		28.00%	109.75	30.2	31.3	0.00%
Asian or Asian American	−2.00%	0.00%	0.20%	−12.07	−2.30%	−1.70%	0.00%
Black or African American	−1.34%	0.00%	0.10%	−9.66	−1.60%	−1.10%	0.00%
Hispanic or Latino	−5.34%	−0.04%	0.10%	−36.64	−5.60%	−5.10%	0.00%
White	0.00%	0.02%					
Native American	−11.01%	−0.09%	1.20%	−9.14	−13.40%	−8.70%	0.00%
Mult-Ethnic	−7.16%	−0.06%	0.40%	−16.47	−8.00%	−6.30%	0.00%
Pacific Islander	−16.22%	−0.15%	1.30%	−12.78	−18.70%	−13.70%	0.00%
Other	−5.86%	−0.04%	1.30%	−4.43	−8.40%	−3.30%	0.00%
No High School Degree	−11.30%	−0.10%	0.40%	−27.15	−12.10%	−10.40%	0.00%
High School Grad	−4.47%	−0.04%	0.30%	−17.64	−5.00%	−4.00%	0.00%
Some College	0.00%	0.01%					
College Degree	4.90%	0.06%	0.20%	23.4	4.50%	5.30%	0.00%
Graduate Degree	6.21%	0.07%	0.20%	33.22	5.80%	6.60%	0.00%
Never Married	0.49%	0.00%	0.20%	2.34	0.10%	0.90%	1.90%
Currently Married	0.00%	−0.01%					
Divorced	−1.00%	−0.02%	0.40%	−2.67	−1.70%	−0.30%	0.80%
Widowed	9.11%	0.09%	0.50%	18.16	8.10%	10.10%	0.00%
Non-Family HHs	0.00%	−0.08%					
HHs w/ 2 Members	9.31%	0.01%	0.20%	42.67	8.90%	9.70%	0.00%
HHs w/ 3 Members	13.30%	0.05%	0.20%	61.18	12.90%	13.70%	0.00%
HHs w/ 4+ Members	15.73%	0.08%	0.20%	89.99	15.40%	16.10%	0.00%
Urban	0	0.0032					
Suburban	0.0898	0.0041	0.04	2.26	0.012	0.168	0.024
Rural	−2.1907	−0.0187	0.109	−20.03	−2.405	−1.976	0
Internet Access	X	X	X	X	X	X	X
Median Age	0.1073	0.0011	0.003	38.04	0.102	0.113	0
Drove or Carpooled	6.19%	0.06%	0.10%	55.23	6.00%	6.40%	0.00%
Foreign Born	−0.0347	−0.0003	0.002	−16.83	−0.039	−0.031	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							4.42%
RMSE							2.82
BIC							198,099.96
Adjusted R-Squared							54.84%

Table B.13
RETIREMENT PRODUCTS—EXPANDED FOR NET WORTH AND OTHER DEMOGRAPHICS (EFNWOD MODEL)
REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	−52.02	0	27.80%	−187.08	−52.56	−51.47	0.00%
Asian or Asian American	1.26%	0.02%	0.20%	5.53	0.80%	1.70%	0.00%
Black or African American	−4.65%	−0.04%	0.10%	−51.45	−4.80%	−4.50%	0.00%
Hispanic or Latino	−2.37%	−0.01%	0.10%	−19.86	−2.60%	−2.10%	0.00%
White	0.00%	0.01%	0.00%	0	0.00%	0.00%	0.00%
Native American	−6.81%	−0.06%	0.40%	−15.53	−7.70%	−6.00%	0.00%
Mult-Ethnic	−7.47%	−0.06%	0.50%	−15.06	−8.40%	−6.50%	0.00%
Pacific Islander	9.97%	0.11%	1.40%	7.13	7.20%	12.70%	0.00%
Other	11.94%	0.13%	1.40%	8.57	9.20%	14.70%	0.00%
No High School Degree	−29.51%	−0.27%	0.30%	−108.01	−30.00%	−29.00%	0.00%
High School Grad	−9.05%	−0.06%	0.20%	−41.94	−9.50%	−8.60%	0.00%
Some College	0.00%	0.03%	0.00%	0	0.00%	0.00%	0.00%
College Degree	15.10%	0.18%	0.30%	59.73	14.60%	15.60%	0.00%
Graduate Degree	−1.66%	0.01%	0.30%	−6.35	−2.20%	−1.10%	0.00%
Never Married	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
Currently Married	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
Divorced	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
Widowed	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
Non-Family HHs	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
HHs w/ 2 Members	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
HHs w/ 3 Members	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
HHs w/ 4+ Members	0.00%	0.00%	0.00%	0	0.00%	0.00%	0.00%
Urban	0	0.0068	0	0	0	0	0
Suburban	0.0216	0.007	0.044	0.49	−0.065	0.109	0.625
Rural	−4.0179	−0.0334	0.06	−66.51	−4.136	−3.9	0
Internet Access	18.03%	0.18%	0.20%	99.68	17.70%	18.40%	0.00%
Median Age	0	0	0	0	0	0	0
Drove or Carpooled	−4.97%	−0.05%	0.10%	−38.88	−5.20%	−4.70%	0.00%
Foreign born	0.1158	0.0012	0.002	52.59	0.112	0.12	0
Limited English speaking	0	0	0	0	0	0	0
MAPE							15.79%
RMSE							7.16
BIC							1,348,685.10
Adjusted R-Squared							87.72%

