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Modeling Behavioral and Attitudinal Drivers of Life Insurance Selection and Premiums

Polynomial Approaches to Perceived Affordability in Term and Cash Value Products

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Abstract

Background: Life insurance markets are experiencing unprecedented transformation in the wake of economic disruption, evolving consumer expectations, and behavioral shifts following the COVID-19 pandemic. Traditional economic models often fail to capture the complex interplay of attitudinal, and cognitive factors that now shape insurance demand and premium selection.

Methods: This study analyzes nationally representative survey data from over 3,600 U.S. adults (2024 NAIC Financial Inclusion Survey), employing a weighted two-step Heckman selection model to disentangle the determinants of both life insurance uptake and premium outcomes. The primary innovation is modeling "psychological price"—a composite measure of perceived affordability—using higher-order polynomials, while also integrating psychometrically robust measures of financial knowledge and risk tolerance. Political ideology, race/ethnicity, and sources of financial advice are included as theoretically justified exclusion restrictions.

Results: The results reveal strong, nonlinear effects of psychological price on insurance uptake and premium selection, with term insurance showing a distinct "sweet spot" at moderate affordability, and diminishing returns at both affordability extremes. In contrast, cash value insurance displays a more monotonic decline in premiums as perceived affordability increases. Financial knowledge and risk tolerance significantly predict term insurance uptake and premium choice but have weaker or negative effects on cash value premiums. Political ideology and race further differentiate patterns of product selection, highlighting persistent disparities and the role of sociopolitical factors in insurance engagement.

Conclusion: Nonlinear attitudinal and cognitive factors play a central role in life insurance decisions, often overriding traditional demographic and economic predictors. Modeling psychological price as a polynomial captures threshold effects and behavioral nuances missed by linear models. These findings offer actionable insights for insurers, policymakers, and educators seeking to design more effective, inclusive, and behaviorally informed insurance products and interventions.

Keywords: Life Insurance, Term policy, Cash Value, Psychological price, Financial Literacy, Risk Tolerance, Heckman

1 Introduction

Life insurance is fundamental to contemporary financial management and economic growth, offering essential protection for families and serving as a crucial tool for generating long-term capital in national economies. The global business environment is rapidly changing, characterized by heightened volatility, technology advancements, and evolving macroeconomic frameworks, hence intensifying the necessity for efficient risk management systems. Life insurance, in its various forms, aids households in mitigating the financial consequences of mortality risk while also contributing to overall financial stability and economic growth. The dual function of life insurance as both a private asset and a public stabilizer highlights the necessity for academics, practitioners, and policymakers to comprehend the factors influencing its demand (Dragoş, Mare, and Dragoş, 2019; Zietz, 2003).

Although fundamental, the factors influencing life insurance adoption and coverage decisions are becoming increasingly intricate and context-specific, undermining the effectiveness of conventional actuarial and economic models. Consumer demand is influenced by a combination of factors: rational expectations concerning risk and return, current macroeconomic conditions, and various behavioral influences, including psychological perceptions of affordability, financial literacy, and cognitive biases (Tversky and Kahneman, 1992; Kunreuther, Pauly, et al., 2006; Rabin and Thaler, 2001). Recent research underscores how deficiencies in financial literacy, prevailing social norms, and marketing tactics influence not only individuals' choices between term and cash value policies but also the premiums they are prepared to pay and the extent of coverage they opt for (Lusardi and Mitchell, 2014; Lusardi and Tufano, 2017; Zhang, 2024). In a time of increased uncertainty and changing financial systems, innovative interdisciplinary strategies are essential to understand the interaction between economic rationality and behavioral realities, allowing insurers and policymakers to create products and interventions that overcome both financial and psychological obstacles to optimal insurance participation.

The U.S. life insurance market has experienced rapid upheaval in recent years, influenced by unprecedented economic volatility, evolving consumer preferences, and the lasting consequences of the COVID-19 epidemic. Millennials and Generation Z have a pronounced interest in financial protection, characterized by an increased awareness of mortality risks and a desire for enhanced economic security (Dhanya, Anusree, and Varier, 2023;

Bhatia, Bhat, and Tikoria, 2021; Bernheim, 1991). Surveys indicate that around fifty percent of Gen Z acknowledges the significance of coverage, with considerable numbers planning to acquire life insurance shortly (Kohn, 2023; Life Happens, 2023). This changing demand landscape is accompanied by increasing complexity: consumers face a variety of product options, new distribution channels, and an information-dense environment that necessitates more advanced decision-making. In this environment, conventional insurance demand models—primarily based on economic rationality—are increasingly augmented with insights from behavioral economics, psychology, and finance, illustrating the diverse influences on risk management and insurance engagement.

Although a substantial body of work exists on life insurance demand, significant gaps remain about the psychological and behavioral factors influencing product adoption, premium payment, and policy choice. Previous studies have examined various predictors—including wealth, family structure, education, and subjective risk aversion—yielding inconsistent results regarding their predictive efficacy and significance across diverse populations and timeframes (Anderson and Nevin, 1975; Browne and Kim, 1993; Mantis and Farmer, 1968; Zietz, 2003; Poterba, Venti, and Wise, 2013; Ropponen, Kuusi, and Valkonen, 2023). There is increasing evidence that attitudinal factors—such as perceived affordability ("psychological price"), risk tolerance, and financial literacy—significantly and occasionally nonlinearly influence insurance behavior (Kunreuther, Pauly, et al., 2006; Outreville, 2013). Although price sensitivity and affordability have traditionally been acknowledged as pivotal to insurance participation, recent research indicates that the correlation between perceived price and demand may be notably non-monotonic, necessitating more sophisticated modeling techniques to accurately represent the comprehensive range of behavioral responses (Simonsohn, 2018).

This study addresses important gaps in the insurance literature by analyzing a unique, nationally representative dataset collected by the National Association of Insurance Commissioners in early 2024, focusing on the shifting landscape of life insurance demand in the U.S. during the post-pandemic period. The principal methodological innovation lies in the application of higher-order polynomial modeling to psychological price—an attitudinal construct that reflects perceived affordability of life insurance products—to capture both linear and nonlinear (U-shaped) effects on insurance uptake and premium selection (Kahneman and Tversky, 1979). This analytic approach is motivated by theoretical advances in behavioral economics: specifically, prospect theory and mental accounting. Prospect theory posits that individuals assess risky choices not only by expected value but also by reference-dependent perceptions of gain and loss, frequently overweighting low-probability outcomes and responding nonlinearly to changes in affordability (Kahneman and Tversky, 1979; Stapleton, 2021; Kahneman and Tversky, 1979). Mental accounting, meanwhile, suggests that consumers often treat insurance premiums as a separate budget category, evaluating affordability based on psychological thresholds rather than strict actuarial cost-benefit analysis (Thaler, 1985). By integrating these insights, the study not only models affordability as a higher-order polynomial but also incorporates contemporary, psychometrically sound measures of financial knowledge (via item response theory) and risk tolerance (via combined stated and revealed preferences). Together, these constructs provide a multidimensional, behaviorally rich assessment of the drivers of life insurance decisions.

How do attitudinal and cognitive variables—especially the nonlinear effects of psychological price—influence the likelihood of life insurance uptake and the selection of premiums for term and cash value products among U.S. adults, after controlling for financial knowledge, risk tolerance, and other relevant factors? Consistent with prospect theory and the literature on attitudinal pricing, several hypotheses are advanced. First, the linear (first-order) component of psychological price is expected to be positively related to both uptake and premium paid for term insurance, while the quadratic (second-order) and cubic (third-order) components are hypothesized to be negative, supporting the idea that increases in perceived affordability initially boost demand but eventually reach a point of diminishing returns or even reversal (a behavioral “sweet spot” consistent with reference dependence and mental accounting thresholds). For cash value insurance, the first-order psychological price effect is expected to be significant for uptake but, due to greater price sensitivity and the higher entry cost, only the linear term is hypothesized to significantly predict premium choice. These relationships are anticipated to differ between term and cash value products, reflecting the distinct behavioral and psychological mechanisms—rooted in prospect theory and mental accounting—that shape how consumers evaluate affordability, risk, and product value. By rigorously modeling these interactions, this research delivers new evidence on the behavioral economics of insurance, with direct implications for policy, financial education, and insurance product design.

This research is intentionally scoped to illuminate the nuanced impact of attitudinal and psychological factors on U.S. life insurance demand in the post-pandemic era, moving beyond conventional analyses that rely primarily on demographic or purely economic predictors. Central to the analysis is the construct of psychological price, modeled as a higher-order polynomial to capture potential nonlinear and non-monotonic effects on both insurance uptake and premium choice—reflecting contemporary advances in behavioral economics and attitudinal modeling. In addition to psychological price, the study rigorously incorporates objective measures of financial knowledge (using item response theory) and risk tolerance (using composite indices grounded in

expected utility theory), thereby providing a multidimensional perspective on how individual capability and preferences drive insurance decisions. The research framework is further strengthened by the inclusion of political ideology as a key exclusion restriction in the selection equation. Political ideology is increasingly recognized as a determinant of economic behavior, particularly in the U.S. context, where it shapes trust in financial institutions, perceptions of risk, and long-term planning horizons—factors that are especially salient in post-pandemic consumer attitudes toward insurance and financial protection (Jost, Federico, and Napier, 2009; Crockett and Wallendorf, 2004; Key and Donovan, 2017).

To achieve robust causal inference and address potential selection bias in insurance adoption, the study employs a weighted two-step Heckman selection model, which explicitly separates the determinants of insurance uptake (selection) from those of premium and coverage choices (outcome), while ensuring national representativeness through analytic weights. This econometric approach is critical in insurance research, as non-random selection into coverage—driven by unobserved risk preferences, trust, or access barriers—can bias estimates if uncorrected (Heckman, 1979; Bernard, Selden, and Fang, 2023). The model leverages variables such as political ideology, source of financial advice (e.g., reliance on a professional advisor or insurance agent), and race/ethnicity as theoretically justified exclusion restrictions in the uptake equation. Political ideology is increasingly recognized for its role in shaping preferences for risk sharing, trust in institutions, and long-term financial planning; professional advisors influence information access and decision quality; and race/ethnicity shapes social capital and exposure to insurance markets (Das, Sarkar, and Debroy, 2022). By incorporating these variables as exclusion restrictions, the weighted Heckman approach achieves proper model identification and enhances the credibility of inferences regarding the effects of attitudinal variables on insurance decisions. This design enables a more precise disentanglement of how subjective beliefs, trust, and access to professional guidance shape both the probability of life insurance uptake and the magnitude of financial commitment, providing actionable insights for insurers, regulators, and policymakers seeking to design more equitable and resilient financial protection systems in a rapidly evolving economic landscape.

2 Methodology

2.1 Data Source and Sample Design

The research analyzes the demand for life insurance and the factors influencing premium choices. It utilizes data from the 2024 Financial Inclusion Survey conducted by the Center of Insurance Policy and Research (CIPR) under the National Association of Insurance Commissioners (NAIC). The survey was administered from February to March 2024 using the Qualtrics online platform, collecting responses from 3,611 people across the United States. Prestratification weights were employed throughout the survey execution to ensure adequate representation of minority groups, leading to the oversampling of certain populations. This strategy aligns with research demonstrating that oversampling enhances the accuracy of estimates for underrepresented groups and mitigates bias (Groves, 2006; Kalton, 2009). Post-stratification weights were applied using the ANESRAKE approach to achieve national representativeness. This statistical method adjusts sample weights to conform to predetermined population totals, correcting sampling bias and improving overall data representativeness (Pasek and Pasek, 2018; DeBell and Krosnick, 2009; Battaglia, Hoaglin, and Frankel, 2009; Kolenikov, 2014; Ansolabehere and Rivers, 2013). The survey was modified using parameters such as age, education level, race, income level, gender, and region, informed by the most recent 2024 U.S. Census Bureau data. The survey covered various topics related to financial inclusion, including health insurance, life insurance, retirement planning, financial literacy, and risk perception. It also collected extensive demographic data to facilitate a detailed examination of financial behaviors and attitudes across different population groups.

