DESPERATION OR DESIRE? THE ROLE OF RISK AVERSION IN MARRIAGE

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Because of the uncertainty inherent in searching for a spouse and the uncertainty of the future quality and state of the marriage itself, risk attitudes likely directly impact the timing of marriage. The effect of an individual's risk aversion, measured via a series of hypothetical gambles over income on time to marriage, is examined using survival analysis. I find risk aversion significantly affects time to marriage, with more risk averse respondents marrying sooner than their more risk-loving counterparts. Within-family analyses using sibling data reveal a similar pattern. In addition, the effect of risk aversion on time to marriage is larger in magnitude and more statistically significant for men. One possible explanation for the different results between the sexes is that women value risk aversion as a desirable trait in potential mates. (*JEL* J10, J11, J12, J16)

I. INTRODUCTION

Attitudes toward risk are an important determinant of a vast array of decisions. Such decisions include ones with a big impact on life: the choice of education, the choice of career, investment decisions, and even when and if to get married or divorced. Most empirical studies of behavior implicitly assume risk preferences are identical across households. Such a research strategy undoubtedly results in appreciably different predictions of behavior than would occur if risk preferences are permitted to vary. While an increasing number of surveys are asking respondents questions that allow for construction of a measure of interpersonal variation in risk that is based on economic theory, there is still a paucity of empirical studies that explicitly investigate the impact of risk preferences on behavior.[1]

I use information on risk preferences from the National Longitudinal Survey of Youth 1979 (NLSY79) to predict how interpersonal variation in these preferences affects the time to marriage decision. Because of the uncertainty inherent in searching for a partner and the uncertainty of the future quality and state of the marriage itself, risk attitudes likely directly impact the timing of marriage. Risk preference variables are constructed from a series of hypothetical gambles over lifetime income that were offered to respondents in the NLSY79. I examine how the risk preference variables affect the hazard rate into marriage and find that the more risk averse marry sooner. I also exploit sibling data from the NLSY79 to examine the robustness of the empirical results by controlling for unobserved family effects that might be

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1. The two main methods that have been used to calculate measures based on economic theory (an Arrow-Pratt measure) are (a) evaluating the actual behavior of individuals and (b) asking them hypothetical questions with specific scenarios. For both methods, the argument of the utility function has varied (consumption and asset allocation, e.g.). Not all data sets contain consumption information, and asset information is often incomplete and inaccurate. Since this is the case with the NLSY79, the data used in this study, the focus here will be on studies that construct an empirical measure of risk aversion through hypothetical questions asked of respondents. Unlike many studies that evaluate actual behavior, these studies allow construction of a risk aversion measure for a representative sample of the population and do not focus on just one segment of the population, such as stock market investors or agricultural producers.

ABBREVIATION

NLSY79: National Longitudinal Survey of Youth 1979

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correlated with risk attitudes and find qualitatively similar results. In addition, I find that risk preferences affect the timing of marriage differentially for the sexes, with a larger and more statistically significant effect of risk preferences on the hazard rate into marriage for men. One possible explanation for this finding is that women value risk aversion as a desirable characteristic in a spouse. To explore this possibility, I analyze spouse characteristics by the risk aversion of the respondent. I find that spouse quality, in terms of education and other measurable traits, is generally lower for more risk averse men than for more risk-loving men. This finding is in accordance with a prediction of a search model: the reservation "price" is decreasing in risk aversion. Spouse quality of more risk averse women is usually but not always lower than for more risk-loving women, suggesting that the effect of a woman's own risk aversion on time to marriage may be more complex than suggested by a search model. Overall, the results suggest that risk preferences have some causal influence on the timing of marriage, whether it be from a supply-side standpoint, such as in the case of a basic search model, or from a demand-side standpoint, where risk aversion is a desirable trait.

This article contributes to a sparse literature that employs empirical measures of risk aversion. Many of these studies ask how demographic characteristics affect risk attitudes.[2] A few ask how these measures of risk aversion affect behaviors like the propensity to smoke or invest in risky assets.[3] These studies are, however, cross sectional and do not employ survival analysis as does this article. To my knowledge, only two existing studies (Light and Ahn, 2008; Schmidt, 2008) employ an empirical measure of risk aversion to investigate the relationship between risk preferences and the marriage market. Schmidt focuses on fertility but also considers marital timing of employed women, and Light and Ahn focus on divorce timing. The findings of both studies are consistent with mine.[4] My study adds to Schmidt's by considering all women and men and exploring the differences between the genders, including a discussion of how spousal characteristics might differ by the risk aversion of respondents. I also am able to better address possible reverse causation by making use of the fact that the risk attitudes questions are asked earlier and more than once in the NLSY79. Beyond this article's contributions of enhancing our understanding of how risk attitudes affect behavior and what motivates (at least from an economic perspective) individuals to get married, the findings here have broader implications. If earlier marriages are more likely to end in divorce, or the more risk averse are more likely to stay in a bad marriage, then risk attitudes impact welfare through the marriage market, not just through the financial market.

The remainder of the article is organized as follows. Section II presents the theoretical considerations, while Section III discusses the data and descriptive statistics. Section IV presents and discusses the empirical findings. Finally, the last section contains concluding remarks.

II. THEORETICAL MOTIVATION

The question remains: Does marriage attract the risk averse sooner than risk lovers, all else equal? This question is an empirical one, as different theories predict different answers to this question. I propose that there

2. See, for example, Miyata (2003), Hartog, Ferrer-i-Carbonell, and Jonker (2002), and Donkers, Melenberg, and van Soest (1999). A common finding is that observable characteristics tend to explain a small amount of the variation in risk aversion among people. Other findings include that females are more risk averse than men, older individuals exhibit more risk aversion, the self-employed are less risk averse, and income is negatively correlated with risk aversion, In one data set used by Hartog et al., single and cohabiting individuals are less risk averse than married couples. Miyata, using the results of investment games played by 400 households in rural Indonesia to identify attitudes toward risk, finds that one's living situation is significant; an individual living with parents is less risk averse than one living in a nuclear household.

3. See, for example, Barsky et al. (1997) and Guiso and Paiella (2001). Risk attitudes are found to be correlated in an expected way with behavior almost without exception. For example, the more risk tolerant are more likely to smoke, drink heavily, have no health or life insurance, hold stocks or risky assets, work in the private sector, be self-employed, and immigrate.

4. While much of Schmidt's (2008) article focuses on risk attitudes and fertility, she also considers how risk aversion affects marital timing for women only and finds that the more risk averse do marry sooner. She uses the Panel Study of Income Dynamics (PSID), where the risk attitudes questions asked are the same as in the NLSY79. However, in the PSID, the questions are only asked once in 1996 and asked only of employed respondents. Thus, while almost all unmarried women answered the risk questions, only about half of married women did so. Light and Ahn (2008) use the NLSY79 and find that the more risk averse are least likely to divorce from a first marriage.

are two main reasons why risk aversion and age at marriage are inversely related. The first entails a marital search model in which individuals search for a mate in the presence of uncertainty about the quality of potential future mates. The second is that marriage provides a way to pool risk in the face of potential unexpected shocks such as an illness or a job loss.

