

RACIAL DIFFERENCES IN THE DEMAND FOR LIFE INSURANCE

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ABSTRACT

The objective of this article is to measure racial differences in the proportion of human capital that households protect with life insurance. Using the 2004 Survey of Consumer Finances data, racial differences in two stages of the process are tested, where it is assumed that households must decide both whether or not to purchase life insurance and how much of their human capital to insure (if they decide to purchase). Among married and cohabitating households, we find that, controlling for demographics and other factors, there is little difference in life insurance ownership between black and white households but that white households insure a larger proportion of their human capital than black households.

INTRODUCTION

Life insurance is traditionally used to ensure that the economic well-being of the household is not adversely affected by the death of any of its members. Racial differences in life insurance, therefore, have direct implications for racial differences in economic well-being. The average white household has a net worth approximately three times greater than that of the average black household (Wolff, 1994; Kennickell, Starr-McCluer, and Surette, 2000). Racial differences in life insurance expenditure can either be mitigating or exacerbating this difference, depending on the direction of these differences. Furthermore, racial differences in life insurance expenditure can help us to better understand the underlying reasons for racial differences in savings and financial planning behavior in general. A household's insurance expenditures are presumably related to the risk aversion of its household members, the relative costs of insurance protection, and the information available to the household regarding both.

All things being equal, one would expect the proportion of human capital that households insure to be equal across races; there are three main reasons why all things may

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not in fact be equal. First, the insurance literature has shown that there are observable characteristics that help explain life insurance demand, and if these characteristics are not possessed by both races equally, then we would expect racial differences. Second, there may be unobservable differences between the races with respect to insurance demand, due in particular to unobservable differences in risk aversion, which could lead to differences in the demand for insurance. There is evidence that black households are less tolerant of risk in the assets they choose to hold (Badu, Daniels, and Salandro, 1999), and that they prefer more liquid assets (Brimmer, 1991). If black households are indeed more risk averse than their white counterparts, this would imply that black households purchase relatively larger amounts of life insurance. Lastly, there could be racial differences in access to life insurance, or differences in actuarially fair prices, that would systematically lead one group to insure more than another.

DETERMINANTS OF LIFE INSURANCE DEMAND

Life-Cycle Economics and the Influence of Risk Aversion on Life Insurance

One of the main paradigms used for framing the decision to buy life insurance is the life-cycle income hypothesis (Ando and Modigliani, 1963), which assumes that households use financial markets to smooth lifetime consumption and, therefore, expected lifetime utility. In the context of life insurance, this means purchasing enough life insurance for each person such that the financial impact of each person's death on the other household members would be 0.

Fischer (1973) was the first to systematically apply the life-cycle model to life insurance purchases. Major theoretical results from this article include the relative importance of bequest motive and actuarial fairness of the life insurance market (as opposed to the bond return) in determining insurance demand. Additionally, the more labor income a person receives (relative to living off the proceeds of one's wealth), the more likely one is to purchase life insurance. Thus, insurance demand should be positively correlated with earnings and negatively correlated with both wealth and age.

The relationships of income and net worth on life insurance ownership have been explored in the literature (Zietz, 2003). Showers and Shotick (1994), using the 1987 Consumer Expenditure Survey, find that income and insurance are positively related. In contrast to theory, Anderson and Nevin (1975), using a sample of 230 young newlyweds from 1968 to 1971, find that net worth actually increased the likelihood of purchase. Hau (2000) confirmed this finding using the 1989 Survey of Consumer Finances data (SCF) and showed that the composition of wealth may also matter. Liquid assets are negatively correlated with insurance demand, whereas homeownership has a positive relationship. The latter may indicate a need for the household production-related income following a spouse's death.

Karni and Zilcha (1986) use a model similar to Fischer (1973) and conclude that risk aversion works in similar ways to Fischer's original conceptualization of "bequest preference." That is, households that are more risk averse would presumably react in ways similar to those who have a larger preference for expected lifetime bequests.