2.2 Main variables

2.2.1 Dependent Variables

The study examines two primary dependent variables to assess life insurance demand and the factors affecting premium selection. The primary dependent variable is a binary indicator reflecting the existence or non-existence of life insurance coverage among respondents. This variable serves as a reliable indicator of insurance ownership, reflecting individuals' participation in the life insurance market and highlighting the accessibility and appeal of these risk management solutions. The second dependent variable is the actual premium paid by policyholders, generally reported as a continuous monetary value. This variable is crucial for comprehending the economic trade-offs consumers encounter and the financial implications of life insurance participation. The analysis categorizes customer behavior variance by two prevalent forms of life insurance: term life insurance and cash value life insurance, encompassing whole life and universal life policies. Term life insurance offers provisional

coverage for a specified duration—such as 10, 20, or 30 years—at comparatively modest premiums. It possesses neither a savings nor an investment element, and coverage terminates at the end of the term unless renewed (Outreville, 2013; Mulholland, Finke, and Huston, 2016; Heo, Lee, and Park, 2021; Nkouaga, 2024a). In contrast, cash value life insurance provides continuous coverage and incorporates a savings or investment component that accrues tax-deferred cash value over time. This insurance type, albeit pricier, is frequently selected for its dual functions of providing a death benefit and facilitating wealth creation (Babbel and Merrill, 1998; Cole and Fier, 2021; Rabbani, 2020; Nkouaga, 2024a). The economic differentiation between these two policy kinds is essential: term insurance is largely regarded as risk protection, whereas cash value insurance additionally functions as a hybrid financial asset. The study facilitates a detailed assessment of how demographic, economic, and behavioral factors variably influence insurance ownership, premium selections, and coverage levels across different product categories by disaggregating the data in this manner. This dual-framework methodology offers an extensive viewpoint on life insurance demand among various consumer subgroups.

2.2.2 Independent Variables

Main variable The main independent variable, "psychological price," is formulated as a composite metric that captures each respondent's attitudinal perception of the affordability of life insurance. The survey instrument employed skip logic to customize affordability inquiries according to insurance status: respondents lacking current life insurance were questioned regarding the perceived affordability of life insurance for themselves and their families, whereas those with life insurance reported on the affordability of their existing premiums. Each was evaluated on a six-point ordinal scale, extending from "very unaffordable" to "very affordable," with an additional category for "no contribution required." The responses were transformed into numerical values and amalgamated into a singular continuous scale that reflects perceived affordability among both insured and uninsured groups. This integrated metric guarantees comparability, prevents flawless prediction in insurance adoption models, and offers a thorough proxy for the psychological cost—characterized in behavioral economics and consumer psychology as the subjective perception of sacrifice or limitation linked to acquiring or retaining insurance (Thaler, 1985; Hsee and Kunreuther, 2000; Ali and Anwar, 2021; Alemán and Marrugo, 2023).

Due to the recognized nonlinearity of attitudinal influences on financial decision-making, psychological pricing is incorporated into the regression models utilizing a third-degree (cubic) orthogonal polynomial function. Employing polynomials for attitudinal and perceptual variables is highly advocated in economic, psychological, and financial literature, as it facilitates the detection of non-monotonic, threshold, and "kinked" relationships that linear models may overlook (Edwards and Parry, 1993; Homburg, Koschate, and Hoyer, 2005; Simonsohn, 2018). This method provides a flexible and rigorous framework for modeling how changes in perceived affordability—at various locations on the psychological price spectrum—can have diverse and perhaps paradoxical effects on insurance enrollment and premium choice.

Consumer characteristics This research accounts for alternative explanatory variables, such as cognitive measures. The cognitive measures are financial knowledge and risk tolerance. The evaluation of financial knowledge utilized a psychometrically sound methodology based on contemporary measurement theory. This study defines financial knowledge as an individual's capacity to comprehend, assess, and utilize fundamental financial concepts, including interest compounding, inflation, risk diversification, and the attributes of financial instruments such as stocks, bonds, and savings accounts (Lusardi and Mitchell, 2014; Delgadillo and Lee, 2021; Gladstone and Barrett, 2023; Nkouaga, 2024a; Nkouaga, 2024b). Participants were given a set of six objective questions that have been extensively validated in global financial literacy assessments. Responses were classified as accurate or incorrect, and these binary results were examined using a two-parameter logistic (2PL) item response theory (IRT) model. The 2PL model assesses item discrimination (the effectiveness of an item in distinguishing between respondents with varying ability levels) and item difficulty (the challenge presented by an item), thus addressing discrepancies in item quality and respondent ability in measuring financial knowledge (Lin et al., 2017; Awopeju, Afolabi, and Opesemowo, 2017; Stenhaug and Domingue, 2022).

To generate a continuous, individualized financial knowledge score, the study used the expected a posteriori (EAP) method—a Bayesian empirical estimator that computes the expected value of a respondent's latent trait (ability) given their pattern of responses and the estimated item parameters. EAP scores utilize all accessible information and exhibit reduced bias compared to conventional sum scores, particularly when items differ in difficulty or discrimination (Embretson and Reise, 2013). Subsequent to computation, the EAP scores were linearly adjusted to ensure all values were unequivocally positive, hence enhancing their interpretability and applicability in regression models.

The financial knowledge variable is constructed as a latent trait (θ) using a two-parameter logistic (2PL) item response theory (IRT) model and estimated for each respondent via the expected a posteriori (EAP) method. The process proceeds as follows:

1. **Binary Scoring of Items:** For each respondent i and question j ($j = 1, \ldots, J$), define the binary response

$$x_{ij} = \begin{cases} 1, & \text{if the response to item } j \text{ is correct} \\ 0, & \text{otherwise} \end{cases}$$

2. **2PL IRT Model:** Each item j is characterized by a discrimination parameter a_j and a difficulty parameter b_j. The probability of a correct response, given latent trait θ_i, is

$$P(x_{ij} = 1 \mid \theta_i) = \frac{1}{1 + \exp\left[-a_j(\theta_i - b_j)\right]}$$

3. **Likelihood Function:** The joint likelihood of respondent i's response vector $\mathbf{x}_i = (x_{i1}, \ldots, x_{iJ})$ is

$$L(\theta_i \mid \mathbf{x}_i) = \prod_{j=1}^{J} P(x_{ij} \mid \theta_i)^{x_{ij}} \left[1 - P(x_{ij} \mid \theta_i)\right]^{1 - x_{ij}}$$

4. **Expected a Posteriori (EAP) Estimation:** The EAP estimate of θ_i is given by

$$\hat{\theta}_i^{\text{EAP}} = \frac{\int \theta \, L(\theta \mid \mathbf{x}_i) \, p(\theta) \, d\theta}{\int L(\theta \mid \mathbf{x}_i) \, p(\theta) \, d\theta}$$

   where $p(\theta)$ is the assumed prior (typically standard normal).

5. **Rescaling:** To ensure all values are positive (e.g., for modeling purposes), a linear shift is applied:

$$\hat{\theta}_i^{\text{EAP,pos}} = \hat{\theta}_i^{\text{EAP}} - \min_i \left(\hat{\theta}_i^{\text{EAP}}\right) + \epsilon$$

   where ϵ is a small positive constant (e.g., 0.01) to ensure strictly positive values.

Risk tolerance—a central concept in expected utility theory—refers to an individual's willingness to accept uncertainty in exchange for potential gains, shaping their choices regarding insurance, investments, and risky financial behaviors. In this study, risk tolerance is operationalized as a composite, bounded index synthesizing both stated and revealed preferences. First, respondents report the maximum amount they would pay to enter a lottery offering a 10% chance to win \$1,000. This certainty equivalent (CE) represents the point of indifference between a sure payment and a risky prospect; higher values indicate greater tolerance for risk. The CE is capped at the lottery's expected value (\$100) to reflect that willingness to pay beyond this point signals risk neutrality or risk-seeking behavior, consistent with classic expected utility theory (Von Neumann and Morgenstern, 2007). Second, monthly self-reported lottery expenditure is recorded in ordinal categories and mapped to dollar midpoints, then normalized to a [0,1] scale. The final risk-tolerance index is the mean of the normalized certainty equivalent and spending fraction. This hybrid measure captures both an individual's direct evaluation of risk and their actual behavior in risky markets, producing a continuous, interpretable, and psychometrically robust index suitable for regression modeling (Barsky et al., 1997; Dohmen et al., 2011; Bruhin, Fehr-Duda, and Epper, 2010). Because the distribution of this index is highly skewed, a natural-log transformation is applied for statistical analyses.

Let X_i be respondent i's maximum stated willingness to pay for a 10% chance at \$1,000 (certainty equivalent).

$$\begin{aligned} \text{EV} &= 0.10 \times 1000 = \$100 \\ \text{CE}_i &= \min\{X_i, 100\} \\ \text{CE\_frac}_i &= \frac{\text{CE}_i}{\text{EV}} \end{aligned}$$

Let s_i denote respondent i's typical monthly lottery spending, mapped from the ordinal response:

$$s_i \in \{0, 2.5, 10.5, 23, 40.5, 75\}$$

The normalized spending fraction:

$$\text{spend\_frac}_i = \frac{s_i}{75}$$

The composite objective risk tolerance index is then:

$$\text{riskTol}_i = \frac{\text{CE\_frac}_i + \text{spend\_frac}_i}{2}$$

Finally, a log transformation is applied for regression analyses to address skewness:

$$\text{logRiskTol}_i = \log(\text{riskTol}_i + 0.01)$$

To further strengthen the validity of the empirical research and address any confounding factors, multiple control variables are incorporated into the study, each substantiated by existing literature. The number of dependents, ranging from none to over five, serves as a vital control, as the existence of dependents heightens the necessity for life insurance to ensure financial security for family members upon the policyholder's demise; empirical research consistently demonstrates a positive correlation between the number of dependents and the demand for life insurance (Gropper and Kuhnen, 2025; Lewis, 1989). The level of education is also accounted for, as elevated educational attainment correlates with enhanced financial literacy, awareness of insurance products, and an increased likelihood of obtaining life insurance (Giri, 2018; Lusardi and Mitchell, 2014; Nkouaga, 2024a). A dummy variable for residing in a rural area is incorporated, as rural households frequently encounter distinct economic risks, access barriers, and financial inclusion challenges relative to urban households, influencing both the probability and nature of life insurance acquired (Giri, 2018).

Underwriting factors Underwriting factors denote the characteristics that insurance firms commonly utilize to evaluate risk and establish the pricing and conditions of life insurance contracts. These characteristics are used as essential controls in the empirical study to address their direct impact on both premium levels and coverage selections. Age is treated as a continuous variable for all respondents aged 18 and older, illustrating the proven correlation between advancing age and elevated mortality risk, which therefore results in increased premiums (Brown and Goolsbee, 2002; Outreville, 2013). Gender is denoted by a binary variable, with females assigned a value of 1, reflecting actuarial data indicating that women often exhibit lower death rates and may consequently benefit from more advantageous pricing (Brown and Goolsbee, 2002). Employment status is incorporated as a dummy variable (employed = 1), given that stable employment correlates with reduced risk and enhanced capacity to pay premiums. Income level is assessed using a nine-point ordinal scale, spanning from below $15,000 to above $500,000, reflecting the positive correlation between income and both the probability of acquiring life insurance and the extent of coverage secured (Outreville, 2013). Perceived physical health, rated from 1 (poor) to 5 (great), acts as an indicator of tobacco consumption and underlying medical issues, both of which are essential factors influencing insurability and premium rates in actuarial practice. Marital status is represented as a binary variable (married = 1), indicating that married persons are more inclined to acquire life insurance for the financial stability of their dependents (Lin and Grace, 2007). The policy's face value is incorporated as a control, as elevated coverage quantities generally correlate with increased premiums and may indicate variations in risk selection and financial planning requirements.