Table B.14

RETIREMENT PRODUCTS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: LESS THAN $40,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	22.53		82.80%	27.19	20.91	24.15	0.00%
Asian or Asian American	1.12%	0.04%	0.90%	1.28	−0.60%	2.80%	20.00%
Black or African American	−10.02%	−0.07%	0.20%	−46.77	−10.40%	−9.60%	0.00%
Hispanic or Latino	−8.12%	−0.05%	0.30%	−25.7	−8.70%	−7.50%	0.00%
White	0.00%	0.03%					
Native American	−9.83%	−0.07%	0.80%	−12.8	−11.30%	−8.30%	0.00%
Mult-Ethnic	−23.42%	−0.20%	1.30%	−17.9	−26.00%	−20.90%	0.00%
Pacific Islander	7.44%	0.11%	4.50%	1.65	−1.40%	16.30%	9.90%
Other	−7.06%	−0.04%	4.00%	−1.78	−14.80%	0.70%	7.50%
No High School Degree	−29.44%	−0.36%	0.60%	−47.68	−30.60%	−28.20%	0.00%
High School Grad	−12.32%	−0.19%	0.50%	−22.74	−13.40%	−11.30%	0.00%
Some College	0.00%	−0.07%					
College Degree	36.92%	0.30%	0.90%	41.38	35.20%	38.70%	0.00%
Graduate Degree	57.30%	0.51%	1.20%	45.94	54.90%	59.80%	0.00%
Never Married	−5.29%	−0.02%	0.60%	−9.6	−6.40%	−4.20%	0.00%
Currently Married	0.00%	0.04%					
Divorced	−16.30%	−0.13%	0.80%	−20.17	−17.90%	−14.70%	0.00%
Widowed	0.41%	0.04%	1.10%	0.38	−1.70%	2.60%	70.50%
Non-Family HHs	0.00%	−0.07%					
HHs w/ 2 Members	8.69%	0.02%	0.60%	15.5	7.60%	9.80%	0.00%
HHs w/ 3 Members	10.04%	0.03%	0.60%	15.81	8.80%	11.30%	0.00%
HHs w/ 4+ Members	14.20%	0.07%	0.60%	23.88	13.00%	15.40%	0.00%
Urban	0	−0.0019					
Suburban	0.7911	0.006	0.118	6.7	0.56	1.022	0
Rural	−1.6876	−0.0188	0.153	−11.06	−1.987	−1.389	0
Internet Access	10.48%	0.10%	0.40%	25.32	9.70%	11.30%	0.00%
Median Age	0.2297	0.0023	0.007	31.08	0.215	0.244	0
Drove or Carpooled	−7.19%	−0.07%	0.30%	−20.57	−7.90%	−6.50%	0.00%
Foreign Born	0.0993	0.001	0.006	16.75	0.088	0.111	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							35.84%
RMSE							9.21
BIC							293,633.29
Adjusted R-Squared							50.73%