However, the effects of demographic (noneconomic) factors such as family size and education are not as straightforward—there are contradictory findings with respect to sign of the relationships between life insurance purchased and these variables. Showers and Shotick (1994) find that insurance is positively related to family size and age (one of the few studies finding a positive correlation between age and life insurance demand). Gandolfi and Miners (1996) use a sample from the Life Insurance Market Research Association (LIMRA) data of approximately 600 households to look specifically at gender differences in the amount of life insurance between husbands and wives using Tobit analysis. They showed that how young a couple's children are is correlated with more insurance on the mother's life but not on the father's. They also found gender differences in the effects of income and homeownership on the demand for insurance. The different effect of income (bias is toward insuring the husband) may suggest that families implicitly insure the husband's life far more than wives.

Education, which may proxy for exposure to personal finance concepts, is related to life insurance ownership. Goldsmith (1983) uses data from the 1980 LIMRA and finds that households with more educated wives have a lower likelihood of purchasing term insurance on the husband, suggesting that the wife's human capital serves as a substitute for such insurance. Hau (2000) showed that education lowers demand, whereas bequest motives to children and outside the family, in the form of charity, raises insurance demand.

The Role of Race in Financial Management

Numerous studies have catalogued the differences between white and nonwhite households in financial management outcomes such as savings, portfolio choice, and borrowing behavior. In general, these studies have focused either on differences in preferences between races or differences in access or opportunity. Overall, black households have less income and wealth (Kennickell, Starr-McCluer, and Surette, 2000; Aizcorbe, Kennickell, and Moore, 2003). There is also greater uncertainty about earnings for minorities (Cherry, 1989; Hsueh and Tienda, 1996), suggesting that the protection of these resources is even more important for black households. Several studies have examined racial differences in risk tolerance, measured either subjectively or through actual behavior. Regardless, blacks tend to be less risk tolerant. Whites were more likely to be willing to take risk (Sung and Hanna, 1996) and more likely to own stocks (Haliassos and Bertaut, 1995). Using an interaction model, Gutter, Fox, and Montalto (1999) show that race had both direct and indirect effects on risky asset ownership, defined as stocks and small businesses.

A majority of unbanked households are nonwhite or Hispanic (Aizcorbe, Kennickell, and Moore, 2003). There is also considerable evidence that blacks face restricted choices, and therefore higher prices, with respect to some financial services. Redlining in housing mortgage markets is a good example (Klein and Grace, 2001). Although there is a plethora of evidence indicating racial discrimination in mortgage lending (Cloud and Galster, 1993), the evidence is more mixed with respect to life insurance. Harrington and Niehaus (1998) conclude that insurer profits are not higher for

minority insureds, suggesting actuarially fair prices. However, Chan (1998) finds that the quality of insurance coverage is lower in high minority neighborhoods.

MODEL

The model's purpose is twofold: first, to isolate the effect of racial differences in the demand for life insurance, second, to isolate those effects in terms of both the decision to purchase insurance and the proportion of human capital insured. Using household data, the analysis proposed here takes the form

$$Y = f(X, Z, V, \lambda), \quad (1)$$

where Y is the proportion of the household's human capital insured. Y is the quotient of the face value of life insurance possessed by the household, divided by the present value of human capital. X is a vector of economic variables, Z is a vector of demographic variables (including race), and V is a vector of preference variables. The variable λ is the inverse probability of owning any life insurance, where

$$\lambda = f(X, Z, V). \quad (2)$$

Equation (2) will be estimated in a first stage in order to correct for any selection bias in Equation (1) (Heckman, 1974). Equation (2) will allow us to examine racial differences in the decision to purchase insurance in the first place, while Equation (1) will illustrate differences in the proportion of human capital insured.