Exclusion Restriction An *exclusion restriction* is a variable that influences the likelihood of inclusion in the sample but does not directly impact the outcome of interest, hence appearing solely in the selection equation of a Heckman model. This study utilizes three restrictions: political ideology (binary indicators for liberal, centrist, and conservative, with "no ideology" as the comparison group), race (Asian, Black people, Latino, Native American with White people as the comparison group), and source of financial advice (professional advisor, with personal network and book and Internet search as the reference). Each is derived from self-reported survey items and is only used in the probit model for the decision to acquire life insurance, reflecting attitudes toward risk, belief systems, and trust in expert counsel. By altering selection probabilities without incorporating the premium or coverage result equation, these instruments ascertain the Inverse Mills Ratio and guarantee consistent estimate of the conditional outcome parameters (Puhani, 2000). A weighted analysis of the 2024 Financial Inclusion Survey suggests that political ideology shapes both ownership rates and perceived importance with conservatives showing the highest values (Figure 1), and that among the source of financial advice, personal network is the main source compared to professional advisor, or book & Internet research (Figure 2). Because these factors plausibly affect only the decision to enter the insurance market and not the actuarial determination of premiums or face values once a policy is in force, they satisfy the exclusion-restriction requirement in the Heckman sample-selection model and thus identify the selection correction without biasing the outcome estimates. Race serves as a strong and appropriate exclusion constraint for the selection equation (i.e., the decision to acquire life insurance) in the framework of U.S. life insurance regulation and empirical investigation. Historically, race significantly influenced the life insurance market in a discriminatory manner; however, current regulatory frameworks at both federal and state levels clearly forbid the use of race in deciding premiums or coverage amounts (Avraham, Logue, and Schwarcz, 2013; Lent et al., 2022; Gale et al., 2022). State insurance regulations, particularly those endorsed by entities like the National Association of Insurance Commissioners (NAIC), designate race as an unacceptable criterion for risk assessment, rendering its application in underwriting or pricing decisions either unlawful or heavily constrained (Center for Insurance Policy and Research

(CIPR), 2020). For example, states such as Colorado and Texas explicitly prohibit insurers from rejecting coverage, limiting coverage levels, or altering premium prices based on race. In states without specific legal bans, industry practices predominantly omit race from actuarial assessments (Colorado Division of Insurance, 2021; Code, 2023). Nevertheless, race continues to be a substantial determinant of life insurance ownership owing to deep-rooted social, economic, and historical disparities. Research consistently indicates that, when controlling for observable socioeconomic disparities, Black individuals (as confirmed in Figure 3) are generally more inclined to acquire life insurance compared to white individuals—a pattern shaped by differences in wealth, risk perceptions, trust in financial institutions, and family dynamics (Harris and Yelowitz, 2017; Kim, Gutter, and Hanna, 2020). The observed patterns are not influenced by contemporary discriminatory pricing practices, but instead signify deeper systemic and historical reasons. Empirical research demonstrates a lack of current evidence supporting race-based premium setting or coverage determination, particularly in jurisdictions with stringent enforcement of anti-discrimination laws(Gale et al., 2022). Consequently, incorporating race as an exclusion constraint in the selection equation efficiently encapsulates unobservable social and behavioral determinants of insurance demand while adhering to legal norms. The exclusion from the outcome equations (premium size or coverage quantity) is warranted by legislative restrictions and empirical data indicating the lack of racial discrimination in contemporary underwriting processes.

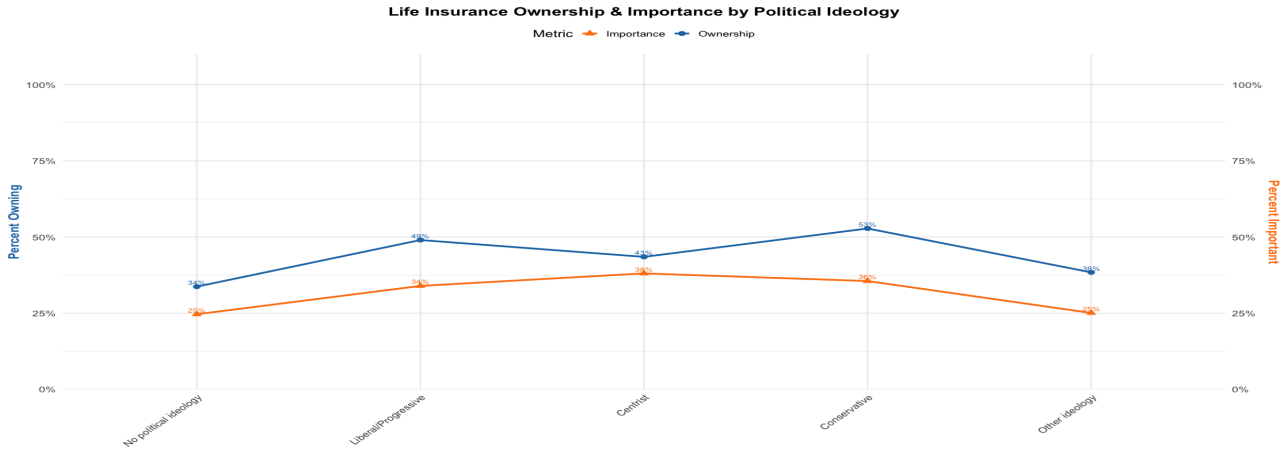

Figure 1: *Life Insurance ownership and importance by Political Ideology*
Source: Author's analysis of the 2024 FIS

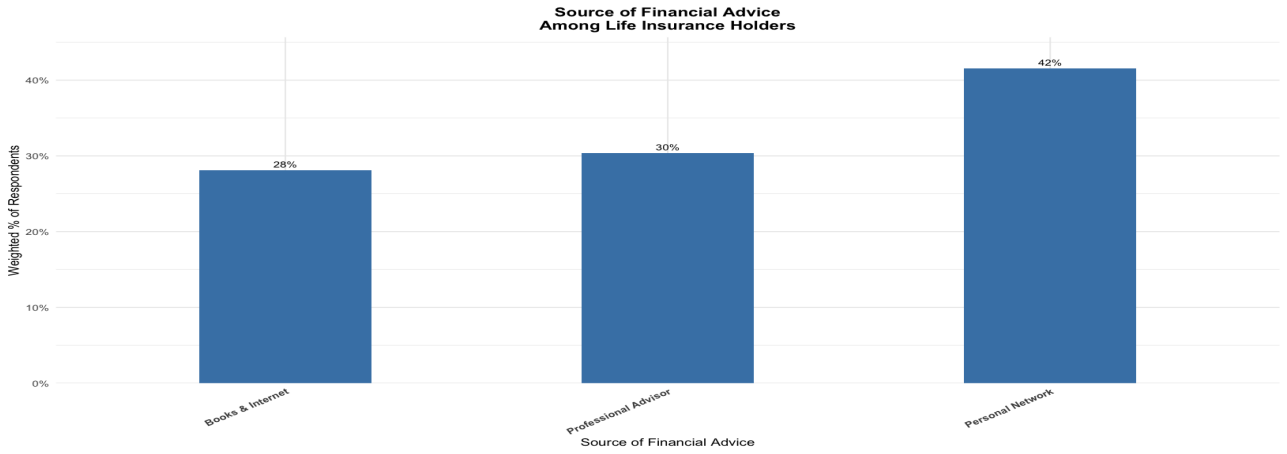

Figure 2: *Source of Financial Advice Among Life Insurance Holders*
Source: Author's analysis of the 2024 FIS

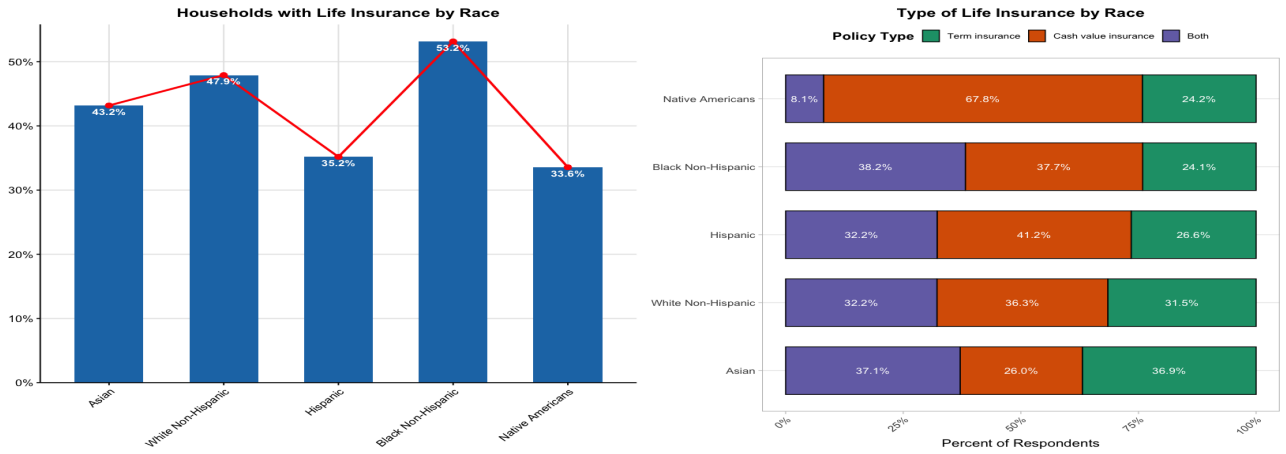

Figure 3: *Life Insurance ownership race*
Source: Author's analysis of the 2024 FIS

2.3 Econometric Model

The empirical strategy relies on Heckman (1979) two-stage (Tobit-2) sample-selection framework, estimated by full maximum likelihood. In the first stage a latent propensity to purchase life insurance is modeled by the probit selection equation

$$S_i^* = \mathbf{x}_i'\boldsymbol{\gamma} + u_i, \qquad S_i = 1\{S_i^* > 0\},$$

where $S_i = 1$ if individual i holds a policy and $S_i = 0$ otherwise. The vector $\mathbf{x}_i$ includes control variables (income, age, gender, marital status, number of dependents, employment status, rural residence, self-reported physical health), cognitive measures (objective financial knowledge and risk tolerance) and attitudinal variables (subjective financial knowledge and risk tolerance). Three exclusion-restriction variables—political ideology, race, and source of financial advice —enter only this selection equation. These instruments shift the likelihood of purchase by capturing attitudes toward risk, belief systems, and source in financial advice, but they plausibly have no direct actuarial nor psychological effect on the size of premiums or face values once insurance is purchased.

Conditional on $S_i = 1$, the second stage estimates the outcome equation

$$Y_i = \mathbf{w}_i'\boldsymbol{\beta} + \varepsilon_i,$$

where Y_i is either the premium paid or the face value chosen. Four separate specifications share the same selection covariates but differ in Y_i: term insurance premium, term face value, cash value insurance premium (cash_premium) and cash value coverage (face value). In each premium model the face value size enters as a right-hand-side regressor, while in each coverage model the corresponding premium paid appears. This reflects economic causality: willingness to pay depends on desired coverage, and chosen coverage depends on budget constraints.