In the context of the search model, marrying sooner than the average person should be attractive to the risk averse because it mitigates the uncertainty of the future. Finding an "acceptable" mate is easier than finding the "perfect" mate, and the risk averse searcher may be willing to accept one of the first options that comes along because waiting for a potentially better option is not worth the uncertainty. As Pissarides (1974) and Lippman and McCall (1976) argue in the job search literature, more risk averse individuals attach less value to further search because any searcher must compare an offer that is known with the uncertainty of another draw from the wage distribution.

Consider a simple one-sided partial equilibrium model of marital search in the spirit of the familiar one-sided job search model. Here, however, it is necessary to relax the standard assumption of risk neutrality and allow for concavity of the utility function. Searchers are infinitely lived and identical in all respects except for their degree of risk aversion, with discount factor β and concave monotonically increasing utility functions $U_i(q_i)$, where q_i denotes the quality of the offer received by searcher i in the marriage market. Quality is an index of traits of the individual making the offer, which captures their worth as a marriage partner. It may include measurable traits such as income as well as intangible characteristics. Also assume that all singles are part of the marriage market, women are searchers, with men making the offers.

Women receive a single offer per period from the distribution $F(q)$ with support $[0,\infty)$, taken as given for now, so that the probability of receiving an offer does not depend upon the man's level of risk aversion. The offer at hand can be accepted and the marriage lasts forever[5] or the offer can be rejected and the woman can continue searching without the possibility of recalling previous offers of marriage. Denote the present discounted value of an offer of quality level q_i as Q_i and the present discounted utility from searching as S_i. Then, the payoff to accepting a current offer of q_i^0 can be expressed as follows:

$$Q_i^0 = \frac{U_i(q_i^0)}{1-\beta}. \tag{1}$$

Assuming no costs to search and that the flow of utility equals zero while searching, the value of searching for one more period is:

$$S_i = \beta E_q\{\max(Q_i, S_i)\}. \tag{2}$$

The offer is accepted if $Q_i^0 \geq S_i$, implying a reservation quality $\bar{q}_i$ such that:

$$\frac{U_i(\bar{q}_i)}{1-\beta} = S_i, \text{ or } \frac{U_i(\bar{q}_i)}{1-\beta} = \beta E_q\left\{\max\left(\frac{U_i(q_i)}{1-\beta}, \frac{U_i(\bar{q}_i)}{1-\beta}\right)\right\}. \tag{3}$$

Then,

$$\frac{U_i(\bar{q}_i)}{1-\beta} = \beta \int_0^{\bar{q}} \frac{U_i(\bar{q}_i)}{1-\beta} \partial F(q) + \beta \int_{\bar{q}_i}^{\infty} \frac{U_i(q_i)}{1-\beta} \partial F(q). \tag{4}$$

This is equivalent to:

$$\frac{U_i(\bar{q}_i)}{1-\beta} = \frac{\beta}{1-\beta} U_i(\bar{q}_i) + \frac{\beta}{1-\beta} \int_{\bar{q}}^{\infty} [U_i(q_i) - U_i(\bar{q}_i)] \partial F(q), \tag{5}$$

which simplifies to:

$$U_i(\bar{q}_i) = \frac{\beta}{1-\beta} \int_{\bar{q}}^{\infty} [U_i(q_i) - U_i(\bar{q}_i)] \partial F(q). \tag{6}$$

Equation (6) implicitly defines the searcher's reservation quality $\bar{q}_i$, equating the opportunity cost of searching one more period with the expected lifetime benefit of one more search, given the current offer q_i^0. In other words, Equation (6) holds when $q_i^0 = \bar{q}_i$.

5. When this assumption is relaxed and an exogenous probability of divorce is allowed, the relevant predictions of the search model still follow.

To determine how an individual's risk aversion affects the reservation wage, Pratt's (1964) theorem is useful. Pratt defines the risk premium r_i as the amount of money that makes an individual indifferent between a certain amount and a gamble with an expected value equal to the certain amount; that is,

$$EU_i(I) = U_i(\mathrm{EI} - r_i). \tag{7}$$

If $r_i > 0$, then the individual is risk averse. Pratt also shows that the risk premium varies directly with the Arrow-Pratt coefficient of absolute risk aversion. Given this definition of the risk premium, it is not difficult to see how r_i affects the search problem in the current context. A positive risk premium increases the opportunity cost of searching one more period or, equivalently, decreases the expected lifetime benefit of another search. The higher the risk premium, the more quality that is required to induce the individual to give up the certain offer in the current period for the uncertain outcome of further search.

To show this more rigorously, assume that there are two levels of risk aversion among searchers. Type A searchers are more risk averse than type B searchers, so

$$U_A(q) = G[U_B(q)] \tag{8}$$

for some strictly concave and monotonically increasing function G. Pratt's theorem implies that $r_A > r_B$ for all q. If the two searchers are faced with the same quality distribution then the more risk averse searcher has the lower reservation quality level. In other words, given $F(q)$, if $U_A(q) = G[U_B(q)]$ for all q then $\bar{q}_A < \bar{q}_B$. In the context of job search, this result has been established by Nachman (1975), Hall, Lippman, and McCall (1979), and Vesterlund (1997).[6] It is well known that a lower reservation level leads to an earlier optimal stopping time, so the expected duration of singledom is shorter for the more risk averse. This results simply because the per period probability of accepting an offer is $(1 - F(\bar{q}_i))$, which is decreasing in $\bar{q}_i$.

6. See the Appendix for proof of this proposition.

The one-sided search problem can be extended to a two-sided one, for now maintaining the assumption that a potential partner's risk aversion does not enter an individual's utility function through the quality index. Both sexes are searching, and for simplicity, assume each searcher is matched with another once per period. One sex initiates an offer and does so if the other's quality exceeds their reservation level. The offeree accepts if their reservation quality level is exceeded, so the more risk averse the offeree, the more likely the acceptance occurs. Thus, in the basic two-sided model, the prediction that the more risk averse marry sooner still holds. The simple two-sided model adds the assortative mating prediction that the more risk averse also marry the more risk averse. Unfortunately, the data at hand will not allow a test of the assortative mating prediction.

Second, the benefit of pooling and sharing risk between two people is another reason why a more risk averse individual might marry sooner. For example, if both spouses work and one faces an unemployment spell, one income remains to support the couple in the interim. The shorter the time to marriage, the sooner the risk averse individual can insure themselves against exogenous income shocks. However, the higher the quality (a function of income) of a potential spouse, the greater the insurance provided against exogenous income shocks. This could, ceteris paribus, increase the reservation quality level of an individual and based on the simple search model, actually delay marriage. Thus, a tradeoff exists and it is not clear that a more risk averse person will marry a spouse of lower quality if risk pooling is the only concern.