The X variables are household earnings, relative difference between spouses in earnings, net worth, and an indicator variable for home ownership. We would expect households with higher income to insure less of that income through life insurance, because of decreasing relative risk aversion. Furthermore, we would expect households with more similar incomes between spouses to insure less of that income, since the death of one spouse would have less of an impact on the other. Decreasing relative risk aversion would also mean that households with higher net worth would lead to a lower proportion of their human capital insured, as would home ownership. The Z variables are the ages of the household members, the difference in ages between household members, household size, the presence of children, and the education of household members. The Y variables are self-reported measures on willingness to take risk and whether or not the household intends to leave a bequest.

METHODS

The data for this study are from the 2004 SCF. The SCF is a triennial survey conducted by the Federal Reserve with cooperation from the Department of the Treasury. The SCF uses a dual-frame sample design, which includes an area probability list sample combined with a subsample of higher income households identified through tax returns. This results in a sample that is biased toward higher-income households. This study will utilize the provided weight variable to estimate descriptive statistics. However, since the weight is constructed from income, it does introduce

potential endogeneity bias into a multivariate procedure where income is also included; thus, the multivariate analysis will not be weighted. The sample includes only households where the head of household self-reports as white or African-American and those living with a spouse or partner. This yields a sample of 2,618 households.

The dependent variable for this study is the ratio of life insurance coverage to the present value of human capital. The numerator includes the face value of both term and whole life policies. The denominator is constructed using a technique described in Gutter (2000). This involves calculating the present value of all non-investment income for the household including wages, salaries, pensions, and estimated Social Security benefits. Preretirement earnings are discounted at the real rate of return for equities (7.4 percent) since it generally represents greater uncertainty. Postretirement noninvestment income is discounted at the real rate of return for corporate bonds (2.4 percent) since pensions and Social Security tends to be seen as more fixed in nature. Defined benefit plan estimates are provided by respondents; the timeline for these begins at the planned retirement age and ends based on projected life expectancy. Social Security benefits are estimated using current income to determine the Primary Insurance Amount (PIA). The PIA is adjusted for early retirement or the delayed retirement credit depending on the planned retirement age and the person's Social Security full retirement age. Social Security benefits begin at planned retirement age or the age of 62 years, whichever is later. Life expectancy for all postretirement income is estimated using IRS mortality tables.

Several measures of financial characteristics are included. Total earned income of the respondent is included and log-transformed because of a skewed distribution. The relative difference in earnings between spouses and partners is also included to represent the divergence in resources for each. Household net worth is included and, like the previous two measures, is log-transformed.

RESULTS

Descriptive Statistics

Table 1 shows racial differences in the economic, demographic, and preference-based variables used in the model. Blacks in the sample are slightly younger than whites but there is essentially the same relative age difference (4–5 percent) between partners regardless of race. Household size is just over three for both races; however, more blacks than whites have at least one child in the household. Whites in the sample had greater educational attainment.

On average, whites have greater financial resources than blacks. White respondents had greater earnings than blacks with a lower relative difference than spouses. There was not a significant difference in human capital between blacks and whites; the difference in average ages in the sample may help explain this similarity in human capital. Even though earnings are lower, blacks would likely have a larger number of years of earnings in the sample. Consistent with previous studies (Wolff, 1994; Kennickell, Starr-McCluer, and Surette, 2000) whites had greater