All four outcome equations also include psychological price, retirement saving, education level and rural residence, alongside the underwriting factors, cognitive measures and attitudinal variables. These variables influence the magnitude of premiums and face values but are unlikely to affect the binary decision to purchase, and hence are omitted from the selection equation. By restricting premium and face-value measures to the outcome stage, the model respects the temporal ordering—purchase first, then choice of price and coverage.

Under the assumption that (u_i, ε_i) are jointly normal with $\mathrm{Corr}(u_i, \varepsilon_i) = \rho$, the expected outcome conditional on purchase is

$$\mathrm{E}[Y_i \mid S_i = 1] = \mathbf{w}_i'\boldsymbol{\beta} + \rho\,\sigma\,\frac{\phi(\mathbf{x}_i'\boldsymbol{\gamma})}{\Phi(\mathbf{x}_i'\boldsymbol{\gamma})},$$

where ϕ and Φ are the standard normal density and distribution functions. The Inverse Mills Ratio $\lambda_i = \phi/\Phi$ corrects for nonrandom selection. By exploiting valid exclusion restrictions, this approach yields unbiased estimates of $\boldsymbol{\beta}$ even when selection on unobservables is present, outperforming naïve OLS on the full sample or OLS restricted to purchasers (Wooldridge, 2010; Heckman, 1979).

Limitation in Data Collection Despite the inclusion of core underwriting factors in this research, several important limitations must be acknowledged. First, the research does not incorporate certain variables that are routinely used by insurers in actuarial pricing and underwriting, such as detailed medical histories, family

health background, occupation-specific risk, credit scores, and lifestyle factors like alcohol consumption or participation in hazardous activities (Brown and Goolsbee, 2002; Outreville, 2013; Lin and Grace, 2007). The absence of these variables may lead to omitted variable bias, as they are known to significantly affect both the probability of approval and the premium quoted. Second, all underwriting and behavioral variables in this study are based on self-reported survey responses rather than verified administrative or medical records. This introduces the potential for reporting bias, recall error, and social desirability effects, which can attenuate the observed relationships or introduce measurement error (Lusardi and Mitchell, 2014; Lin and Grace, 2007). Furthermore, the use of perceived physical health as a proxy for tobacco use and underlying medical conditions, while practical in survey research, may not fully capture the actuarial risk assessed by insurers through medical exams and laboratory tests. These limitations are consistent with broader challenges identified in the literature on life insurance demand and actuarial analysis, where the lack of granular, objective risk data can constrain the precision of empirical models and the generalizability of findings (Brown and Goolsbee, 2002; Outreville, 2013; Lin and Grace, 2007; Lusardi and Mitchell, 2014).

Justification for Analytical Strategy In the absence of detailed actuarial variables, the full-maximum-likelihood Heckman sample-selection model continues to serve as a reliable framework for identifying the factors influencing both premium and coverage selections. This method simultaneously estimates the purchase decision and the conditional outcome, utilizing valid exclusion restrictions in the selection equation to rectify selection bias due to unobservables and measurement error, thereby providing consistent estimates of $\boldsymbol{\beta}$ despite the absence of critical underwriting factors (Wooldridge, 2010; Heckman, 1979). Modeling term and cash value insurance separately is crucial due to their fundamental differences—term policies offer pure risk protection without a savings component, while cash value policies integrate protection with a savings element—therefore, combining them would obscure product-specific consumer motivations and pricing structures (Outreville, 2013). To ensure transparency and to verify that the variables satisfy modeling assumptions, Table 1 presents the full set of descriptive statistics—mean, median, standard deviation, minimum, maximum, skewness, kurtosis, and number of observations—for every variable employed in the Heckman specifications.

Table 1: *Descriptive Summary*

Label	Mean	Median	SD	Min	Max	Skew	Kurt	N
Psychological price	3.9963	4.00	1.3497	1.00	6.00	-0.587	-0.385	3211
Level of Income	5.0009	5.00	2.0549	1.00	9.00	-0.576	-0.744	3211
Being Married	0.4780	0.00	0.4996	0.00	1.00	0.088	-1.993	3211
Number of dependents	1.5111	1.00	0.6680	1.00	4.00	1.066	0.418	3211
Employed	0.8122	1.00	0.3906	0.00	1.00	-1.598	0.554	3211
Age	49.1548	49.00	18.1502	18.00	93.00	0.087	-1.123	3211
Female	0.5058	1.00	0.5000	0.00	1.00	-0.023	-2.000	3211
Perceived physical health	3.6185	4.00	0.9993	1.00	5.00	-0.650	-0.046	3211
Financial Knowledge	1.5328	1.55	0.7882	0.01	2.55	-0.277	-1.144	3211
Risk Tolerance	0.2100	0.10	0.2417	0.00	1.00	1.321	0.960	3211
Liberal	0.2401	0.00	0.4272	0.00	1.00	1.216	-0.521	3211
Centrist	0.2547	0.00	0.4358	0.00	1.00	1.125	-0.734	3211
Conservative	0.3476	0.00	0.4763	0.00	1.00	0.640	-1.591	3211
Other Political Ideology	0.0258	0.00	0.1587	0.00	1.00	5.973	33.690	3211
Black people	0.1345	0.00	0.3413	0.00	1.00	2.141	2.585	3211
Latino	0.1859	0.00	0.3891	0.00	1.00	1.614	0.605	3211
Native American	0.0221	0.00	0.1471	0.00	1.00	6.497	40.221	3211
Asian	0.0511	0.00	0.2202	0.00	1.00	4.076	14.622	3211
Face value (Term)	3.8910	4.00	1.8134	1.00	7.00	-0.026	-0.996	2036
Premium (Term)	2.4777	2.00	1.0476	1.00	6.00	0.874	1.179	381
Face value (Cash)	3.9516	4.00	1.7079	1.00	7.00	0.084	-0.883	805
Premium (Cash)	2.4476	2.00	1.0966	1.00	6.00	0.794	0.527	420
Level of Education	4.7938	4.00	1.6238	1.00	9.00	0.393	-0.577	3211
Rural	0.1292	0.00	0.3355	0.00	1.00	2.209	2.882	3211
Professional Advisor	0.3142	0.00	0.4643	0.00	1.00	0.800	-1.360	3211

3 Result

The effects of psychological price—modeled as a third-degree polynomial—emerge as both strong and highly significant predictors in all Heckman selection equations for life insurance uptake and premium outcomes (see Table 2). For both term and cash value insurance, the linear (first-order) term of psychological price is strongly positive for uptake (27.77 and 35.13, respectively; $p<0.001$), indicating that as individuals perceive life insurance to be more affordable, their likelihood of purchase rises dramatically. However, the quadratic and cubic terms are both negative and highly significant, revealing substantial nonlinearities: increases in perceived affordability

have diminishing—and eventually reversing—effects at the extremes of the psychological price spectrum. For premium outcomes, the pattern is more complex. For term insurance, the linear coefficient is positive (15.85; $p<0.01$), but the higher-order terms are negative and significant, suggesting premiums rise most at moderate levels of perceived affordability. For cash value insurance, the linear effect is negative and large (-39.67; $p<0.001$), with diminishing negative influence at higher-order terms. Overall, these findings highlight a nonlinear, threshold-dependent relationship between perceived affordability and both the uptake and pricing of insurance products.

The analysis of control variables highlights several factors significantly associated with both term and cash value life insurance uptake and premium determination. Educational attainment demonstrates a strong, positive relationship with term insurance uptake (0.1243, $p < 0.001$) and with the premium paid (0.2007, $p < 0.001$), but does not significantly predict cash insurance uptake or premium, suggesting that education is particularly salient for traditional term products. Financial knowledge is robustly associated with a higher probability of both term and cash insurance uptake (0.2602, $p < 0.001$; 0.1608, $p < 0.05$, respectively), but while it predicts higher term insurance uptake, it has a negative effect on cash insurance premiums (-0.2756, $p < 0.01$), indicating that more financially knowledgeable individuals may opt for less costly cash value products.

Risk tolerance also strongly predicts term insurance uptake (0.8274, $p < 0.001$) and the premium paid (1.1141, $p < 0.01$), with a weaker or non-significant relationship for cash insurance. Similarly, living in a rural area is associated with higher uptake for both product types (0.3213, $p < 0.01$ for term; 0.2707, $p < 0.05$ for cash), possibly reflecting different needs or market access in rural contexts. Among traditional underwriting factors, age is a significant positive predictor for cash insurance uptake (0.0127, $p < 0.001$) and a weakly negative predictor for premium in the cash value model (-0.0062, $p < 0.1$), whereas it is only marginally significant in term insurance outcomes. Employment status and level of income are positively associated with both uptake and premiums in both models, underlining the importance of economic resources in insurance purchase decisions. Other factors, such as being married and the number of dependents, show weaker or inconsistent relationships, with statistical significance limited to certain models and outcomes.

Turning to the exclusion restrictions, several notable patterns emerge regarding the sources of financial advice, political ideology, and race. First, seeking advice from a professional advisor (such as an insurance agent or certified financial planner) is significantly associated with a higher probability of selecting cash value insurance (coefficient = 0.189, $p < 0.05$), but does not show a significant effect on term insurance selection. This suggests that individuals who consult with professionals may be more informed or persuaded about the potential long-term benefits of cash value products compared to those relying on informal advice networks.

Regarding political ideology, we observe a strong, nuanced relationship with life insurance selection. Compared to individuals reporting no political ideology, those who identify as conservative, centrist, liberal, or "other" are all significantly less likely to select term insurance. The negative coefficients are especially pronounced for "other" ideologies (coefficient = -0.741, $p < 0.001$) and for liberals (coefficient = -0.365, $p < 0.001$). In contrast, these same groups are more likely to select cash value insurance, with all effects significant except for the liberal category. The most substantial effect is for "other" ideologies (coefficient = 0.707, $p < 0.01$), with both centrists and conservatives also showing significant positive associations. These patterns point to an important role for political sophistication and value orientation in shaping insurance product preferences.

With respect to race, Black respondents have significantly higher probabilities of selecting both term (coefficient = 0.384, $p < 0.001$) and cash value insurance (coefficient = 0.419, $p < 0.001$) compared to White respondents, even after adjusting for income, education, and other covariates. The association for Latinos is negative for cash value insurance (coefficient = -0.241, $p < 0.1$), while there are no significant effects for Native American or Asian respondents. These findings indicate persistent disparities in product choice by race and ethnicity.