However, there are also plausible arguments that being risk averse can unequivocally delay marriage. It can be argued that marriage itself is a risky endeavor, given the possibility of divorce, which is more costly than ending a cohabiting union. Thus, some may prolong the search process to find a better match and hence delay marriage. In addition, some individuals may fear losing a spouse to an accident, an illness, or vice versa. Certainly, this argument applies to individuals who are "emotionally risk averse," which, according to recent research, is likely correlated with financial

risk aversion.[7] An additional reason that risk aversion may delay marriage is that risk averse individuals may prefer to have a larger amount of savings accumulated before marriage than a more risk-loving individual. This idea relates to the "economic provider" hypothesis, which argues that a decrease in real wages can lead to a delay in marriage, especially for men who have historically been the breadwinners.[8]

III. DATA AND EMPIRICAL SPECIFICATION

The NLSY79, which began annual interviews in 1979 with more than 12,000 individuals aged 14–22, continued interviewing that sample annually through 1993 and since 1994 has followed the group with interviews every 2 yr. The NLSY79 contains three subsamples: a cross-sectional sample of 6,111 respondents designed to be representative of the civilian U.S. youth population; a supplemental sample of 5,295 respondents designed to oversample civilian Hispanic, black, and economically disadvantaged nonblack/non-Hispanic U.S. youth; and a sample of 1,280 respondents designed to represent the population aged 17–21 who were enlisted in the military.

Following the 1984 interview, 1,079 members of the military subsample were no longer eligible for interview. Following the 1990 interview, none of the 1,643 members of the economically disadvantaged, nonblack/non-Hispanic subsample were eligible for interview. In 1993, a key year for this study, 9,011 individuals were available for interview, and they are followed in this study from 1979 until 2002. Because the household was the primary sampling unit in the initial surveys, several thousand pairs of siblings are included in the data, and this will prove useful in the empirical estimation.

One advantage of using the NLSY79 for this analysis is the detail of respondents' marital histories. Information on marriages and divorces is not limited to marital status at the time of interview. At each interview, respondents are also asked for the month and year each of their marriages began and ended. This serves to fill in missing information if a respondent has not been interviewed each year of the survey and also serves to clarify and correct inconsistent marital history data.

A. Risk Measure

An underused series of questions from the 1993 wave of interviews allows construction of a variable indicating an individual's attitude toward income risk. Respondents, then aged 28–36, were asked two questions relevant to constructing this variable. All respondents were asked the following question (Gamble 1):

> Suppose that you are the only income earner in the family, and you have a good job guaranteed to give you your current (family) income every year for life. You are given the opportunity to take a new and equally good job, with a 50-50 chance that it will double your (family) income and a 50-50 chance that it will cut your (family) income by a third. Would you take the new job?

If the answer was "no," respondents were then asked the following (Gamble 2):

> Suppose the chances were 50-50 that it would double your family income and 50-50 that it would cut it by 20 percent. Would you take the new job?

If the answer to the first question was "yes," respondents were asked the following (Gamble 3):

> Suppose the chances were 50-50 that it would double your family income and 50-50 that it would cut it in half. Would you still take the new job?

These three questions allow categorization of respondents into four groups. Respondents who answered "no" to both questions will

7. In previous studies, it has been common to assume that a single, intrinsic risk preference, measured by taking chances over money, dictates risk taking in all spheres of life. However, there are different kinds of risk aversion, and it is quite plausible that an individual might be willing to take chances with their money but not their health. A recent study by Dohmen et al. (2005) sheds some light on this issue using the 2004 wave of the German Socioeconomic Panel. The survey asks approximately 22,000 individuals several different types of risk questions. Respondents are asked the same type of questions about gambles over lifetime income used in the NLSY79, but they are also asked about their willingness to take chances in five different domains: financial matters, career, health, car driving, and sports and leisure. The study finds that, while average willingness to take risks is different across domains, there is a strong correlation across domains. Overall, there is evidence that a single risk parameter is relevant for all domains to some extent. The authors argue that their findings may indicate some "malleability" of risk preferences but more probably are indicative of differences in how individuals perceive risk across domains.

8. See, for example, Cooney and Hogan (1991).

from now on be referred to as "very strongly risk averse"; 46% of respondents fall into this category. Respondents who answered "yes" to both questions will be called "weakly risk averse" and 25% fall into this category. Respondents who answered "no" to the first question but "yes" to the second will be called "strongly risk averse," and this applies to 12% of respondents. Those who answered "yes" to the first question and "no" to the second will be referred to as "moderately risk averse," which applies to the remaining 17% of the respondents. This distribution of risk preferences is consistent with that found in previous studies, in which slightly more than a third to slightly more than one half of individuals fall into the most risk averse category.

The responses of individuals are viewed as resulting from an expected utility calculation. If U is the individual's utility function and I the lifetime income or "permanent consumption" in Barsky et al.'s terminology, then an expected utility maximizer will accept the 50–50 gamble of doubling lifetime income rather than cutting it by the fraction $1 - \alpha$ if the following holds:

$$\frac{1}{2}U(2I) + \frac{1}{2}U(\alpha I) \geq U(I). \tag{9}$$

In other words, the expected utility of the gamble is at least as great as the utility from having current income for certain. Note that the labels assigned to the categories correspond to varying degrees of risk aversion since the NLSY79 gambles are more than actuarially fair (the expected values are always greater than I):

$$\text{EI Gamble1} = \frac{1}{2}(2I) + \frac{1}{2}(\frac{2}{3}I) = \frac{4}{3}I \tag{10}$$

$$\text{EI Gamble2} = \frac{1}{2}(2I) + \frac{1}{2}(\frac{4}{5}I) = \frac{7}{5}I \tag{11}$$

$$\text{EI Gamble3} = \frac{1}{2}(2I) + \frac{1}{2}(\frac{1}{2}I) = \frac{5}{4}I. \tag{12}$$

Therefore, a risk neutral agent would accept any of the three gambles. As I have labeled the categories, only a "weakly risk averse" individual would accept all the lotteries.