Table B.15

RETIREMENT PRODUCTS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $40,000 AND $53,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	29.04		95.90%	30.27	27.16	30.92	0.00%
Asian or Asian American	4.82%	0.08%	0.80%	5.92	3.20%	6.40%	0.00%
Black or African American	−12.92%	−0.10%	0.30%	−46.45	−13.50%	−12.40%	0.00%
Hispanic or Latino	−8.55%	−0.05%	0.40%	−24.36	−9.20%	−7.90%	0.00%
White	0.00%	0.03%					
Native American	−12.15%	−0.09%	1.10%	−10.66	−14.40%	−9.90%	0.00%
Mult-Ethnic	−16.22%	−0.13%	1.50%	−10.74	−19.20%	−13.30%	0.00%
Pacific Islander	−3.45%	0.00%	4.20%	−0.82	−11.70%	4.80%	41.30%
Other	2.62%	0.06%	4.30%	0.61	−5.80%	11.00%	54.00%
No High School Degree	−35.16%	−0.38%	0.80%	−45.55	−36.70%	−33.60%	0.00%
High School Grad	−16.36%	−0.19%	0.60%	−27.28	−17.50%	−15.20%	0.00%
Some College	0.00%	−0.02%					
College Degree	31.49%	0.29%	0.80%	37.15	29.80%	33.20%	0.00%
Graduate Degree	44.30%	0.42%	1.10%	40.32	42.20%	46.50%	0.00%
Never Married	−2.88%	0.00%	0.60%	−4.66	−4.10%	−1.70%	0.00%
Currently Married	0.00%	0.02%					
Divorced	−15.26%	−0.13%	0.90%	−16.6	−17.10%	−13.50%	0.00%
Widowed	3.05%	0.05%	1.30%	2.38	0.50%	5.60%	1.70%
Non-Family HHs	0.00%	−0.06%					
HHs w/ 2 Members	6.02%	0.00%	0.60%	9.32	4.80%	7.30%	0.00%
HHs w/ 3 Members	7.78%	0.02%	0.70%	10.92	6.40%	9.20%	0.00%
HHs w/ 4+ Members	15.20%	0.09%	0.70%	23.15	13.90%	16.50%	0.00%
Urban	0	0.0036					
Suburban	0.483	0.0084	0.132	3.67	0.225	0.741	0
Rural	−3.7758	−0.0342	0.165	−22.87	−4.099	−3.452	0
Internet Access	13.79%	0.14%	0.50%	26.27	12.80%	14.80%	0.00%
Median Age	0.2904	0.0029	0.008	35.54	0.274	0.306	0
Drove or Carpooled	−8.60%	−0.09%	0.40%	−20.58	−9.40%	−7.80%	0.00%
Foreign born	0.0942	0.0009	0.007	14.49	0.081	0.107	0
Limited English speaking	X	X	X	X	X	X	X
MAPE							22.73%
RMSE							9.35
BIC							297,585.11
Adjusted R-Squared							49.24%

Table B.16

RETIREMENT PRODUCTS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $53,000 AND $67,000
(EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	33.3		96.00%	34.67	31.42	35.19	0.00%
Asian or Asian American	4.71%	0.08%	0.70%	6.35	3.30%	6.20%	0.00%
Black or African American	−12.37%	−0.10%	0.30%	−40.21	−13.00%	−11.80%	0.00%
Hispanic or Latino	−7.30%	−0.04%	0.40%	−19.93	−8.00%	−6.60%	0.00%
White	0.00%	0.03%					
Native American	−14.41%	−0.12%	1.60%	−8.78	−17.60%	−11.20%	0.00%
Mult-Ethnic	−6.89%	−0.04%	1.50%	−4.75	−9.70%	−4.00%	0.00%
Pacific Islander	1.67%	0.04%	3.80%	0.44	−5.80%	9.20%	66.30%
Other	5.68%	0.08%	3.60%	1.58	−1.40%	12.70%	11.50%
No High School Degree	−33.86%	−0.34%	0.80%	−40.74	−35.50%	−32.20%	0.00%
High School Grad	−16.76%	−0.17%	0.60%	−27.96	−17.90%	−15.60%	0.00%
Some College	0.00%	0.00%					
College Degree	23.93%	0.24%	0.80%	31.73	22.40%	25.40%	0.00%
Graduate Degree	33.70%	0.34%	0.90%	37.14	31.90%	35.40%	0.00%
Never Married	−1.65%	0.00%	0.60%	−2.68	−2.90%	−0.40%	0.70%
Currently Married	0.00%	0.02%					
Divorced	−14.03%	−0.12%	0.90%	−15.01	−15.90%	−12.20%	0.00%
Widowed	6.27%	0.08%	1.30%	4.73	3.70%	8.90%	0.00%
Non-Family HHs	0.00%	−0.06%					
HHs w/ 2 Members	6.62%	0.00%	0.60%	10.33	5.40%	7.90%	0.00%
HHs w/ 3 Members	8.22%	0.02%	0.70%	11.76	6.80%	9.60%	0.00%
HHs w/ 4+ Members	14.99%	0.09%	0.60%	23.51	13.70%	16.20%	0.00%
Urban	0	0.0083					
Suburban	−0.0761	0.0076	0.129	−0.59	−0.328	0.176	0.555
Rural	−4.553	−0.0372	0.166	−27.41	−4.879	−4.227	0
Internet Access	14.71%	0.15%	0.60%	25.42	13.60%	15.80%	0.00%
Median Age	0.2777	0.0028	0.008	34.66	0.262	0.293	0
Drove or Carpooled	−6.11%	−0.06%	0.40%	−14.91	−6.90%	−5.30%	0.00%
Foreign Born	0.1325	0.0013	0.007	18.87	0.119	0.146	0
Limited English speaking	−0.1409	−0.0014	0.01	−13.94	−0.161	−0.121	0
MAPE							15.62%
RMSE							8.67
BIC							278,244.70
Adjusted R-Squared							47.91%