TABLE 1
Household Characteristic by Race

Characteristic	White N = 2,447	Black N = 171	Test for Difference
Demographics			
Age of respondent	49.7	47.3	$T = 5.98^{***}$
Relative difference in age of spouses/ partners	4.62%	4.30%	$T = 0.91$
Household size	3.03	3.21	$T = -1.91$
Presence of a child	52.5%	59.4%	$\chi^2 = 5.5502^*$
Education			
Less than high school	9.66%	16.40%	$\chi^2 = 20.3985^{***}$
High school	29.54%	32.27%	$\chi^2 = 10.0224^{**}$
Some college	21.59%	24.33%	$\chi^2 = 7.0714^{**}$
At least 4 years of college	39.21%	27.01%	$\chi^2 = 47.4653^{***}$
Financial resources			
Respondent's earning	\$24,700.35	\$15,255.04	$T = 2.16^*$
Relative difference in earnings of spouses/ partners	-26.30%	-41.18%	$T = 1.20$
Net worth	\$734,738	\$204,631	$T = 3.35^{***}$
Owns a home	85.08%	59.68%	$\chi^2 = 193.3325^{***}$
Insurance behavior			
Total term face value	\$213,347	\$85,513	$T = 2.22^*$
Total whole life face value	\$69,989	\$34,611	$T = 1.45$
Total whole life cash value	\$9,133	\$4,995	$T = 0.79$
Total face value (term and whole life)	\$283,336	\$120,124	$T = 2.60^{**}$
Present value of household human capital	\$778,387	\$722,654	$T = 0.08$
Ratio of insurance to human capital	0.4006	0.1838	$T = 6.27^{***}$
Preferences			
Not willing to take any investment risk	29.80%	44.30%	$\chi^2 = 46.8633^{***}$
Willing to take average investment risk	47.71%	42.56%	$\chi^2 = 2.6585$
Willing to take above-average investment risk	22.49%	13.14%	$\chi^2 = 19.7934^{***}$
Desire to leave a bequest	6.64%	4.52%	$\chi^2 = 4.6640^*$

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

levels of net worth; they also had greater incidence of home ownership than blacks.

Whites had greater usage of life insurance; whites had more term insurance, but not a significant difference in whole life policies. Whites also had greater proportion of their human capital insured (40 percent for whites and 18 percent for blacks).

Consistent with previous findings (Yao, Gutter, and Hanna, 2005), blacks have lower willingness to take investment risk than whites. More blacks than whites were not willing to take any investment risk, whereas more whites than blacks were willing to take above-average investment risks than blacks. More whites than blacks stated a desire to leave a bequest than blacks.

Racial Differences in the Presence of Insurance

Two linear probability models were estimated to assess racial differences in couples having life insurance. A “reduced” model with an intercept term for race (Equation (2)), and a “full” model with race interacted with other explanatory variables, were estimated and compared. The full model was used to explore whether or not the “race effect” could be decomposed into racial differences in the relationship between explanatory variables and insurance demand. Only one interaction term proved significant, the interaction between net worth and race. Thus the reduced model was the appropriate model. The reduced model showed no significant relationship between the racial classification of the household and whether or not they owned life insurance.

Incidence of having life insurance increased with age, but decreased as the relative difference in ages of the couple increased. Other household composition measures were not significantly related to having life insurance. Those who completed high school were more likely to own life insurance. There were no significant differences in having life insurance beyond high school.

The likelihood of having life insurance increased with the level of the respondent’s earnings. Net worth was not significant, except as an interaction term. Thus, net worth increased the likelihood of having life insurance, but only for blacks. This is of interest since net worth was not significant in the reduced model nor did it have a significant relationship for whites in the full model. Additionally, homeowners were more likely to have life insurance. Only one preference measure was significantly related to life insurance ownership. Those not willing to take investment risks were more likely to own life insurance.

Racial Differences in the Proportion of Human Capital Insured

For the second part of the analysis—explaining the proportion of human capital insured—a Tobit was used in favor of the afore-mentioned two-step procedure for a number of reasons. First, race was not a significant factor in what would have been the first stage of the procedure (see Table 2). Second, when the two-step procedure was used, the inverse Mills ratio was insignificant, suggesting that a one-step procedure (such as Tobit) was more appropriate. Additionally, the fact that λ was determined by all of the variables, which are reintroduced in the second stage, means that the two-step procedure introduces significant bias into the estimates of the variance of the regression estimates. Although what follows discusses the Tobit results, the results of ordinary least squares regression (Equation (1)), using the results from the reduced model in Table 2 as the first step, is given in the Appendix.