An advantage to using this risk measure is that respondents are asked to gamble over family income, and respondents are asked to consider that family income is own income. Therefore, if the respondent is not the main breadwinner in the family, the survey design attempts to eliminate the potential problem that the respondent would be more or less likely to gamble with the spouse's income. Of course, there are valid criticisms and potential sources of noise in attempting to measure risk attitudes through experiments and hypothetical questions. For example, some respondents may not understand the questions but nonetheless answer them. In addition, respondents may value their job for more than pecuniary reasons and so be hesitant to leave it for a large expected increase in income. Moreover, perhaps their responses do not match what their decisions would be in reality.[9]

A disadvantage of this particular data set is that respondents are not asked these questions in an earlier year. When the risk questions are first asked, more than 50% of respondents have been or are married, which presents possible endogeneity problems. Marital decisions could certainly have an impact on risk attitudes.[10] However, the NLSY79 did repeat these questions in 2002, which proves useful in the empirical estimation for making a case that endogeneity cannot explain all of the findings. In 2002, 54% of respondents are considered "very strongly risk averse," 12% are "strongly risk averse," 16% are "moderately risk averse," and 18% are "weakly risk averse." While a similar percentage of respondents fall into the middle two categories in 2002 as in 1993, there has been an overall shift toward risk aversion. It is not surprising that fewer respondents are willing to take big risks in 2002 since respondents are almost 10 yr older, have more children, and face more responsibility in general.

The following descriptive statistics focus on the 1993 risk measures since they avoid more

9. However, Binswanger (1981), Camerer and Hogarth (1999), and Dohmen et al. (2005) find that hypothetical experiments are not at a serious disadvantage to games with real financial rewards.

10. Dohmen et al. (2006), using a German panel data set, find positive correlation of risk attitudes between spouses. This positive correlation is present when couples are first married and does not rise much until retirement age, suggesting that similarities in risk preferences are due in large part to positive assortative mating and not socialization.

endogeneity problems than do the 2002 risk measures. In addition, only 7,224 respondents were available to answer the risk questions in 2002, compared to more than 9,000 in 1993. Table 1 presents the distribution of risk aversion by demographic characteristics. Women are relatively more risk averse than men, with 49% being "very strongly risk averse" to the men's 43%. As expected, a higher percentage of men are "weakly risk averse," with 29% compared to women's 21%. In addition, even within the age group of 28–36, the young tend to be more risk tolerant. It is encouraging that these data reveal the above two patterns with respect to sex and age, as they corroborate the findings of past studies.

Table 1 also reveals that respondents with children in the house are more risk averse in general, although those with children aged 6–13 are the most risk averse among parents. The distribution of risk aversion is similar for all races, with whites slightly less "weakly risk averse." Respondents with less than a high school education are more polarized than the general population, with a comparatively large percentage falling into the "very strongly risk averse" and "weakly risk averse" categories. High school graduates are more risk averse than the general population, while college graduates and those who have attended graduate school are less risk averse, with a higher percentage falling into the middle two categories of risk aversion.

Table 2, which is critical to exploring the relationship between marriage and risk aversion, presents the distribution of risk aversion by age at first marriage. There is a clear trend between age at first marriage and risk category. For the total population, the percentage of "very strongly risk averse" respondents never increases and almost always decreases with age at first marriage, and the percentage of "weakly risk averse" respondents never decreases and almost always increases with age at first marriage. When the same analysis is carried out by sex, the trends remain almost as strong for both sexes. For women, the only exception is the 21–25 yr age group, at which

TABLE 1
Distribution of Risk Aversion in 1993 by Characteristics (%)

	Very Strongly Risk Averse	Strongly Risk Averse	Moderately Risk Averse	Weakly Risk Averse	Observations
Total population	46	12	17	25	9,008
Sex					
Men	43	11	17	29	4,462
Women	49	13	17	21	4,546
Age (yr)					
28–30	44	12	18	27	3,274
31–33	47	12	17	24	3,566
34–36	48	12	16	24	2,168
Education					
Less than high school	46	8	16	30	1,303
High school	49	11	16	24	3,915
Some college	45	13	18	24	2,086
College graduate	41	15	19	25	1,059
Graduate school	41	18	18	23	644
Race					
White	46	13	18	23	4,528
Black	47	10	15	28	2,720
Hispanic	46	11	16	27	1,760
Kids					
No kids in HH	41	11	17	30	3,510
Kids less than 6 in HH	48	13	17	22	3,479
Kids 6–13 yr in HH	51	11	16	21	1,802
Kids 14 yr and older in HH	50	10	16	25	214

HH, household.

TABLE 2
Distribution of Risk Aversion by Age at First Marriage (%)

Age at First Marriage (yr)	Very Strongly Risk Averse	Strongly Risk Averse	Moderately Risk Averse	Weakly Risk Averse	Observations
All					
Less than 21	52	11	16	21	2,092
21–24	49	13	17	21	2,340
25–29	43	14	18	25	1,619
30+	41	13	18	29	1,055
Never married	41	10	16	34	1,723
Women					
Less than 21	53	11	16	20	1,435
21–24	50	16	18	17	1,145
25–29	46	17	16	21	695
30+	45	13	17	26	443
Never married	45	11	17	27	729
Men					
Less than 21	47	11	16	25	657
21–24	49	10	16	24	1,195
25–29	42	12	19	27	924
30+	38	12	19	31	612
Never married	38	9	15	38	994

point the percentage of "weakly risk averse" individuals falls before increasing for the subsequent age group. For men, the same age group is the exception, where the percentage of "weakly risk averse" individuals falls temporarily and the percentage of "very strongly risk averse" increases temporarily. Figure 1 presents similar information graphically via a cumulative density function by age at first marriage. Age at marriage is measured in months since turned 16, and the cumulative share of respondents married is presented for each month by risk preference group. A smaller proportion of people in the least risk averse risk group ever marry, and a smaller proportion is married at almost all ages. While a larger share of people in the most risk averse group are married at ages less than 200 mo from age 16, after that age the proportion married of those in the "strongly risk averse" group overtakes the proportion married of those in the most risk averse group. Nevertheless, this figure also shows a strong relationship between risk preferences and age at first marriage.

B. Empirical Specification

I estimate a hazard model to investigate the determinants of time to first marriage. Survival analysis is appropriate for the questions at hand for at least two reasons. First, it is necessary to substitute for the normality assumption that ordinary least squares requires since assuming normality of time to an event is problematic. Second, right-censored spells (those individuals who never get married during the timeframe of the data) should be included in the analysis in order to fully use the information contained in the data. Hazard models handle both right-censored spells and time-varying covariates fairly easily. I use the semi-parametric Cox proportional hazards model because no assumption is made about the underlying shape of the baseline hazard. Under proportional hazards, the hazard rate into marriage for person j at time t is:

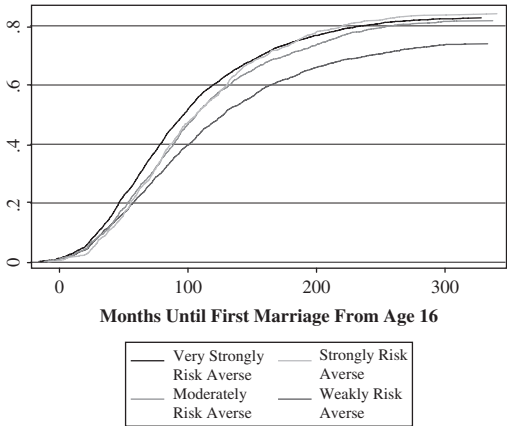
$$h_j(t) = h_0(t)e^{X_j(t)\beta}, \tag{13}$$

where $h_0(t)$ is the baseline hazard faced by everyone at time t. The estimated coefficients (βs) on the explanatory variables (Xs) shift the hazard rate up or down, depending on their signs.