Table 2: *Updated Heckman Selection Models for Term and Cash Insurance Premiums, including polynomial psychological price and political ideology.*

	Term Insurance		Cash Insurance	
	Selection (Uptake)	**Outcome (Premium)**	**Selection (Uptake)**	**Outcome (Premium)**
(Intercept)	-2.7912^{***}	-3.0221^{***}	-2.6054^{***}	3.0449^{***}
	(0.2677)	(0.4838)	(0.2777)	(0.5781)
Main variables				
Attitudinal Variable				
Psychological price (First order, linear)	27.7700^{***}	15.8459^{**}	35.1325^{***}	-39.6661^{***}
	(2.7393)	(5.2498)	(2.6727)	(6.9652)
Psychological price (Second order, quadratic)	-13.9883^{***}	-24.3731^{***}	-13.5477^{***}	-3.9057
	(2.5152)	(4.7325)	(2.3668)	(4.7817)
Psychological price (Third order, cubic)	-12.9947^{***}	-22.5624^{***}	-22.7937^{***}	-2.3766
	(2.5162)	(4.6772)	(2.4914)	(4.9720)
Control variables				
Consumer characteristics				
Level of Education	0.1243^{***}	0.2007^{***}	-0.0053	0.0305
	(0.0257)	(0.0415)	(0.0275)	(0.0374)
Living in a Rural area	0.3213^{**}	0.2766	0.2707^{*}	-0.0860
	(0.1167)	(0.1833)	(0.1203)	(0.1526)
Financial Knowledge score	0.2602^{***}	0.1483	0.1608^{*}	-0.2756^{**}
	(0.0644)	(0.1084)	(0.0639)	(0.0852)
Risk Tolerance	0.8274^{***}	1.1141^{**}	0.0189	0.3871
	(0.2333)	(0.3603)	(0.2622)	(0.3405)
Number of dependents	0.1615^{*}	0.1364	0.0278	-0.1393
	(0.0723)	(0.1158)	(0.0737)	(0.0873)
Underwriting Factors				
Age	0.0041	0.0112^{*}	0.0127^{***}	-0.0062^{+}
	(0.0027)	(0.0045)	(0.0026)	(0.0036)
Female	-0.0773	-0.2291^{+}	-0.0826	0.1346
	(0.0850)	(0.1361)	(0.0849)	(0.1104)
Employed	0.2679^{*}	0.4632^{**}	0.5053^{***}	0.2029
	(0.1039)	(0.1646)	(0.1092)	(0.1682)
Level of Income	0.1123^{***}	0.1196^{**}	0.0465^{+}	0.0813^{*}
	(0.0260)	(0.0422)	(0.0273)	(0.0338)
Perceived physical health	-0.0045	0.1123^{+}	0.0006	0.0590
	(0.0418)	(0.0667)	(0.0416)	(0.0542)
Being Married	0.0693	-0.0095	0.0929	0.2723^{*}
	(0.0985)	(0.1607)	(0.0997)	(0.1200)
Face value		0.0375		-0.0530^{+}
		(0.0295)		(0.0301)
Exclusion Restriction				
Source of Financial Advice (Ref. = Personal Network)				
Professional Advisor	-0.0956		0.1893^{*}	
	(0.0638)		(0.0949)	
Political ideology (Ref. = No ideology)				
Conservative	-0.2886^{***}		0.2864^{*}	
	(0.0858)		(0.1416)	
Centrist	-0.2149^{*}		0.3407^{*}	
	(0.0872)		(0.1474)	
Liberal	-0.3652^{***}		0.1781	
	(0.0884)		(0.1486)	
Other ideology	-0.7414^{***}		0.7065^{**}	
	(0.1847)		(0.2315)	
Race (Ref. = White people)				
Latino	-0.0817		-0.2405^{+}	
	(0.0768)		(0.1229)	
Black people	0.3838^{***}		0.4186^{***}	
	(0.0934)		(0.1246)	
Native American	0.0121		0.1365	
	(0.3446)		(0.4911)	
Asian	0.0034		0.0629	
	(0.1074)		(0.1861)	
Observations	1556 (1175/381)		1595 (1175/420)	
Log-Lik	-916.634		-1088.264	
σ	1.5029^{***}		0.9406^{***}	
ρ	0.9829^{***}		-0.3774^{*}	

Notes: Standard errors in parentheses. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{+}p < 0.1$. Censored/observed counts in parentheses.

The predicted outcome plots (Figure 4) illustrate how psychological price shapes both the probability of life insurance uptake and the premium amount selected. For both term and cash value insurance, the probability of purchasing insurance follows a distinctive nonlinear pattern: extremely low for those perceiving coverage as

highly unaffordable (psychological price near 1), rising sharply to near certainty (over 95%) for moderate to high affordability (psychological price between 4 and 5), and then dropping again as insurance becomes "very affordable" (psychological price near 6). This pattern is robust across all racial groups, though there are subtle differences in the predicted probabilities. For example, Black individuals exhibit a slightly higher peak uptake probability for term life insurance (approaching 99%) compared to other groups, whose peaks range from about 96% to 98%. For cash value insurance, these differences are smaller but still evident, with all groups reaching high predicted uptake rates at moderate affordability.

The analysis of predicted premiums reveals even greater heterogeneity between product types and across the psychological price spectrum. For term life insurance, the premium curve is distinctly nonlinear. At the most unaffordable end, predicted premiums are negative or close to zero (approximately -$2 to $0 in standardized units), suggesting little or no term coverage is selected among those perceiving insurance as out of reach. As psychological price increases, predicted premiums climb rapidly, peaking at approximately $2.6 to $3.0 around "somewhat affordable." This marks the segment most willing and able to buy higher-value term insurance. However, beyond this peak, as psychological price approaches "very affordable," the predicted premium declines dramatically, falling to about - $3.5 at the highest end. The total swing in predicted premium for term insurance thus spans more than $6 units across the psychological price scale, highlighting a substantial nonlinear and non-monotonic behavioral response to perceived affordability. This suggests that as insurance feels easier to afford, some consumers may either downsize their policy, qualify for special low-cost offers, or opt out entirely—possibly reflecting a behavioral "sweet spot" for premium maximization at moderate affordability.

It is important to emphasize that these complex, non-monotonic relationships arise not from contradictory or unstable model results, but from the intentional use of third-degree polynomial terms to capture behavioral subtleties in insurance uptake. While the table reports a strong, positive first-order coefficient for psychological price—indicating that, holding all else constant, higher perceived affordability is associated with greater premium uptake—the significant negative quadratic and cubic terms mean that this effect does not remain constant across the entire range. Specifically, at the lowest levels of psychological price, the negative influence of the higher-order terms outweighs the linear effect, resulting in a decline in predicted premium for those perceiving insurance as extremely unaffordable. As psychological price increases past this trough, the positive linear influence becomes dominant, producing a sharp rise in premium uptake through the moderate affordability range. However, as psychological price continues to increase, the negative higher-order effects reassert themselves, causing predicted premiums to decline again among those who perceive insurance as very affordable. This dynamic captures a realistic behavioral arc: for those who find insurance completely unaffordable, uptake is negligible; for those at moderate affordability, there is an optimal "sweet spot" where willingness and ability to pay converge; and for those perceiving insurance as extremely affordable, premium uptake actually falls—potentially due to opting for simpler, cheaper products or reduced coverage needs. The polynomial specification thus allows the model to flexibly represent both initial inertia and later saturation, reconciling the strong positive linear coefficient in the regression output with the observed downturns at both extremes of the plotted curve. This approach aligns with established econometric literature on discrete choice and non-linear price sensitivity, demonstrating how higher-order polynomials can reveal nuanced, real-world consumer decision patterns that would be obscured by simpler linear models .

In contrast, cash value life insurance displays a more monotonic relationship between psychological price and premium. At the lowest affordability (psychological price near 1), predicted premiums start at a maximum of about $6.3—indicating that only those who can overcome affordability barriers select high-value cash policies. As psychological price increases toward "very affordable," predicted premiums decline smoothly and steadily, reaching close to zero at the highest end. This suggests a broader base of purchasers as insurance becomes easier to afford, but with a shift toward lower-value policies as affordability increases. Racial differences in premium selection for cash value insurance are minor, with all groups following a nearly parallel path along the psychological price spectrum. Taken together, these results demonstrate the importance of accounting for nonlinear and group-specific effects when modeling insurance decision-making: the predicted premium and uptake probability are not simply monotonic functions of affordability, but instead reflect complex, context-dependent consumer behavior that varies by product type and demographic subgroup. This reinforces the need for flexible modeling strategies—such as polynomial terms in selection models—to accurately capture real-world insurance choices.

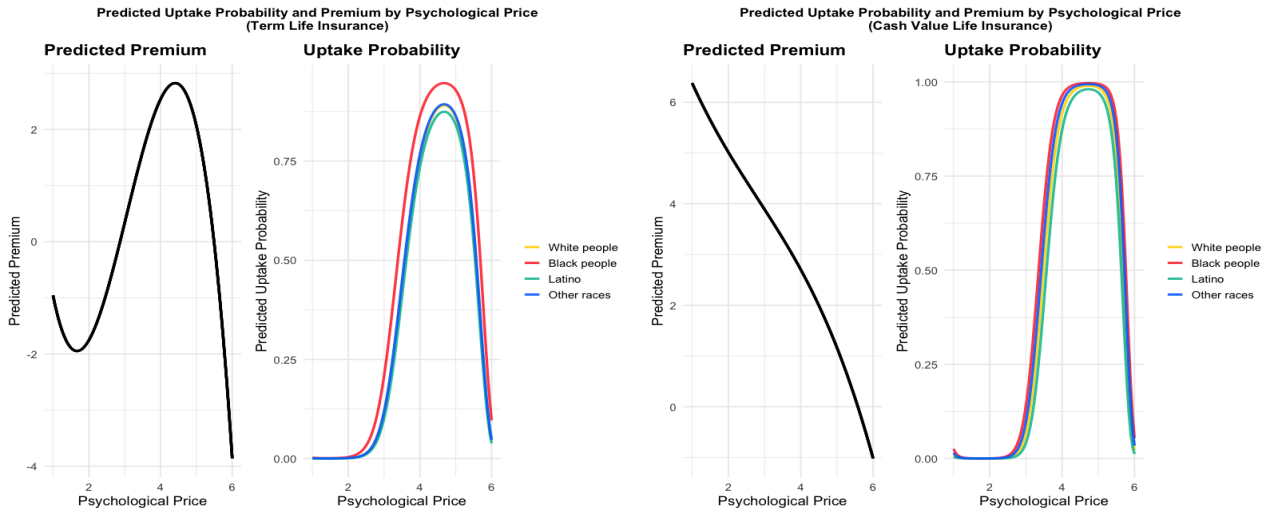

Figure 4: *Predicted relationships between psychological price and both insurance uptake probability and expected premium, as estimated by the Heckman selection model with third-degree orthogonal polynomial terms. Each line shows model-derived predictions for a distinct racial/ethnic group (White people, Black people, Latino, Other races), holding all other covariates at their representative (median or modal) values and setting political ideology to centrist. Premium predictions are shown in black, while uptake probabilities are color-coded by race. These profiles illustrate how predicted insurance outcomes vary across the psychological price continuum for respondents with similar observable characteristics. See Methods for model specification and covariate selection.*

Post-estimation analysis: The direction of the mean IMR (λ) in each group further clarifies the nature of selection into insurance uptake (Table 3). For individuals who do not purchase insurance, the mean IMR is negative (e.g., -0.324 for the term model and -0.308 for the cash value model). This negative value indicates that, after accounting for observed characteristics, these individuals are less likely to select into insurance due to unobserved factors—they possess unmeasured attributes (such as risk aversion, financial constraints, or attitudes toward insurance) that systematically reduce their propensity to buy coverage. Conversely, among individuals who do purchase insurance, the mean IMR is strongly positive (e.g., 1.089 for the term model and 1.101 for the cash value model). This positive value implies that, conditional on observed covariates, there are unobserved influences that increase their likelihood of selecting into insurance. In other words, these purchasers may have additional, unmeasured motivations—such as heightened perceived need, prior experience, or greater financial sophistication—that lead them to opt in at a rate higher than what would be predicted by observed characteristics alone. This clear divergence in the direction of mean λ between groups is critical. It confirms that selection on unobservables is not only present but also asymmetric: unmeasured factors act in opposite directions for purchasers and non-purchasers. From a modeling perspective, this provides direct justification for the Heckman selection approach, as it demonstrates that the error terms in the selection and outcome equations are correlated and that ignoring this would bias premium effect estimates.