Table B.17

RETIREMENT PRODUCTS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: BETWEEN $67,000 AND $90,000
(EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	33.51		82.80%	40.44	31.88	35.13	0.00%
Asian or Asian American	6.43%	0.08%	0.40%	15.75	5.60%	7.20%	0.00%
Black or African American	−10.05%	−0.08%	0.30%	−37.64	−10.60%	−9.50%	0.00%
Hispanic or Latino	−5.71%	−0.04%	0.20%	−23.07	−6.20%	−5.20%	0.00%
White	0.00%	0.02%					
Native American	−16.87%	−0.15%	1.90%	−8.91	−20.60%	−13.20%	0.00%
Mult-Ethnic	−0.39%	0.02%	1.20%	−0.34	−2.70%	1.90%	73.60%
Pacific Islander	−13.08%	−0.11%	2.70%	−4.83	−18.40%	−7.80%	0.00%
Other	2.67%	0.05%	2.90%	0.92	−3.00%	8.40%	35.70%
No High School Degree	−32.66%	−0.30%	0.80%	−41.36	−34.20%	−31.10%	0.00%
High School Grad	−16.61%	−0.14%	0.50%	−31.46	−17.60%	−15.60%	0.00%
Some College	0.00%	0.02%					
College Degree	18.55%	0.21%	0.60%	32.79	17.40%	19.70%	0.00%
Graduate Degree	21.30%	0.24%	0.60%	34.19	20.10%	22.60%	0.00%
Never Married	3.81%	0.03%	0.50%	7.37	2.80%	4.80%	0.00%
Currently Married	0.00%	-0.01%					
Divorced	-7.58%	−0.09%	0.80%	−9.3	−9.20%	−6.00%	0.00%
Widowed	9.88%	0.09%	1.20%	8.53	7.60%	12.10%	0.00%
Non-Family HHs	0.00%	−0.08%					
HHs w/ 2 Members	6.94%	−0.01%	0.50%	12.91	5.90%	8.00%	0.00%
HHs w/ 3 Members	12.62%	0.04%	0.60%	22.29	11.50%	13.70%	0.00%
HHs w/ 4+ Members	19.55%	0.11%	0.50%	39.08	18.60%	20.50%	0.00%
Urban	0	0.0098					
Suburban	−0.1952	0.0079	0.101	−1.94	−0.393	0.002	0.053
Rural	−4.99	−0.0401	0.153	−32.71	−5.294	−4.695	0
Internet Access	15.58%	0.16%	0.50%	28.38	14.50%	16.70%	0.00%
Median Age	0.2994	0.003	0.007	44.98	0.286	0.312	0
Drove or Carpooled	−4.41%	−0.04%	0.30%	−14.55	−5.00%	−3.80%	0.00%
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	X	X	X	X	X	X	X
MAPE							9.59%
RMSE							7.03
BIC							262,299.98
Adjusted R-Squared							48.47%

Table B.18

RETIREMENT PRODUCTS—EXPANDED FOR DEMOGRAPHICS, INCOME BAND: GREATER THAN $90,000 (EFOD-IB MODEL) REGRESSION

	Coeff.	Trans. Coeff	Std Error	t	CI: [0.025	0.975]	P>|t|
Intercept	43.61		55.20%	79.06	42.53	44.69	0.00%
Asian or Asian American	2.35%	0.04%	0.20%	13.2	2.00%	2.70%	0.00%
Black or African American	−8.11%	−0.06%	0.20%	−39.58	−8.50%	−7.70%	0.00%
Hispanic or Latino	−5.55%	−0.04%	0.20%	−28.97	−5.90%	−5.20%	0.00%
White	0.00%	0.02%					
Native American	−17.67%	−0.16%	1.80%	−9.74	−21.20%	−14.10%	0.00%
Mult-Ethnic	2.81%	0.05%	0.70%	4.3	1.50%	4.10%	0.00%
Pacific Islander	−12.49%	−0.11%	1.90%	−6.53	−16.20%	−8.70%	0.00%
Other	−1.65%	0.00%	2.00%	−0.83	−5.50%	2.20%	40.60%
No High School Degree	−21.42%	−0.19%	0.60%	−33.91	−22.70%	−20.20%	0.00%
High School Grad	−13.71%	−0.12%	0.40%	−35.67	−14.50%	−13.00%	0.00%
Some College	0.00%	0.02%					
College Degree	12.61%	0.15%	0.30%	40.4	12.00%	13.20%	0.00%
Graduate Degree	14.00%	0.16%	0.30%	52.13	13.50%	14.50%	0.00%
Never Married	5.54%	0.03%	0.30%	17.87	4.90%	6.10%	0.00%
Currently Married	0.00%	−0.02%					
Divorced	−1.51%	−0.04%	0.60%	−2.67	−2.60%	−0.40%	0.70%
Widowed	12.19%	0.10%	0.80%	15.97	10.70%	13.70%	0.00%
Non-Family HHs	0.00%	−0.07%					
HHs w/ 2 Members	6.95%	0.00%	0.30%	21.01	6.30%	7.60%	0.00%
HHs w/ 3 Members	12.30%	0.05%	0.30%	37.51	11.70%	13.00%	0.00%
HHs w/ 4+ Members	16.08%	0.09%	0.30%	60.61	15.60%	16.60%	0.00%
Urban	0	0.0101					
Suburban	−0.1112	0.0089	0.059	−1.88	−0.227	0.005	0.06
Rural	−5.4351	−0.0443	0.165	−32.98	−5.758	−5.112	0
Internet Access	10.54%	0.11%	0.40%	23.64	9.70%	11.40%	0.00%
Median Age	0.1999	0.002	0.004	47.19	0.192	0.208	0
Drove or Carpooled	X	X	X	X	X	X	X
Foreign Born	X	X	X	X	X	X	X
Limited English speaking	X	X	X	X	X	X	X
MAPE							4.29%
RMSE							4.25
BIC							231,160.19
Adjusted R-Squared							57.48%