In the jargon of survival analysis, "failure" in this analysis means a first marriage occurs. I assume individuals become "at risk" to fail at age 16.[11] While respondents are not legally

11. Results are not substantively different when I assume individuals first become "at risk" at age 18.

FIGURE 1
Cumulative Density Function of Age at First Marriage by Risk Preference Group



adults at this age, they gain a certain measure of independence since, at the time, 16 was the youngest age at which individuals could marry without parental consent in most states. On a more practical note, several hundred respondents get married before the age of 18, but only about 60 are married prior to age 16. Analysis time t is thus measured in months from turning age 16, and the failure time is marked by the number of months that elapse until first marriage.

The empirical specification includes dummy variables for the risk categories, excluding the "weakly risk averse" category. Other explanatory variables include years of education (and years of education squared), the log of the respondent's weekly real income, and dummy variables for sex (male; female is the base group), race (white and black; other is the base group), the age of respondent's children in the household (no children and children less than 6; children over 6 is the base group), region (south, west, and northeast; north central is the base group), whether the current residence is urban or rural, whether respondents are currently living with their parents, whether respondents lived with both biological parents until age 18, and whether respondents are currently enrolled in school. Explanatory variables are collected annually for respondents and every 2 yr starting in 1994. The empirical estimation of a hazard model with time-varying covariates requires the assumption that the explanatory variables remain constant between respondent interviews. This is clearly an oversimplification, but, as Wooldridge (2002) points out, researchers cannot get very far empirically without this assumption.

The hazard model specified in Equation (13) assumes that there is no unobserved heterogeneity in the probability of transition to first marriage. It is likely, however, that unobserved family-specific traits, such as attitudes about marriage and age at marriage, affect time to first marriage. Moreover, it is possible that the unobserved heterogeneity is correlated with one or more of the covariates. If this is the case, parameters estimated via the typical proportional hazards model will be biased, as the hazard framework usually assumes that any unobserved heterogeneity is uncorrelated with the covariates. Family-specific unobserved heterogeneity may be correlated with our covariates of interest, the risk attitude variables. Depending on when risk attitudes form, parental attitudes about risk may be transferred to children to a certain extent. For this reason, I also estimate a model with family fixed effects by exploiting the availability of sibling data in the NLSY79. The hazard rate becomes

$$h_{jk}(t) = h_0(t)\mathrm{e}^{X_{jk}(t)\beta+\delta_k} \tag{14}$$

for sibling j in family k, where δ_k represents the unobserved family heterogeneity.

IV. RESULTS

Table 3 presents the results of two Cox proportional hazards estimations. First, I present estimates of the proportional hazards model in Equation (13) for the full sample interviewed in 1993, assuming no unobserved heterogeneity (Specification 1). Second, I present estimates of the same proportional hazards model for the full sample with standard errors adjusted to allow for possible correlation within families (Specification 2). This specification also stratifies on variables that fail the proportional hazards test at the 1% level of significance. This means that a separate baseline hazard is estimated for the stratified variables, which are sex, race, region of residence, whether or not the respondent is enrolled in school, and whether or not they live in an urban location. In other words, for example, I do not constrain the hazard function for

TABLE 3
Survival Analysis of Time to First Marriage (Cox Proportional Hazards Model Using 1993 Risk Measure)

	Basic Model (Specification 1)				Stratified Model with Clustered Standard Errors (Specification 2)			
Variable	Coefficient	Hazard Ratio	z	$p > \|z\|$	Coefficient	Hazard Ratio	z	$p > \|z\|$
Very strongly risk averse	0.269	1.31	7.46	0.000	0.270	1.31	7.46	0.000
Strongly risk averse	0.233	1.26	4.82	0.000	0.236	1.27	4.98	0.000
Moderately risk averse	0.171	1.19	3.82	0.000	0.182	1.20	4.03	0.000
White	0.095	1.10	2.28	0.023				
Black	−0.525	0.59	−11.06	0.000				
Male	−0.239	0.79	−8.02	0.000				
Education	−0.126	0.88	−3.17	0.002	−0.067	0.94	−1.57	0.116
Education squared	0.006	1.01	4.05	0.000	0.004	1.00	2.23	0.026
No kids in HH	0.041	1.04	0.48	0.630	−0.127	0.88	−1.38	0.169
Kids less than 6 in HH	0.196	1.22	2.16	0.031	0.056	1.06	0.58	0.563
Urban	−0.159	0.85	−4.20	0.000				
Log weekly real income	0.150	1.16	16.70	0.000	0.1501	1.16	15.55	0.000
Enrolled in school	−0.488	0.61	−11.49	0.000				
Lived with parents until 18	0.046	1.05	1.50	0.135	0.058	1.06	1.82	0.068
Northeast	−0.174	0.84	−3.98	0.000				
South	0.126	1.13	3.32	0.001				
West	0.000	1.00	−0.01	0.992				
Live with parents now	−0.166	0.85	−5.31	0.000	−0.192	0.83	−5.94	0.000

HH, household.

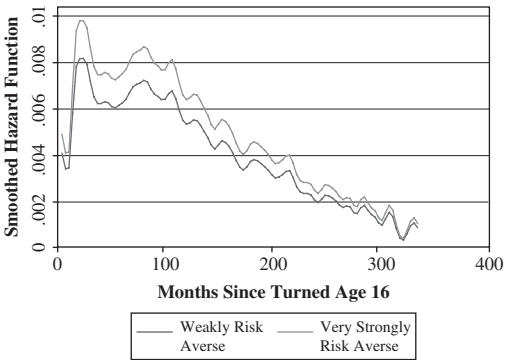
males to be a proportional replica of the hazard function for females. As a result, no coefficients can be estimated for variables that fail to meet the proportional hazards assumption. Fortunately, the risk attitudes variables do satisfy the proportional hazards assumption.