The Tobit analysis (Table 3) shows that black households had lower proportion of human capital insured than otherwise similar whites. As with the first stage, a full interaction model was used to attempt a decomposition of the race effect. The likelihood ratio statistic led to a rejection of the reduced model; however, only one interaction term was significant, the term for net worth and race. This result suggests that increasing net worth led to less of a propensity to raise the proportion of human capital insured for blacks than it did for whites.

TABLE 2

Results of the Probit Analysis for the Likelihood of Having Any Life Insurance: Reduced and Full Interaction Model

Variable/Model	Reduced Model	Full Model: Main Effects	Full Model: Interaction Effects Race $\times$ X_i
Intercept	-0.2280	0.0929	
Demographics			
Age of respondent	0.0076**	0.0083**	-0.0016
Relative difference in age of spouses/ partners	-1.6522***	-1.7670***	1.0821
Household size	0.0118	0.0234	-0.0600
Presence of a child	0.1940	0.1722	0.0929
Respondent is African-American/black	0.0465	-0.1650	
Education			
Less than high school	-0.4942***	-0.5514***	0.3497
High school		Reference	
Some college	0.0507	-0.0607	0.0435
At least 4 years of college	0.0256	-0.0255	0.0742
Financial resources			
Natural log of respondent's earning	0.0374***	0.0376***	0.0017
Relative difference in earnings of spouses/ partners	-0.0260	-0.0416	0.0741
Natural log of net worth	-0.0081	-0.0151	0.0381*
Owns a home	0.6949***	0.7089***	-0.0791
Preferences			
Not willing to take any investment risk	0.4444***	-0.4606***	0.0449
Willing to take average investment risk		Reference	
Willing to take above-average investment risk	-0.0210	0.0261	-0.0344
Desire to leave a bequest	-0.0465	-0.0305	-0.1037

Note: Likelihood ratio = 24* (14df).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Financial resources had varying relationships with proportion of human capital insured. Earnings were negatively related to the proportion, whereas net worth was positively related. Based on previous literature, we would have expected both to be negatively related. However, the interaction term with race shows that the wealth effect is close to 0 when looking exclusively at the relationship between net worth and the proportion of human capital insured among black households.

Older households had lower proportion of human capital insured, a finding consistent with some but not all previous studies. The proportion of human capital insured increased with the relative difference in age between spouses and partners. This is expected since greater differences in age would likely mean greater chance of

TABLE 3

Results of the Tobit Analysis on the Proportion of Human Capital Insured

Variable	Reduced Model Coefficient	Full Model: Main Effects Coefficient	Full Model: Interaction Effects Race $\times$ X_i Coefficient
Intercept	0.7148	-0.7010	
Demographics			
Age of respondent	-0.0083**	-0.0103**	0.0070
Relative difference in age of spouses/ partners	0.8527**	0.9153**	-0.6929
Household size	0.0538	0.0582	-0.0740
Presence of a child	-0.0279	-0.0212	-0.1831
Respondent is African-American/black	-0.2681*	0.5176	
Education			
Less than high school	0.2708	0.2836	-0.0919
High school	Reference		
Some college	0.2482*	0.2480*	0.0587
At least 4 years of college	0.5432***	0.5188***	-0.1333
Financial resources			
Natural log of respondent's earning	-0.0259***	-0.0281***	0.0320
Relative difference in earnings of spouses/ partners	0.0667	0.0740	-0.0288
Natural log of net worth	0.0859***	0.1023***	-0.099011***
Owns a home	-0.4092**	-0.4004**	0.0288
Preferences			
Not willing to take any investment risk	-0.0791	-0.0536	-0.0114
Willing to take average investment risk	Reference		
Willing to take above-average investment risk	0.1772*	0.1706*	-0.1955
Desire to leave a bequest	0.4051**	0.3983***	-0.1458

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

widowhood. Household size and having a child were not significantly related to the proportion of human capital insured. The proportion of human capital insured increased with education. Compared to those with only a high school education, those with some college or at least 4 years of college had greater proportion of human capital insured.