Appendix C: Literature Review

We reviewed the existing literature on income and wealth inequality with a particular focus on research relating to life insurance, personal property insurance and retirement products for the purposes of refining our project goal and research questions as well as providing context around the results of our statistical analysis. We specifically sought studies that examined the disparities in these relationships across key demographic groups, including race or ethnicity; age; sex; marital status; education level; internet access; employment type; rural, urban or suburban geography; and immigration status. This review is divided into three sections. The first covers a broad range of literature on disparities in wealth and income among racial and ethnic groups. This is followed by more focused sections on insurance and retirement products and their intersection with issues of wealth, income and inequality.

A note on terminology for races and ethnicities in the literature review: our summaries reflect the SOA Research Institute's preferred language.

2.1 RACIAL DISPARITIES IN WEALTH AND INCOME

> Neil Bhutta, Andrew C. Chang, Lisa J. Dettling, and Joanne W. Hsu with assistance from Julia Hewitt. "Disparities in Wealth by Race and Ethnicity in the 2019 Survey of Consumer Finances." FEDS Notes, Sept. 28, 2020, https://www.federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth-by-race-and-ethnicity-in-the-2019-survey-of-consumer-finances-20200928.htm

The Federal Reserve Board conducts the Survey of Consumer Finances (SCF) every three years to collect U.S. household financial information including family income, net worth, balance sheet components, credit use and other financial outcomes. The authors note that the latest survey was conducted in 2019, prior to the COVID-19 pandemic. Trends observed in 2019 may not be applicable to U.S. families in 2020 and 2021.

In addition, it is important to understand that the types and number of families in each race or ethnicity group change across time as a result of changes in immigration, population aging and even self-identification patterns. For example, the growth in Hispanic or Latino wealth between the last two surveys may be partly due to shifts in the types of families in the U.S. Hispanic or Latino population. Note: the SCF tracks races and ethnicities with labels as follows: Black or African American, White, non-Hispanic, Hispanic, and other. Using data from the Federal Reserve Board's Surveys of Consumer Finances (SCF), this article presents an overview on six major components of individual wealth and touches on racial disparities in these components: They are:

- Wealth holding trends, 2016-19: Black or African American and Hispanic or Latino families experienced faster wealth growth rates, 33 and 65% respectively, than those of white families, which saw their wealth rise 3%. Other families experienced increased rates of 8%.

- However, in 2019, both median and mean family wealth remain significantly higher for White families ($188,200 and $983,400, respectively) compared to Black or African American families' median and mean wealth ($24,100 and $142,500, respectively) and Hispanic or Latino families' median and mean wealth ($36,100 and $165,500, respectively).

  Wealth across the lifecycle: the SCF also tracks the amount of wealth someone accumulates across different ages of their life. Disparities in wealth across racial groups are observed in all age groups (less than 35, 35–54, and 55 and older). In 2019, for families aged less than 35, the median net worth for Black or African American families is $600 compared to white families ($25,400), Hispanic or Latino families $11,200) and other families ($13,500). The gap between families widens significantly as time passes. For

families over the age of 55, the median net worth for Black or African American families is $53,800 compared to white families ($315,000), Hispanic or Latino families $111,500) and all other families ($213,200). Inheritances and other family support: The amount of financial support individuals of different races receive from parents and other family members. This support includes gifts, parents' investment in their children's education and other investments that can directly increase the next generation's wealth. Almost 30% of white families reported receiving an inheritance or gifts compared to 10% of Black or African American families, 7% of Hispanic or Latino families, and 18% of all other families.