The results indicate risk preferences do matter. A Wald test shows that all the coefficients on the risk preference variables are significant at the 1% level. Relative to the "weakly risk averse," being in any other risk category shifts the hazard up and increases the conditional probability of marriage. The signs of the coefficients indicate which direction the hazard shifts (up for positive and down for negative). Their magnitudes are difficult to interpret until their exponential is taken to yield hazard ratios. The hazard ratios are presented for ease of interpretation. The hazard ratios for Specification 1 tell us that someone who is "very strongly risk averse" faces a hazard rate that is 1.31 times (or 31% greater than) the hazard faced by someone who is "weakly risk averse," while someone who is "moderately risk averse" faces a hazard rate that is 1.19 times the hazard faced by the "weakly risk averse." The hazard ratios for Specification 2 are very similar.[12] Figure 2 compares the estimated hazards for the "weakly risk averse" and "very strongly risk averse" groups. The shape of the hazard is not surprising; it increases sharply at first and almost monotonically decreases thereafter. After about 75 mo of analysis time (months since age 16), the hazard exhibits consistent duration dependence in the sense that the longer a respondent remains single, the lower the conditional probability of marriage. Moreover, the hazard for the "very strongly risk averse" lies above that for the "weakly risk averse" at all analysis times.

Most of the other explanatory variables in Specification 1 shift the hazard in the expected direction. For example, being male shifts the hazard down since, in any given interval, the conditional probability of marriage is lower for men. In the NLSY79, men marry

12. These results are quite robust to estimating the hazard models separately by education and race.

FIGURE 2
Cox Proportional Hazards Regression



an average of 2 yr later than women. Living in an urban area or in the northeast decreases the conditional probability of marriage. While there may be a larger selection of mates in urban areas, there are also a larger variety of activities than in rural areas and perhaps less traditional views about marriage and family. Conversely, living in the south increases the probability of marriage. Being enrolled in school and currently living with parents also decrease the hazard rate. Having lived with both parents until age 18 increases the hazard rate, but this coefficient is not statistically significant at the 10% level. Income increases the hazard rate, and educational attainment decreases it at first. Surprisingly, after about the high school level of educational attainment, education begins to increase the hazard. This unexpected result could be due in part to reverse causality, where marriage decisions cause educational outcomes. The hazard ratios for the variables remain very similar under Specification 2, with the one exception that having no children in the household now reduces the hazard rate. This seems to capture demand-side behavior more than in Specification 1 since single women with no children have no need for a father figure.

Reverse causality is a potential problem, where getting married or the length of time one has been married can affect one's risk aversion. Although the ideal situation would involve the risk questions being asked before any marriages occur, it could also be helpful to perform the survival analysis only for marriages that occur after the 1993 questions are asked. Unfortunately, this is problematic because the respondents are already aged 28–36 in 1993 and only a few hundred respondents are married after 1993. In fact, the frequency of first marriages peaks almost a decade before 1993. Nevertheless, the hazard analysis performed on the sample limited to those who marry after 1993 yields the expected sign for all risk categories. Results are presented in Table A1. While the estimated coefficients are not statistically significant, the fact that being "very strongly risk averse" increases the hazard rate the most relative to the "weakly risk averse" category is encouraging.

To support the idea that at least some element of risk attitudes is intrinsic, I have repeated the Cox hazards estimation using the risk preference variables for 2002. The results are presented in Table A2. The signs of the risk variable coefficients and the pattern of the hazard ratios are the same as in Specification 1 in Table 3, which uses the 1993 risk variables. The estimated coefficients are statistically significant at the 5% level, which is less significant than in Specification 1. It is encouraging that the results hold up fairly well when using a risk measure that is collected almost 10 yr after the first measure. Also, perhaps most importantly, the hazard ratios are smaller in magnitude when the 2002 risk measures are used than when the 1993 measures are used. If reverse causality was a problem in that the longer an individual is married, the more risk averse he or she becomes, then we would expect to see hazard ratios of a larger magnitude when the 2002 variables are used.

I also take advantage of the 2002 risk preference questions by analyzing how major life changes such as having children and getting married or divorced affect how one's risk attitudes change between 1993 and 2002. If reverse causality exists, so that getting married or time since marriage increases risk aversion, then we would expect to find that getting married after the 1993 risk attitudes questions were asked but before the 2002 questions were asked would have some impact on whether someone becomes more risk averse. Table A3 presents a probit estimation, where the dependent variable indicates whether the individual has become more risk averse between 1993 and 2002. The first explanatory variable is a dummy variable indicating whether the respondent had their first child between 1993 and 2002, after answering the risk attitudes questions in 1993. The other variables

represent changes in marital status and the timing of those changes. The second and third variables are dummy variables indicating whether the respondent was married or divorced for the first time after answering the 1993 risk attitudes questions but prior to answering the 2002 risk attitudes questions. Finally, the last two dummy variables indicate whether the respondent was married or divorced for the first time prior to 1993. The coefficient on whether the respondent had children is significantly different from zero at the 1% level, indicating that having children increases the probability of becoming more risk averse by a fairly small amount, approximately .045. Once the probability of becoming more risk averse is conditioned upon having children, none of the coefficients on the marriage or divorce variables are significant at anything less than the 14% level. While the effect of getting married between 1993 and 2002 is positive, the effect of getting married prior to 1993 is negative, supporting my previous results that being married for a longer period of time does not equate to becoming more risk averse.[13]

The above results support a robust relationship between risk preferences and timing of first marriage; nevertheless, causality cannot be assumed. It may be that unobserved heterogeneity in families explains the results, but the NLSY79 can be used to shed some of this doubt. A useful feature of the NLSY79 is its inclusion of multiple-respondent households. In 1979, more than 46% of the total sample consisted of siblings in 2,448 households. Table 4 presents the estimation of the basic hazard rate in Equation (13) for the sample of siblings interviewed in 1993 (Specification 3). The hazard ratios for the risk preference variables are extremely similar as in the full sample. Table 4 also presents estimates of the model in Equation (14) for the sample of siblings interviewed in 1993, allowing for fixed unobserved heterogeneity at the family level (Specification 4). The results indicate that unobserved heterogeneity at the family level cannot explain the results found in the cross section regarding the effect of risk attitudes on time to marriage. The statistical significance of the risk variables remains comparable to previous results. In addition, the effect of risk preference on time to marriage is actually magnified once fixed effects are included. For example, once fixed heterogeneity is taken into account, the "very strongly risk averse" face a hazard 75% greater than the "weakly risk averse" compared to a hazard 34% greater when fixed effects are excluded. Finding that the basic results are upheld when family fixed effects are included makes a causal interpretation of the effect of risk attitudes on marriage more plausible.

A. Supply-Side or Demand-Side Behavior?

Table 5 presents the basic hazard estimation separately for the two sexes and reveals an interesting difference. While the signs on the coefficients of the risk variables remain the same as for estimation on the whole sample, the hazard ratios suggest that the effect of risk preference on time to marriage is magnified for men for the "very strongly risk averse" and the "weakly risk averse." Moreover, the statistical significance of these two risk categories is much greater for men.[14] Overall, the results suggest that risk preferences matter more for men than women when it comes to the timing of marriage. On first consideration, these results might seem surprising for a number of reasons, among them that a ticking biological clock might result in more risk averse women marrying sooner. A possible explanation of the differential results between the sexes observed here is that demand-side behavior, in addition to supply-side behavior, is reflected in the estimates. On the supply side, the more risk averse may marry sooner because of the uncertainty of future prospects. On the demand side, women may view risk aversion as a desirable trait in a mate because risk averse men may exhibit more responsible behavior, financially and otherwise, than their more risk-loving counterparts. Risk aversion signals that a potential husband will not take unnecessary risks and will therefore be a good provider or partner.