Table 3: *Mean Inverse Mills Ratio (λ) by insurance uptake status for Term and Cash Value models, and results of Welch two-sample t-tests comparing groups.*

	Term Model		**Cash Value Model**	
	No	**Yes**	**No**	**Yes**
Mean λ	-0.324	1.089	-0.308	1.101
t-statistic	-94.74		-86.20	
p-value	$< 2.2\text{e-}16$		$< 2.2\text{e-}16$	
95% CI for diff.	$[-1.44, -1.38]$		$[-1.44, -1.38]$	

The density plots of the Inverse Mills Ratio ($\hat{\lambda}$) from the Heckman selection models (Figure 5) provide direct visual evidence of strong selection effects in both term and cash value insurance models. In each panel, the distribution of $\hat{\lambda}$ for individuals without life insurance (labeled "No") is tightly concentrated near zero or slightly below, whereas for those with life insurance ("Yes"), the distribution is shifted markedly to the right, with the bulk of the density around $\hat{\lambda} > 1$.

This clear separation between groups highlights the presence of substantial selection bias. Specifically, individuals who are observed to hold life insurance (term or cash value) not only differ on observable characteristics, but also possess unobserved attributes that systematically increase their likelihood of selecting into

coverage—captured by higher $\hat{\lambda}$ values. Conversely, non-insured individuals tend to have lower or even negative values of $\hat{\lambda}$, indicating the presence of unmeasured factors that reduce their propensity for uptake. The dashed vertical lines in each panel represent the group mean $\hat{\lambda}$ values for the insured and uninsured, with accompanying labels. The means for insured groups are well above zero, while the means for non-insured groups are negative or near zero, reinforcing the notion that the underlying selection mechanism is both strong and asymmetric. The minimal overlap between the two distributions further supports the robustness of the selection process and justifies the use of a Heckman correction. In the absence of such an approach, standard OLS estimates would fail to account for the endogeneity induced by non-random selection, leading to biased inference about determinants of insurance uptake and premium or coverage outcomes.

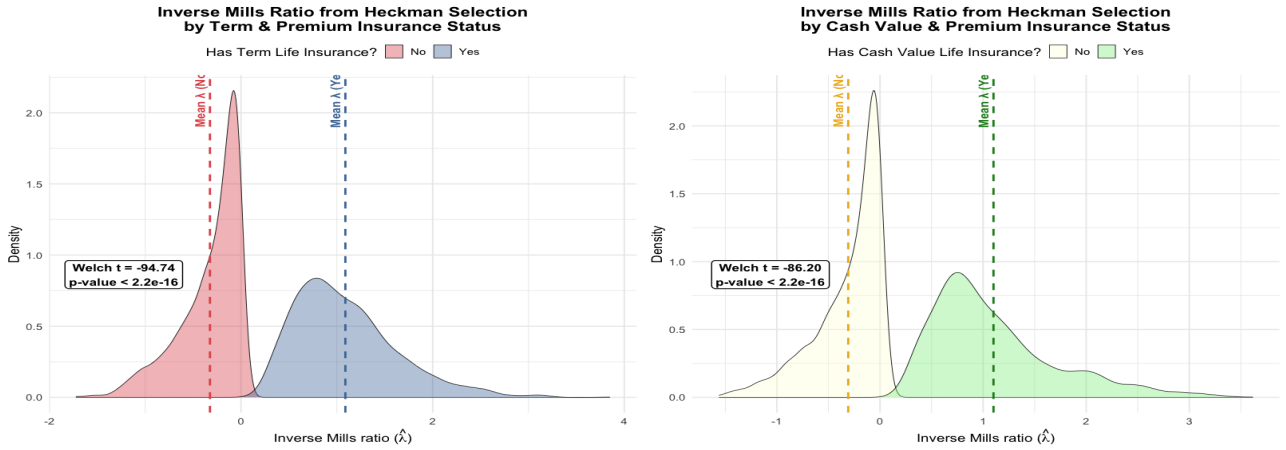

Figure 5: *Inverse Mills Ratio Plot*
Source: Author's analysis of the 2024 FIS

The Variance Inflation Factor (VIF) values in Table 4 indicate that multicollinearity is not an issue in the models, complementing these plots. All VIF values are well below the conventional criterion of 5, predominantly ranging from 1.1 to 2.2, signifying moderate and acceptable correlation levels among predictors. Both ideology and income—the variables exhibiting the greatest VIF values—remain within an acceptable range (ideology variables slightly above 2), especially as they are theoretically substantiated and essential for modeling financial behavior. The comparatively low VIFs in the selection and outcome equations guarantee reliable coefficient estimates and enhance the robustness of the offered Heckman models.

Table 4: *$GVIF^{1/(2\cdot df)}$ for the selection equation and VIF for each outcome equation (Premium only).*

	Selection	Term Insurance: Premium	Cash Insurance: Premium
Out-of-Pocket Burden	1.3347	1.7253	1.5258
Unexpected bills	1.2593	1.4279	1.2633
Medical debt	1.2188	1.3489	1.5198
Level of Income	1.7067	2.0101	2.0239
Being Married	1.3274	1.8175	1.5179
Number of dependents	1.2145	1.4086	1.3292
Employed	1.2576	1.2797	1.1925
Age	1.4636	1.8390	1.8190
Level of Education	1.3028	1.3928	1.6617
Female	1.1085	1.1759	1.2711
Perceived physical health	1.1965	1.2997	1.3068
Financial Knowledge	1.4069	1.6079	1.6673
Risk Tolerance	1.1776	1.2823	1.3235
Living in a Rural area	1.0502	1.0834	1.2226
Liberal	2.0356		
Centrist	2.0270		
Conservative	2.2034		
Other ideology	1.2730		
Professional Advisor	1.3077		
Asian	1.0663		
Black People	1.1887		
Latino	1.1410		
Native Americans	1.0344		

4 Discussion

These findings expand the existing literature on the behavioral drivers of insurance demand, emphasizing the intricate ways in which consumer perceptions of affordability influence both participation and premium rates. The pronounced positive linear effects in the uptake models reflect previous research indicating that perceptions of affordability are critical predictors of insurance participation.(Handel, 2013; Barcellos et al., 2014; Abaluck and Gruber, 2011). Nonetheless, the pronounced negative quadratic and cubic terms indicate that this relationship is not merely monotonic; instead, there exist regions of diminishing and even negative

marginal returns, especially at the extremes of perceived affordability. This pattern aligns with theoretical and empirical research in behavioral economics, which illustrates that consumers' propensity to buy insurance is affected not only by price but also by reference-dependent preferences, inattention, and cognitive overload (Handel, 2013; Baicker, Congdon, and Mullainathan, 2012). Extremely low or high psychological pricing may elicit skepticism or disengagement, hence diminishing demand despite favorable objective costs.

The results for premium outcomes considerably enhance previous findings by demonstrating specific product-type variations in the relationship between perceived affordability and price sensitivity. The nonlinearities in premium response indicate complex linkages between behavioral selection and insurers' pricing tactics, reflecting recent research that demonstrate variability in premium elasticity and benefit selection.(Handel and Kolstad, 2015; Einav and Finkelstein, 2011). The significant negative linear impact of psychological price on cash value premiums indicates that viewing insurance as affordable diminishes the anticipated premium—likely indicative of a self-selection of price-sensitive, lower-risk clients. These observations underscore the necessity of employing flexible, nonlinear modeling frameworks to accurately represent the behavioral response curves in insurance markets, together with the imperative for focused consumer education to prevent adverse selection or policy confusion.

The analysis of control and demographic variables enhances understanding of the factors influencing consumer behavior in term and cash value life insurance markets, building on the significant effects of attitudinal variables, especially the complex, nonlinear impact of psychological price perceptions on insurance adoption and premium choice. These findings underscore the proven significance of socioeconomic and behavioral determinants in life insurance decision-making. The correlation between educational attainment and financial knowledge with insurance uptake aligns with prior studies indicating that information processing capacity and financial literacy improve consumers' capability to comprehend intricate insurance products and diminish purchasing obstacles (Hastings, Madrian, and Skimmyhorn, 2013; Finkelstein, Hendren, and Shepard, 2019). The adverse impact of financial knowledge on cash value insurance premiums may suggest that informed consumers avoid over-insurance or costly features, corroborating evidence that financially astute individuals are less vulnerable to aggressive marketing tactics and more adept at aligning insurance with their requirements (Chen, Tan, and Liu, 2024).

The strong predictive power of risk tolerance for term insurance—both for selection and premium paid—aligns with behavioral economics literature demonstrating that insurance choices are influenced not only by objective risk factors but by subjective perceptions and preferences (Barseghyan, Prince, and Teitelbaum, 2011; Von Gaudecker, 2015). The positive relationship between rural residence and insurance uptake also mirrors findings in the literature that rural consumers face distinct risk exposures and may value risk pooling differently compared to their urban counterparts (Fang, Keane, and Silverman, 2008). The complex influences of age, employment, income, and family structure highlight that although traditional life-cycle and human capital models are beneficial, contemporary insurance choices are progressively influenced by economic limitations and behavioral factors, as evidenced by recent research utilizing experimental and administrative data (Handel, 2013; Barseghyan, Prince, and Teitelbaum, 2011).

The distinct patterns identified regarding political ideology and sources of financial assistance support the hypothesis of political sophistication and its significance in intricate financial decision-making. Political sophistication, which includes both political knowledge and interest, is associated with increased engagement in public affairs and a greater tendency to process abstract or long-term information (Luskin, 1990). Individuals with defined political identities—especially liberals, centrists, conservatives, or those identifying as "other"—may demonstrate increased cognitive engagement and future orientation, rendering them more inclined to acquire complex, long-term financial products such as cash value insurance, rather than opting for simpler term policies. This aligns with research indicating that political sophistication promotes more nuanced and future-oriented economic behaviors (Luskin, 1990; Carpini and Keeter, 1996). Political ideology denotes an aspiration for wealth accumulation and intergenerational strategy, consistent with the tenets of self-reliance (Kölln, 2018; Bartels, 2023).

The role of professional financial advisors is also prominent. Previous research demonstrates that counsel from certified professionals enhances the probability of acquiring cash value or permanent insurance, as advisors frequently highlight the tax-deferred savings, estate planning, and lifetime coverage features of these products (Anagol, Cole, and Sarkar, 2017; Hackethal, Haliassos, and Jappelli, 2012; Koijen and Yogo, 2015). Conversely, informal counsel from relatives and acquaintances sometimes bolsters more cautious or budget decisions, such as term insurance. This conclusion substantiates the assertion that professional counsel not only conveys information but also contextualizes product value propositions in manners that enhance the adoption of intricate insurance contracts (Kling et al., 2012).

The robust, positive correlation between Black people and insurance acquisition—particularly for cash value products—persists even after controlling for socioeconomic position, reinforcing findings from previous studies that emphasize racial disparities in insurance coverage and product preferences (Gutter and Hatcher, 2008;

Harris and Yelowitz, 2018; Wolff, 2006). These gaps may indicate both past inequities in access to conventional life insurance markets and recent efforts by brokers to target minority groups with cash value products. The somewhat adverse impact noted for Latino respondents in the cash value market indicates potential cultural or accessibility hurdles that require further examination.

The diagnostic results strongly confirm the appropriateness of the Heckman selection model for examining life insurance decisions while mitigating selection bias. The significant difference in the Inverse Mills Ratio (IMR) distributions between insured and uninsured respondents confirms the presence of non-random selection into the insurance pool, a premise frequently breached in traditional OLS models. This finding corroborates previous insurance and applied microeconometric studies, which indicate that selection into insurance is often influenced by latent characteristics such as unobserved risk aversion, health risk, or financial confidence (Heckman, 1979; Bernard, Selden, and Fang, 2023). The consistency of this selection pattern in both term and cash-value insurance types emphasizes that selection (the uptake of life insurance) is a universal behavioral phenomenon rather than being specialized to any particular product.