- Homeownership: For many families, one of their biggest assets is their home. In this section, the authors outline the disparity in home ownership between races during a person's life cycle. A higher percentage of white families own a home across their lives compared to other families. For families aged less than 35, 46% of white families own a home compared to 17% for Black or African American families, 28% for Hispanic or Latino families, and 29% for all other families. These gaps do not close significantly across time. For families aged greater than 55, 84% of white families own a home compared to 57% for Black or African American families, 61% for Hispanic or Latino families and 64% for all other families.

  Home values also show significant differences based on race. The value of the home of the typical white family stands at $230,000 compared to $150,000 for Black or African American families, $200,000 for Hispanic or Latino families and $310,000 for all other families.

- Retirement accounts and plan participation: This section discusses the rates of retirement account ownership between races, noting that 65 % of white families have at least one retirement account. Among Black or African American families, that total is 44 %. A total of 28 % of Hispanic or Latino families have at least one of the accounts. Also, white families tend to participate in employer-sponsored retirement plans more than other families do.

- Emergency Savings: The SCF also tracks the emergency savings, which the survey defines as highly liquid, easily accessible funds to deal with unexpected events. The typical Black or African American, Hispanic or Latino, or other family has considerably fewer liquid savings than the typical white family, the report states. Typical Black or African American or Hispanic or Latino families have $2,000 or less in liquid savings. The typical white family's liquid savings is more than $8,000, while other families possess $5,000 in liquid savings.

  In addition to tracking highly liquid assets, the SCF also tracks equities as defined in the survey as indirectly and directly held stocks and mutual funds as well as semi-liquid accounts (such as retirement accounts) that are available to be sold or borrowed against in the event of an emergency. White families' equities total $50,600, the typical Black or African American family has $14,400. The typical Hispanic or Latino family: $14,900.

William Darity Jr.,Fenaba R. Addo,Imari Z. Smith. "A subaltern middle class: The case of the missing "Black bourgeoisie" in America." Paper presented at the 2019 Federal Reserve Community Development Conference, "Renewing the Promise of the Middle Class," First published: 04 May 2020, https://socialequity.duke.edu/wp-content/uploads/2020/05/DarityAddoSmithCEP2020.pdf

The authors conclude that "in U.S. society the concept of the middle class and all its associated characteristics is a White-centered narrative. To be middle class within the Black or African American wealth distribution is to be wealth poor based on U.S. wealth distribution standards." This article contains information similar to the information found in Disparities in Wealth by Race and Ethnicity in the 2019 Survey of Consumer Finances.

This article addresses what the authors view as "ten commonly held myths about the racial wealth gap in the United States":

1. "Greater educational attainment or more effort on the part of Blacks or African Americans will close the racial wealth gap."

   The authors write that, "On average, a Black or African American household with a college-educated head has less wealth than a white family whose head did not even obtain a high school diploma." They also note that unequal levels of wealth exist between Blacks or African Americans and whites with similar employment statuses.

2. "The racial homeownership gap is the "driver" of the racial wealth gap."

   The issue here, the authors state, is that wealth leads to homeownership but homeownership doesn't lead to wealth.

3. "Buying and banking Black or African American will close the racial wealth gap."

   Black or African American banks and businesses tend to be smaller and less profitable than white-owned banks and businesses, Darity et al. state, in part because those institutions are located in less economically robust areas and lack access to start-up and developmental finance, the authors state.

4. "Black or African American people saving more will close the racial wealth gap."

   Economists have found that Blacks or African Americans already save at a slightly higher rate than whites, although Blacks or African Americans participate in saving programs (i.e., 401(k)) at a lower rate than whites.

5. "Greater financial literacy will close the racial wealth gap."

   "Greater financial literacy can be valuable if an individual or household has finances to manage," the authors write "Financial literacy without finance is meaningless. There is no magical way to transform no wealth into great wealth simply by learning more about how to manage one's monetary resources."

6. "Entrepreneurship will close the racial wealth gap."

   To start a business and make it successful, the business needs access to capital, something Black or African American entrepreneurs lack. Research in 2010 by the Minority Business Development Agency found that Black- or African American-owned businesses started with $35,205 in capital. White business owners started theirs with an average of $106,702.

7. "Emulating successful minorities will close the racial wealth gap."

   The authors note that "successful" immigrant groups experience a class position comparable to that which they had in their country of origin. "Their own disparate levels of access to start-up and developmental finance, pre-migration capital, whether embodied in their education and training or their financial resources, is critical in determining their outcomes in the United States," the report states.

8. "Improved 'soft skills' and 'personal responsibility' will close the racial wealth gap."