Risk aversion should also have some bearing on whom an individual marries, not only when they marry. If the basic job search model holds, then the risk averse respondents will not only marry sooner than their more risk-loving

13. These general conclusions are valid when the probit equation is estimated separately for the sexes.

14. The same pattern is observed when the Cox proportional hazards estimation is performed separately for the sexes using the 2002 risk preference variables. Results are available upon request.

TABLE 4
Survival Analysis of Time to First Marriage for Siblings (Cox Proportional Hazards Model Using 1993 Risk Measure)

	Basic Model (Specification 3)				Basic Model with Sibling Fixed Effects (Specification 4)			
Variable	Coefficient	Hazard Ratio	z	$p > \|z\|$	Coefficient	Hazard Ratio	z	$p > \|z\|$
Very strongly risk averse	0.293	1.34	6.11	0.000	0.561	1.75	6.69	0.000
Strongly risk averse	0.207	1.23	3.18	0.001	0.400	1.49	3.59	0.000
Moderately risk averse	0.181	1.20	2.98	0.003	0.399	1.49	3.88	0.000
White	0.057	1.06	1.03	0.301				
Black	−0.549	0.58	−8.58	0.000				
Male	−0.279	0.76	−7.00	0.000	−0.641	0.53	−9.06	0.000
Education	−0.024	0.98	−0.41	0.682	−0.148	0.86	−1.26	0.207
Education squared	0.002	1.00	1.05	0.296	0.009	1.01	2.08	0.037
No kids in HH	0.219	1.25	1.84	0.067	0.537	1.71	3.55	0.000
Kids less than 6 in HH	0.353	1.42	2.77	0.006	0.598	1.82	4.20	0.000
Urban	−0.141	0.87	−2.73	0.006	0.125	1.13	1.37	0.172
Log weekly real income	0.150	1.16	12.26	0.000	0.163	1.18	10.29	0.000
Enrolled in school	−0.481	0.62	−8.44	0.000	−0.495	0.61	−7.34	0.000
Lived with parents until 18	0.061	1.06	1.41	0.157	−0.004	1.00	−0.03	0.974
Northeast	−0.108	0.90	−1.86	0.063	−0.038	0.96	−0.17	0.861
South	0.147	1.16	2.88	0.004	0.518	1.68	3.07	0.002
West	0.040	1.04	0.67	0.504	0.271	1.31	1.54	0.124
Live with parents now	−0.149	0.86	−3.56	0.000	−0.194	0.82	−3.73	0.000

Note: Estimated coefficients for the family fixed effects are not presented here but are available upon request. HH, household.

counterparts but also will settle for a lower reservation quality level. Thus, their spouses should have less desirable characteristics than the spouses of more risk-loving respondents. On the other hand, on the demand side, if risk aversion is a trait that women find desirable in men, then risk averse men may have other desirable traits as well. Spousal characteristics are limited in the NLSY79, but Table 6 presents the majority of spousal characteristics of married respondents by risk category. Table 6A presents the spousal characteristics for the two most extreme categories of respondent risk aversion, while Table 6B compares the spousal characteristics of the most risk averse respondents to the spousal characteristics of all other respondents. The spouses of married "very strongly risk averse" men are of lower "quality" (education, income, hours worked, fraction that work, and fraction of weeks worked) than the spouses of all other married men. The differences are significant at the 5% level for education, income, and hours worked. The spouses of "very strongly risk averse" men are also of lower quality than the spouses of "weakly risk averse" men in all but two cases, where quality is equal. However, the differences are only significant for the income variable. The education variable may be the most relevant measure of quality in this situation since the labor supply variables for wives are partly determined by household preferences over the wife's allocation of time.[15] However, these results may also be evidence that risk aversion is a signal of being a good provider since the more risk averse men match up with women who work less. Overall, these basic descriptive statistics support the predictions of a basic marriage search model in which the risk averse individual accepts a lower reservation quality and therefore

15. Measuring spousal quality in itself is problematic, and these measures are not completely exogenous. However, it should be noted that these spousal characteristics are measured in the year of or the year after the marriage took place. Thus, education levels would be close to exogenous, and the other quality variables would be more so than if they were measured well into the marriage.

TABLE 5
Survival Analysis of Time to First Marriage by Gender (Cox Proportional Hazards Model Using 1993 Risk Measure)

	Men (Specification 5)				Women (Specification 6)			
Variable	**Coefficient**	**Hazard Ratio**	z	$p > \|z\|$	**Coefficient**	**Hazard Ratio**	z	$p > \|z\|$
Very strongly risk averse	0.382	1.47	7.80	0.000	0.169	1.18	3.17	0.002
Strongly risk averse	0.278	1.32	4.00	0.000	0.173	1.19	2.53	0.011
Moderately risk averse	0.247	1.28	4.06	0.000	0.096	1.10	1.45	0.148
White	0.079	1.08	1.35	0.178	0.118	1.13	1.99	0.047
Black	−0.530	0.59	−7.95	0.000	−0.517	0.60	−7.58	0.000
Education	−0.205	0.81	−3.73	0.000	−0.045	0.96	−0.73	0.464
Education squared	0.009	1.01	4.39	0.000	0.003	1.00	1.42	0.155
No kids in HH	−0.151	0.86	−0.83	0.408	−0.023	0.98	−0.22	0.822
Kids less than 6 in HH	0.191	1.21	0.96	0.338	0.040	1.04	0.38	0.702
Urban	−0.226	0.80	−4.33	0.000	−0.101	0.90	−1.82	0.069
Log weekly real income	0.201	1.22	13.91	0.000	0.110	1.12	9.14	0.000
Enrolled in school	−0.484	0.62	−7.37	0.000	−0.497	0.61	−8.86	0.000
Lived with parents until 18	0.013	1.01	0.30	0.768	0.071	1.07	1.59	0.111
Northeast	−0.187	0.83	−3.00	0.003	−0.172	0.84	−2.79	0.005
South	0.222	1.25	4.19	0.000	0.048	1.05	0.88	0.380
West	−0.033	0.97	−0.52	0.603	0.033	1.03	0.53	0.596
Live with parents now	−0.244	0.78	−5.46	0.000	−0.069	0.93	−1.57	0.117

HH, household.

marries earlier. When comparing the spousal characteristics of women by risk aversion, the results are only slightly more mixed. The spouses of married ''very strongly risk averse'' women are not consistently of lower quality than the spouses of married ''weakly risk averse'' women. The incomes and years of education are significantly lower for spouses of the most risk averse women. However, husbands fare better in other categories, although only the difference in the fraction of husbands that work is statistically significant. When comparing the husbands of the most risk averse women and all other women, lower spouse quality is observed for the most risk averse women in all but two cases. Thus, the differences observed here across genders are slight. Perhaps the search model of marriage is also very relevant for women, but the search model alone is not adequate to explain the relationship between their risk aversion and time to marriage.