CONCLUSIONS

The results here suggest that there is little difference between blacks and whites in whether or not to purchase life insurance, but a significant difference in how much life insurance one purchases. Even after accounting for the differences in human capital between blacks and whites, we find that black households insure an even lower *proportion* of that human capital than their white counterparts. This could be interpreted in several different ways. First, there might be measurement error in the

way human capital is measured, such that the human capital of white households is overestimated relative to black households. If this were true, then it might mean that black and white households insure similar amounts of their human capital but the analysis failed to capture substantially more white human capital than black human capital. If no such measurement bias exists, the results would imply that the black households in the sample are more willing to take risk than the whites (the results do control for the household's perceived willingness to take investment risk, so these differences would have to be independent of this self-reported, rather subjective measure). If this were true, it would contradict most previous studies on willingness to take on investment risk, where it is found that blacks are more risk averse, not less. It would also imply a greater vulnerability to the financial loss from the death of a breadwinner for black households.

Although it is possible that whites could be more risk averse when they go to the insurance salesman, but then less risk averse when they go to the stockbroker, a more likely explanation might have more to do with access to financial services in general. For example, Table 2 shows that the effect of net worth on likelihood of insurance is negative (as expected), but this relationship for black households is approximately 0 (when you include the interaction term). This means that lower net worth black households are not using life insurance to protect themselves in the same way lower net worth white households are. This lack of sensitivity to the household's financial position may be indicative of a lack of either initiative or access to engage in practices that protect and grow one's financial position, such as purchasing the appropriate amount of life insurance or more aggressive investing.

If race is representative of culture (Ogden, Ogden, and Schau, 2004), then perhaps the difference in the proportion of human wealth that one insures is related to the differences in the perceived choices and consequences of deciding to insure. If prices are actuarially fair, then the lower usage of life insurance may imply that there is an additional method of protection used by black households against loss of a breadwinner. This could be in the form of social or family capital. There may also be a natural hierarchy with respect to the use of financial instruments such as insurance and investing. With lower financial resources overall, the need for allocation across activities might lead to lower participation levels in any one activity. Especially since insurance premiums are not necessarily actuarially fair, and investment transactions costs are not always negligible.

Although profits may not be higher for minority insureds (Harrington and Niehaus, 1998), a follow-up study should examine racial differences in insurance expenditure patterns per level of coverage and product type to examine quality of insurance products being offered. In addition, if insurance is sold and not bought (Bernheim et al., 2003), then it may be necessary to examine characteristics of insurance agent or whoever solicited the business from the household. Perhaps there are differences in the types of recommendations being made based on the perceived race or ethnicity of the customer, the agent, or the interaction between the two. These differences may not be an issue of ethics but of structural differences in providers of life insurance to minorities. This explanation would be akin to that of redlining in the housing market (Klein and Grace, 2001).

APPENDIX**Results of the OLS Selection Bias Corrected Regression for the Proportion of Human Capital Insured**

Variable	Coefficients
Intercept	-3.05167***
Demographics	
Relative difference in age of spouses/partners	0.09298
Household size	0.04833
Presence of a child	0.17260
Respondent is African-American/black	-0.33197*
Education	
Less than high school	-0.19998
High school	Reference
Some college	0.28335*
At least 4 years of college	0.59121***
Financial resources	
Natural log of respondent's earning	-0.01907
Relative difference in earnings of spouses/partners	0.07469
Natural log of net worth	0.12243***
Owns a home	-0.09067
Preferences	
Not willing to take any investment risk	-0.42421*
Willing to take average investment risk	Reference
Willing to take above-average investment risk	0.21317*
Desire to leave a bequest	0.43553***
Lambda	-0.05627

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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