   If, as this myth professes, Blacks or African Americans must learn and apply "soft skills" to close the wealth gap, the authors ask, why are Blacks or African Americans and Hispanics or Latinos crowded in lower-wage jobs that require interpersonal contact--even when educational attainment is accounted for—and underrepresented in higher-paying occupations that don't require those soft skills?

9. "The growing numbers of Black or African American celebrities prove the racial wealth gap is closing."

   In truth, the authors state, these Black or African American celebrities are extreme outliers and hide the fact that the median Black or African American family net worth is about $17,600.

10. "Black or African American family disorganization is a cause of the racial wealth gap."

    Darity et al note that single white mothers still have considerably more wealth than Black or African American mothers.

2.2 INSURANCE

Michael Gropper, Camelia M. Kuhnen. "Wealth and Insurance Choices: Evidence from U.S Households." Kenan Institute of Private Enterprise Research Paper No. 2021-05, 57 pages, July 19, 2021, https://kenaninstitute.unc.edu/wp-content/uploads/2021/07/gropper_kuhnen.pdf

The researchers hypothesize that, in theory, wealthier people should self-insure financial and property risk through savings and that insurance coverage should be negatively correlated with wealth. The researchers find the opposite is true: that financial wealth correlates to increased term life insurance and property insurance coverage. The research is based on administrative data for 63,000 individual customers from a financial services firm offering insurance and banking services. The data is from September 2015 to March 2019 and covers 2,500,000 observations. For each person, the data contained zip code, homeownership status, sex, age, marital status and whether children were in the household; the data did not contain information on race or ethnicity. The income distribution of individuals in the data was generally comparable to the income distribution in the 2016 Survey of Consumer Finances. However, the individuals in the sample studied were more likely to be married, homeowners and parents than the respondents to the 2016 Survey of Consumer Finances.

The researchers concluded that the impact of background risk, legal risk, liquidity constraints, financial literacy and pricing only partially explained the results that financial wealth correlates to increased term life insurance and property insurance coverage and that additional research is necessary.

The paper notes that a high prevalence of insurance exists. One in two households have life insurance, and the vast majority of households have property insurance (including homeowners and auto.) Specifically, 95% of homeowners have homeowners insurance. As a result, the researchers focus on coverage level rather than whether an individual has insurance.

Gropper and Kuhnen found that premiums per dollar of insurance coverage was positively correlated with wealth. They observed some states have less favorable legal environments than others and that the wealthy may be at greater risk of a lawsuit. The researchers found that property insurance coverage positively correlated with a more litigious environment.

The researchers also found that age is positively correlated with insurance coverage.

2.2.1 LIFE INSURANCE

Researchers focused on term life insurance because most of the life insurance policies in their data were term life insurance. In addition, the researchers note that whole life insurance can be an investment vehicle in addition to an insurance vehicle.

Using an ordinary least squares model, researchers found that life insurance coverage correlates with the following:

1. Household wealth. An increase in household wealth of $100,000 increases the likelihood of the household having life insurance by 12%.
2. The expected future spending of dependents. For example, expecting to pay off a mortgage is associated with higher life insurance coverage than dependents who do not have mortgages.
3. Home value. An increase of $100,000 in home value increases the likelihood of the household having life insurance by a little under a percentage point.
4. Age increases the likelihood that someone has life insurance, although the average coverage level decreases with age.
5. Risk aversion is also correlated with higher life insurance coverage.

2.2.2 PROPERTY INSURANCE

Mortgage companies require homeowners to have homeowners insurance, which prompted researchers to study the level of coverage instead of whether an individual had coverage. The researchers found that higher financial wealth and higher housing wealth positively correlated with a higher percent of the home value being covered by insurance.

Researchers divided states into higher risk legal environments and lower risk legal environments. They found that wealthy households bought higher levels of insurance coverage in high-risk legal states compared to lower risk legal states, which suggests that wealthier individuals purchase higher levels of coverage due to legal risk.

2.2.3 EDUCATION

Researchers found that individuals with a college degree or higher had higher levels of life insurance and personal property insurance coverage. However, the researchers note that education positively correlates with income and may be a proxy for expected future earnings.

2.2.4 COSTS

Researchers found that wealthier people pay higher prices for term life insurance. However, the researchers were unable to see policy term length in their data, leaving open the possibility that the wealthy are buying longer coverage terms, which could appear as paying higher prices.

2.3 RETIREMENT

Greenwald Research. Study of financial perspectives across five generations, follow-up survey, and reports on race and ethnicity and financial fragility, Society of Actuaries, 2021, https://www.soa.org/resources/research-reports/2021/generations-survey/

This study, as part of the Society of Actuaries' Aging and Retirement Strategic Research Program, focuses on the financial priorities and strategies of Americans across the generations. The article also draws attention to how each of the generations thinks about climate change affecting their savings, with millennials being the most concerned.