5 Conclusion

This research enhances comprehension of life insurance demand by focusing on attitudinal and cognitive variables, specifically the nonlinear impacts of psychological price, within empirical analysis. Utilizing recent, nationally representative data and a comprehensive two-step Heckman selection model, the results indicate that consumers' perceptions of life insurance affordability do not conform to the simplistic notion that increased affordability directly correlates with heightened demand. Demand exhibits a complex, nonlinear trajectory: uptake and premiums reach their peak at moderate levels of perceived affordability, subsequently declining when insurance is regarded as either too costly or, paradoxically, excessively inexpensive. The concept of a "behavioral sweet spot" underscores the necessity for insurers and policymakers to reevaluate conventional approaches to pricing, marketing, and product design, transcending linear assumptions regarding consumer behavior.

The results indicate that financial knowledge and risk tolerance are significant factors, especially in the context of term insurance; however, their impact is more intricate than previously recognized. Consumers with greater financial knowledge are more inclined to buy insurance; however, they exhibit increased discernment regarding product type and pricing, frequently opting for less costly cash value policies. Risk tolerance is a significant predictor of engagement with term products; however, its influence decreases for cash value coverage, highlighting the differing risk-return assessments consumers apply to various insurance types.

Political ideology, sources of financial advice, and race serve as significant determinants of insurance behavior. Individuals identifying as conservatives, liberal, or centrist and those utilizing professional advisors exhibit a higher propensity to acquire cash value products. On the other hand, Black respondents demonstrate a consistent tendency to possess both term and cash value insurance, even when accounting for socioeconomic status and other confounding variables. The findings demonstrate that sociopolitical context and trust in financial systems are crucial, highlighting ongoing disparities and segmentation within the insurance marketplace.

The application of higher-order polynomials for attitudinal variables, along with a stringent sample-selection correction, establishes a new standard in behavioral insurance modeling. The identification of significant selection bias, indicated by the Inverse Mills Ratio, underscores the necessity for advanced econometric methods in the estimation of demand and outcome equations within insurance research.

Collectively, these findings have significant policy implications. To enhance life insurance participation and address ongoing coverage gaps, insurers should acknowledge the nonlinear characteristics of consumer price perceptions and customize interventions for distinct attitudinal segments. Financial education should extend beyond basic literacy to encompass product-specific knowledge and the identification of behavioral barriers. Regulators must persist in overseeing the function of advisory channels and guarantee equitable access to both term and cash value products among varied populations. With the rise of economic uncertainty and consumer diversity, the significance of behavioral, psychological, and sociopolitical dimensions for the future of financial protection will continue to escalate.

6 Future research

Future research should enhance the integration of behavioral economics with actuarial modeling by examining dynamic consumer responses to changing risk environments, such as economic shocks and policy alterations. Longitudinal studies that integrate administrative and survey data would improve comprehension of the evolution and interaction of psychological price perceptions, financial literacy, and risk tolerance with real-world insurance and health outcomes over time. Furthermore, examining the efficacy of targeted behavioral interven-

tions—such as customized communication, nudges, or financial coaching—across various demographic and ideological groups may produce practical strategies to address ongoing insurance coverage disparities. Cross-national comparisons and qualitative research on consumer decision-making processes would enhance the evidence base, facilitating the design of more inclusive, adaptive, and resilient life insurance systems in both developed and emerging markets.

Bibliography

Abaluck, Jason and Jonathan Gruber (2011). "Choice inconsistencies among the elderly: Evidence from plan choice in the Medicare Part D program". In: *American Economic Review* 101.4, pp. 1180–1210. DOI: 10.1257/aer.101.4.1180.

Alemán, Humberto Meza and Elias A Bedoya Marrugo (2023). "Analysis of the psychology of price and its application in marketing". In: *Journal of Psychology & Clinical Psychiatry* 14.2, p. 46.

Ali, Bayad Jamal and Govand Anwar (2021). "Marketing Strategy: Pricing strategies and its influence on consumer purchasing decision". In: *Ali, BJ, & Anwar, G.(2021). Marketing Strategy: Pricing strategies and its influence on consumer purchasing decision. International journal of Rural Development, Environment and Health Research* 5.2, pp. 26–39.

Anagol, Santosh, Shawn Cole, and Shayak Sarkar (2017). "Understanding the advice of commissions-motivated agents: Evidence from the Indian life insurance market". In: *Review of Economics and Statistics* 99.1, pp. 1–15.

Anderson, Dan R and John R Nevin (1975). "Determinants of young marrieds' life insurance purchasing behavior: An empirical investigation". In: *Journal of Risk and Insurance*, pp. 375–387.

Ansolabehere, Stephen and Douglas Rivers (2013). "Cooperative survey research". In: *Annual Review of Political Science* 16.1, pp. 307–329.

Avraham, Ronen, Kyle D Logue, and Daniel Schwarcz (2013). "Understanding insurance antidiscrimination law". In: *S. cal. l. rev.* 87, p. 195.

Awopeju, OA, ERI Afolabi, and OA Opesemowo (2017). "An investigation of invariance properties of one, two and three parameter logistic item response theory models". In: *Bulgarian Journal of Science and Education Policy* 11.2, pp. 197–219.

Babbel, David F and Craig Merrill (1998). "Economic valuation models for insurers". In: *North American actuarial journal* 2.3, pp. 1–15.

Baicker, Katherine, William J. Congdon, and Sendhil Mullainathan (2012). "Health insurance coverage and take-up: Lessons from behavioral economics". In: *Milbank Quarterly* 90.1, pp. 107–134. DOI: 10.1111/j.1468-0009.2011.00656.x.

Barcellos, Silvia Helena, Amelie Wuppermann, Katherine Grace Carman, Sebastian Bauhoff, Daniel McFadden, and Joachim K. Winter (2014). *Health Plan Choice and Utilization: Evidence from Medicare Advantage*. NBER Working Paper 19954. National Bureau of Economic Research. DOI: 10.3386/w19954. URL: https://www.nber.org/papers/w19954.

Barseghyan, Levon, Jeffrey Prince, and Joshua C Teitelbaum (2011). "Are risk preferences stable across contexts? Evidence from insurance data". In: *American Economic Review* 101.2, pp. 591–631.

Barsky, Robert B, F Thomas Juster, Miles S Kimball, and Matthew D Shapiro (1997). "Preference parameters and behavioral heterogeneity: An experimental approach in the health and retirement study". In: *The quarterly journal of economics* 112.2, pp. 537–579.

Bartels, Larry M (2023). "Measuring political inequality". In: *Unequal Democracies: Public Policy, Responsiveness, and Redistribution in an Era of Rising Economic Inequality*, pp. 77–97.

Battaglia, Michael P, David C Hoaglin, and Martin R Frankel (2009). "Practical considerations in raking survey data". In: *Survey practice* 2.5.

Bernard, Didem M., Thomas M. Selden, and Zhengyi Fang (Nov. 2023). "The Joint Distribution Of High Out-Of-Pocket Burdens, Medical Debt, And Financial Barriers To Needed Care". In: *Health Affairs* 42.11. Accessed: 2025-04-17, pp. 1517–1526. DOI: 10.1377/hlthaff.2023.00604. URL: https://www.healthaffairs.org/doi/10.1377/hlthaff.2023.00604.

Bernheim, B Douglas (1991). "How strong are bequest motives? Evidence based on estimates of the demand for life insurance and annuities". In: *Journal of political Economy* 99.5, pp. 899–927.

Bhatia, Ritika, Anil K Bhat, and Jyoti Tikoria (2021). "Life insurance purchase behaviour: A systematic review and directions for future research". In: *International Journal of Consumer Studies* 45.6, pp. 1149–1175.

Brown, Jeffrey R and Austan Goolsbee (2002). "Does the Internet make markets more competitive? Evidence from the life insurance industry". In: *Journal of political economy* 110.3, pp. 481–507.

Browne, Mark J and Kihong Kim (1993). "An international analysis of life insurance demand". In: *Journal of Risk and Insurance*, pp. 616–634.

Bruhin, Adrian, Helga Fehr-Duda, and Thomas Epper (2010). "Risk and rationality: Uncovering heterogeneity in probability distortion". In: *Econometrica* 78.4, pp. 1375–1412.

Carpini, Michael X Delli and Scott Keeter (1996). *What Americans know about politics and why it matters*. Yale University Press.

Center for Insurance Policy and Research (CIPR) (2020). *Milestones in Racial Discrimination within the Insurance Sector*. Tech. rep. Accessed: 2025-04-15. National Association of Insurance Commissioners (NAIC). URL: https://content.naic.org/sites/default/files/cipr-report-milestones-racial-discrimination.pdf.

Chen, Chuna, Zhuomin Tan, and Song Liu (2024). "How does financial literacy affect households' financial fragility? The role of insurance awareness". In: *International Review of Economics and Finance* 95, p. 103518.

Code, Texas Insurance (2023). *Chapter 544: Unfair Discrimination and Rebates*. Tech. rep. Accessed 15 April 2025. State of Texas.

Cole, Cassandra R and Stephen G Fier (2021). "An examination of life insurance policy surrender and loan activity". In: *Journal of Risk and Insurance* 88.2, pp. 483–516.

Colorado Division of Insurance (2021). *SB21-169: Protecting Consumers from Unfair Discrimination in Insurance Practices*. Technical Report. Accessed 15 April 2025. Colorado Department of Regulatory Agencies, Division of Insurance. URL: https://doi.colorado.gov/for-consumers/sb21-169-protecting-consumers-from-unfair-discrimination-in-insurance-practices.

Crockett, David and Melanie Wallendorf (2004). "The role of normative political ideology in consumer behavior". In: *Journal of Consumer Research* 31.3, pp. 511–528.

Das, Debadyuti, Ashutosh Sarkar, and Arindam Debroy (2022). "Impact of COVID-19 on changing consumer behaviour: Lessons from an emerging economy". In: *International journal of consumer studies* 46.3, pp. 692–715.

DeBell, Matthew and Jon A Krosnick (2009). "Computing weights for American national election study survey data". In: *nes012427. Ann Arbor, MI, Palo Alto, CA: ANES Technical Report Series*.

Delgadillo, Lucy M and Yoon G Lee (2021). "Association between financial education, affective and cognitive financial knowledge, and financial behavior". In: *Family and Consumer Sciences Research Journal* 50.1, pp. 59–75.

Dhanya, M, K Anusree, and Saranya S Varier (2023). "The Role of Fear on the Purchase Intention of Life Insurance Products during Covid-19: An Empirical Investigation among Male and Female". In: *International Journal of Business and Economics* 22.2, pp. 113–131.

Dohmen, Thomas, Armin Falk, David Huffman, Uwe Sunde, Jürgen Schupp, and Gert G Wagner (2011). "Individual risk attitudes: Measurement, determinants, and behavioral consequences". In: *Journal of the european economic association* 9.3, pp. 522–550.

Dragoş, Simona Laura, Codruţa Mare, and Cristian Mihai Dragoş (2019). "Institutional drivers of life insurance consumption: a dynamic panel approach for European countries". In: *The Geneva Papers on Risk and Insurance-Issues and Practice* 44, pp. 36–66.

Edwards, Jeffrey R and Mark E Parry (1993). "On the use of polynomial regression equations as an alternative to difference scores in organizational research". In: *Academy of Management journal* 36.6, pp. 1577–1613.