Financial Perspectives on Aging and Retirement Across the Generations

The article draws attention to the impact of COVID-19 on people of different generations. In total, 40% of Millennials, 33% of Gen Xers and 21% of Early Boomers experienced some job loss or pay decrease. However, 11% of Millennials had an increase in income and 43% experienced no impact. The study also shows that almost 4 out of 10 people have reduced spending after COVID-19 even though they did not endure a negative impact from the pandemic.

The study emphasizes the huge variation in saving and financial planning across different generations. The data tells us that only 37% of the Millennials plan for a year ahead compared to 70% in Late Boomers.

The study also analyzed data on retirement and preparedness for retirement among different generations and noted that approximately two-third of the Early Boomers thought they were ready for retirement and well prepared. About 6 of 10 of the younger generations feel that they are ready for retirement. However, a quarter of them disagree and worry about their retired life.

The study also focuses on mortgage and house rent payments and highlights that almost 10% of the Millennials and 7% of the Gen X had admitted that they faced trouble making rent and mortgage payments after the start of the COVID-19 pandemic. In total, a third of the Millennials and 19% of Gen X made changes to their living arrangements since the beginning of the pandemic.

Exploring Financial Fragility Across Generations, Race and Ethnicity

This study defines financial fragility as "vulnerability to a financial crisis and having a negative outlook of personal finances, which can play a significant role in an individual's financial planning, priorities, and retirement concerns." The study tells us that about 3 of 10 Millennials and Gen Xers are financially fragile. As the age increased, the proportion of highly fragile individuals significantly decreased. The study found that those with high fragility are less focused on long-term planning. They are more likely to live paycheck to paycheck – 55% compared to 20% with moderate fragility and 3% with low fragility. In addition, a lower percent (47%) of high fragility individuals prioritizes saving for retirement compared with low fragility (64%).

The study also looks at race or ethnicity. Within the study, 16% of Asian or Asian American respondents, 20% of Blacks or African Americans, and 31% of Hispanic or Latino respondents were highly fragile. The study also found that female, single and unmarried respondents were more likely to be financially fragile. The study also lays down different points and strategies on how to be less fragile financially including:

1. Understanding and making smart use of debt.
2. Developing smart spending strategies and avoiding impulse purchases.
3. Understanding that as savings increase, it is important to shift from saving money to investing money.

Financial Perspectives on Aging and Retirement Across the Generations—Report on Race and Ethnicity

The report highlights key differences between priorities among different races and ethnicities on financial behavior. It states that financial priorities are slightly different among these groups. While Asian or Asian American respondents are more likely to say saving for retirement is their top financial priority, Black or African American and Hispanic or Latino respondents are more focused on being able to afford everyday bills and building up emergency funds.

The study refers to receiving financial support and outlines how different ethnicities place importance on financial support for their well-being. It reports that 25% of Hispanic or Latino, 22% of Black or African American, and 17% of Asian or Asian American respondents received financial support in the previous year. This financial support was received from parents and children.

Apart from support related to COVID-19, half of the Black or African American, 46% of Hispanic or Latino, and 25% of Asian or Asian Americans have received government support.

When asked if respondents were ready for their retirement, less than half of the Black or African American and Hispanic or Latino respondents said they think they are on track. The respondents also were asked whether they would be able to cover an unexpected expense of $10,000. Half of Asian or Asian Americans said they could cover that amount. A total of 37% of the Black or African American and 31% of the Hispanic or Latino respondents said they would be unable to cover such an unexpected expense.

The report found that "across all retirement risks, Hispanic or Latino respondents reported the highest levels of retirement-related concern, mostly worrying about having insufficient funds to pay for adequate healthcare, not being able to manage their finances, and related issues." Concerns about the effect of climate change are highest among Hispanic or Latino respondents (54%) compared to Black or African American (45%) and Asian or Asian American respondents (40%). The COVID-19 pandemic has prompted 3 in 10 Black or African Americans and almost 4 in 10 Asian or Asian American or Hispanic or Latino respondents to change or consider changing when they will retire.

Appendix D: Further Reading

1. Baradaran, Mehrsa. 2017. *Color of Money*.

2. Brown, Dorothy. 2023. *Whiteness of Wealth*.

3. Rothstein, Richard. 2017. *Color of Law*.

4. Katznelson, Ira. 2006. *When Affirmative Action Was White*.

5. Perry, Andre. 2020. *Know Your Price*.

About The Society of Actuaries Research Institute

Serving as the research arm of the Society of Actuaries (SOA), the SOA Research Institute provides objective, data-driven research bringing together tried and true practices and future-focused approaches to address societal challenges and your business needs. The Institute provides trusted knowledge, extensive experience and new technologies to help effectively identify, predict and manage risks.

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