Einav, Liran and Amy Finkelstein (2011). "Selection in insurance markets: Theory and empirics in pictures". In: *Journal of Economic perspectives* 25.1, pp. 115–138.

Embretson, Susan E and Steven P Reise (2013). *Item response theory for psychologists*. Psychology Press.

Fang, Hanming, Michael P Keane, and Dan Silverman (2008). "Sources of advantageous selection: Evidence from the Medigap insurance market". In: *Journal of political Economy* 116.2, pp. 303–350.

Finkelstein, Amy, Nathaniel Hendren, and Mark Shepard (2019). "Subsidizing health insurance for low-income adults: Evidence from Massachusetts". In: *American Economic Review* 109.4, pp. 1530–1567.

Gale, William G, Kyle D Logue, Nora Cahill, Rachel Gu, and Swati Joshi (2022). "Racial discrimination in life insurance". In.

Giri, Manohar (2018). "A behavioral study of life insurance purchase decisions". In: *Indian Institute of Technology Kanpur, India*.

Gladstone, Joe and Jenna Adriana Maeve Barrett (2023). "Understanding the functional form of the relationship between childhood cognitive ability and adult financial well-being". In: *Plos one* 18.6, e0285199.

Gropper, Michael J and Camelia M Kuhnen (2025). "Wealth and insurance choices: Evidence from US households". In: *The Journal of Finance* 80.2, pp. 1127–1170.

Groves, Robert M (2006). "Nonresponse rates and nonresponse bias in household surveys". In: *International Journal of Public Opinion Quarterly* 70.5, pp. 646–675.

Gutter, Michael S and Charles B Hatcher (2008). "Racial differences in the demand for life insurance". In: *Journal of Risk and Insurance* 75.3, pp. 677–689.

Hackethal, Andreas, Michael Haliassos, and Tullio Jappelli (2012). "Financial advisors: A case of babysitters?" In: *Journal of Banking & Finance* 36.2, pp. 509–524.

Handel, Benjamin R. (2013). "Adverse Selection and Inertia in Health Insurance Markets: When Nudging Hurts". In: *American Economic Review* 103.7, pp. 2643–2682. DOI: 10.1257/aer.103.7.2643.

Handel, Benjamin R. and Jonathan T. Kolstad (2015). "Health Insurance for "Humans": Information Frictions, Plan Choice, and Consumer Welfare". In: *American Economic Review* 105.8, pp. 2449–2500. DOI: 10.1257/aer.20131126.

Harris, Timothy F. and Aaron Yelowitz (2017). "Racial disparities in life insurance coverage". In: *Journal of Risk and Insurance*. URL: http://www.yelowitz.com/Harris_Yelowitz_Life_Insurance_Racial_Disparities.pdf.

Harris, Timothy F and Aaron Yelowitz (2018). "Racial disparities in life insurance coverage". In: *Applied Economics* 50.1, pp. 94–107.

Hastings, Justine S, Brigitte C Madrian, and William L Skimmyhorn (2013). "Financial literacy, financial education, and economic outcomes". In: *Annu. Rev. Econ.* 5.1, pp. 347–373.

Heckman, James J (1979). "Sample selection bias as a specification error". In: *Econometrica: Journal of the econometric society*, pp. 153–161.

Heo, Wookjae, Jae Min Lee, and Narang Park (2021). "Who demands which type of life insurance?: Various factors in life insurance ownership". In: *Financial Services Review* 29.2, pp. 101–119.

Homburg, Christian, Nicole Koschate, and Wayne D Hoyer (2005). "Do satisfied customers really pay more? A study of the relationship between customer satisfaction and willingness to pay". In: *Journal of marketing* 69.2, pp. 84–96.

Hsee, Christopher K and Howard C Kunreuther (2000). "The affection effect in insurance decisions". In: *Journal of Risk and Uncertainty* 20, pp. 141–159.

Jost, John T., Christopher M. Federico, and Jaime L. Napier (2009). "Political Ideology: Its Structure, Functions, and Elective Affinities". In: *Annual Review of Psychology* 60.1, pp. 307–337. DOI: 10.1146/annurev.psych.60.110707.163600.

Kahneman, Daniel and Amos Tversky (Mar. 1979). "Prospect Theory: An Analysis of Decision under Risk". In: *Econometrica* 47.2, p. 263. ISSN: 0012-9682. DOI: 10.2307/1914185. URL: http://dx.doi.org/10.2307/1914185.

Kalton, Graham (2009). "Methods for oversampling rare subpopulations in social surveys". In: *Survey methodology* 35.2, pp. 125–141.

Key, Ellen M and Kathleen M Donovan (2017). "The political economy: Political attitudes and economic behavior". In: *Political Behavior* 39.3, pp. 763–786.

Kim, K. Tae, Michael S. Gutter, and Sherman D. Hanna (2020). "The decrease in life insurance ownership: Implications for financial planners". In: *Financial Services Review* 28.1, pp. 1–16. URL: https://openjournals.libs.uga.edu/fsr/article/download/3412/3036/9729.

Kling, Jeffrey R, Sendhil Mullainathan, Eldar Shafir, Lee C Vermeulen, and Marian V Wrobel (2012). "Comparison friction: Experimental evidence from Medicare drug plans". In: *The quarterly journal of economics* 127.1, pp. 199–235.

Kohn, Samantha (2023). "Life Insurance for Millennials and Gen Z". In: *RateHub*. [Accessed: September 21, 2025].

Koijen, Ralph SJ and Motohiro Yogo (2015). "The cost of financial frictions for life insurers". In: *American Economic Review* 105.1, pp. 445–475.

Kolenikov, Stanislav (2014). "Calibrating survey data using iterative proportional fitting (raking)". In: *The Stata Journal* 14.1, pp. 22–59.

Kölln, Ann-Kristin (2018). "Political sophistication affects how citizens' social policy preferences respond to the economy". In: *West European Politics* 41.1, pp. 196–217.

Kunreuther, Howard, Mark Pauly, et al. (2006). "Insurance decision-making and market behavior". In: *Foundations and Trends® in Microeconomics* 1.2, pp. 63–127.

Lent, Adrienne B, Carlos O Garrido, Emily H Baird, Ruta Viela, and Robin B Harris (2022). "Racial/ethnic disparities in health and life insurance denial due to cancer among cancer survivors". In: *International Journal of Environmental Research and Public Health* 19.4, p. 2166.

Lewis, Frank D (1989). "Dependents and the demand for life insurance". In: *The American economic review* 79.3, pp. 452–467.

Life Happens (2023). *Millennials and Gen Z Lead Growing Need for Life Insurance in 2023*. Tech. rep. [Accessed: September 21, 2025]. NAIFA Community. URL: https://lifehappens.org/research/millennials-and-gen-z-lead-growing-need-for-life-insurance-in-2023/.

Lin, Judy T., Christopher Bumcrot, Tippy Ulicny, Annamaria Lusardi, Gary Mottola, Christine Kieffer, and Gerri Walsh (2017). *Financial Capability in the United States 2016*. Tech. rep. FINRA Investor Education Foundation. URL: https://gflec.org/wp-content/uploads/2016/07/NFCS-2016-Final-Report-2.pdf.

Lin, Yijia and Martin F Grace (2007). "Household life cycle protection: Life insurance holdings, financial vulnerability, and portfolio implications". In: *Journal of Risk and Insurance* 74.1, pp. 141–173.

Lusardi, Annamaria and Olivia S. Mitchell (2014). "The economic importance of financial literacy: Theory and evidence". In: *Journal of Economic Literature* 52.1, pp. 5–44.

Lusardi, Annamaria and Peter Tufano (2017). "Debt literacy, financial experiences, and overindebtedness". In: *Journal of Pension Economics and Finance* 16.4, pp. 332–368.

Luskin, Robert C (1990). "Explaining political sophistication". In: *Political behavior* 12, pp. 331–361.

Mantis, George and Richard N Farmer (1968). "Demand for life insurance". In: *Journal of Risk and Insurance*, pp. 247–256.

Mulholland, Barry, Michael Finke, and Sandra Huston (2016). "Understanding the shift in demand for cash value life insurance". In: *Risk Management and Insurance Review* 19.1, pp. 7–36.

Nkouaga, Florent (2024a). "Comparative effects of self-evaluated and test-based financial literacy on choosing life insurance policies in a multi-racial context". In: *Financial Metrics in Business* 5.1, pp. 352–371.

— (2024b). "Pandemic-Era Trends in US Automatic Payment Adoption: A 2022 Behavioral Analysis". In: *International Business Research* 17.6, pp. 1–1.

Outreville, J François (2013). "The relationship between insurance and economic development: 85 empirical papers for a review of the literature". In: *Risk Management and Insurance Review* 16.1, pp. 71–122.

Pasek, Josh and Maintainer Josh Pasek (2018). "Package 'anesrake'". In: *The comprehensive R archive network*, pp. 1–13.

Poterba, James, Steven Venti, and David A Wise (2013). "Health, education, and the postretirement evolution of household assets". In: *Journal of Human Capital* 7.4, pp. 297–339.

Puhani, Patrick (2000). "The Heckman correction for sample selection and its critique". In: *Journal of economic surveys* 14.1, pp. 53–68.

Rabbani, Abed G. (2020). "Cash value life insurance ownership among young adults: The role of self-discipline and risk tolerance". In: *Journal of Behavioral and Experimental Finance* 27, p. 100385.

Rabin, Matthew and Richard H Thaler (2001). "Anomalies: risk aversion". In: *Journal of Economic perspectives* 15.1, pp. 219–232.

Ropponen, Olli, Tero Kuusi, and Tarmo Valkonen (2023). "Mind the Gap–Assessing the Size and Determinants of the Life Insurance Gap". In: *Journal of the Finnish Economic Association* 4.1.

Simonsohn, Uri (2018). "Two Lines: A Valid Alternative to the Invalid Testing of U-Shaped Relationships With Quadratic Regressions". In: *Advances in Methods and Practices in Psychological Science* 1.3, pp. 538–555. DOI: 10.1177/2515245918805755.

Stapleton, Jane (2021). "Tort, insurance and ideology". In: *Governing Risks*. Routledge, pp. 227–252.

Stenhaug, Benjamin A and Benjamin W Domingue (2022). "Predictive fit metrics for item response models". In: *Applied Psychological Measurement* 46.2, pp. 136–155.

Thaler, Richard (1985). "Mental Accounting and Consumer Choice". In: *Marketing Science* 4.3, pp. 199–214. URL: http://www.jstor.org/stable/183904.

Tversky, Amos and Daniel Kahneman (1992). "Advances in prospect theory: Cumulative representation of uncertainty". In: *Journal of Risk and uncertainty* 5, pp. 297–323.

Von Gaudecker, Hans-Martin (2015). "How does household portfolio diversification vary with financial literacy and financial advice?" In: *The Journal of Finance*, pp. 489–507.

Von Neumann, John and Oskar Morgenstern (2007). "Theory of games and economic behavior: 60th anniversary commemorative edition". In: *Theory of games and economic behavior*. Princeton university press.

Wolff, Megan J (2006). "The myth of the actuary: life insurance and Frederick L. Hoffman's race traits and tendencies of the American negro". In: *Public Health Reports* 121.1, p. 84.

Wooldridge, Jeffrey M (2010). *Econometric analysis of cross section and panel data*. MIT press.

Zhang, Jingzhi (June 2024). "An Empirical Study on the Factors Affecting Life Insurance Charge Premiums". In: EAI. DOI: 10.4108/eai.29-3-2024.2347316.

Zietz, Emily Norman (2003). "An examination of the demand for life insurance". In: *Risk management and insurance Review* 6.2, pp. 159–191.