The results in this article are consistent with the findings of related research in economics as well as other fields such as evolutionary psychology. In the field of economics, Hamermesh and Biddle (1994) find that success in the marriage market, as measured by spouse's education and potential earnings ability, is reduced for below average looking women, but not for men. Gould and Paserman (2003) find that women search longer for a spouse in cities where men's wage inequality is higher. In this case, increased income inequality increases the value to women of holding out for a better offer. These results seem to indicate that men value physical attractiveness more than women, whereas women value other measures of quality, such as financial resources. This is perhaps related to why the spouse quality of the more risk averse women is not consistently lower than that of the more risk-loving women.

Evolutionary psychologists would, for the most part, agree. They argue that mating behavior observed today is rooted in strategies that were necessary many thousands of years ago. Male desires for children and their ability to produce many without cost to their health had them searching for short-term relationships with young and attractive females, where female youth and attractiveness represented fertility and health. On the other hand, women sought companions with the resources

TABLE 6
Spousal Characteristics of Married Respondents by Risk Attitudes

(A) By two most extreme categories of risk aversion, in year of marriage or year immediately following marriage

	Married Men		Married Women	
	Weakly Risk Averse	Very Strongly Risk Averse	Weakly Risk Averse	Very Strongly Risk Averse
Fraction that work	0.78	0.78	0.94*	0.95*
Hours worked	35.27	34.65	42.14	42.37
Income	14,515*	13,069*	23,864*	22,295*
Education	12.57	12.46	12.65**	12.39**
Fraction of weeks worked in year	0.67	0.67	0.87	0.88

(B) By most risk averse category and all others, in year of marriage or year immediately following marriage

	Married Men		Married Women	
	All Other	Very Strongly Risk Averse	All Other	Very Strongly Risk Averse
Fraction that work	0.80	0.78	0.95	0.95
Hours worked	35.49**	34.65**	42.44	42.37
Income	14,970**	13,069**	24,644***	22,295***
Education	12.67**	12.46**	12.89***	12.39***
Fraction of weeks worked in year	0.69	0.67	0.88	0.88

***, **, and * indicate, for a one-tailed test, differences in the means are significantly greater or less than 0 at the 1%, 5%, and 10% levels, respectively.

to provide for herself and her offspring (Klein 2006). In a 1980s study of dozens of cultures and thousands of individuals, Buss (1994) finds that women value financial resources twice as much as men, and this demand for men with resources exists even when women are financially independent. Wilke et al. (2006) find that women's perceived riskiness of activities in various domains (ethics, investment, gambling, and health) is negatively correlated with the attractiveness of men participating in those activities. Norman P. Li, assistant professor of psychology at the University of Texas, points out that, in practice, the characteristics of one's mate are related to what one has to offer. Extremely intelligent and successful women may have a harder time finding partners because ''men want somebody intelligent enough so that they can recognize the man's brilliance, but not necessarily enough to challenge them—or so smart that they find someone else more interesting'' (Klein 2006, 60). This could be related to why very risk averse men in the current study marry women with lower quality compared to more risk-loving men, who may be willing to take a chance with the intelligent women.

V. CONCLUSIONS

Understanding the role that risk preferences play in influencing behavior is important since risk attitudes likely play a central role in all kinds of decision making. While this need to understand the relationship between individual variation in risk attitudes and behavior is widely acknowledged, limited empirical studies exist that undertake the task. The current study attempts to contribute to this relatively sparse literature.

The initial theoretical motivation is a basic search model inspired by job search. The model predicts that the more risk averse searcher's penchant for a certain outcome results in a lower reservation quality compared to their more risk-loving counterparts, and thus they enter into marriage sooner. In addition, the benefit of pooling risk may also entice the risk averse into marriage sooner. The initial empirical results, including within-family analyses, support this basic prediction.

Further inspection of the data suggests that risk preferences affect marital decisions differentially between the sexes. Risk attitudes seem to have a larger and more statistically significant effect on time to marriage for men than for women. This leads to the hypothesis that demand-side behavior, not only supply-side behavior, may be reflected in the empirical results. Women may view high levels of risk aversion as a desirable characteristic, so that a potential mate's quality increases with risk aversion. Since the basic search model predicts that the risk averse have a lower reservation quality level than other searchers, one might expect the characteristics of their spouses to be less desirable than the spousal characteristics of the more risk loving. Some basic descriptive statistics support this prediction for spouses of men and, to a lesser degree, spouses of women.

This article expands upon our understanding of what motivates individuals to get married and how these decisions might affect larger trends observed in society. Studying individual marriage decisions has broader implications for assortative mating and equilibrium in the marriage market. For example, in recent decades, the average age at first marriage has been on the rise for the population as a whole, as has the fraction of people cohabiting. There are likely many factors that have contributed to this, but can changes in attitudes toward risk partially explain these phenomena? Also, in equilibrium, search theory predicts that the more risk averse will marry the more risk averse at an earlier age, while the risk lovers will be more likely to marry each other later in life. A theory of risk pooling has different implications for assortative mating. What do we observe empirically, and what are the implications for the quality of the match and hence divorce rates? These questions could be answered with more extensive data than are available in the NLSY79.

APPENDIX

Proposition: Given $F(q)$, if $U_A(q) = G[U_B(q)]$ for all q, then $\bar{q}_A < \bar{q}_B$.

Proof:[16] Let B's optimal strategy be to reject all offers $q < \bar{q}_B$ and accept otherwise. Let W_B denote the random payoff that results from following this strategy. Similarly, let A's optimal strategy be to reject all offers $q < \bar{q}_A$ and accept otherwise, and let W_A denote the random payoff resulting from this strategy. Now it must be determined if q_B is an acceptable offer to a type A searcher. Per the above notation, the following holds:

$$(A1) \qquad U_A(\bar{q}_B) = G[U_B(\bar{q}_B)] = G[EU_B(W_B)].$$

Since W_B is associated with B's optimal strategy, searcher B is worse off when following A's strategy, so

$$(A2) \quad G[EU_B(W_B)] > G[EU_B(W_A)] \equiv G[U_B(E(W_A) - r_{B,W_A})],$$

where r_{B,W_A} is the risk premium B would pay to avoid the random payoff W_A. Since A's risk premium is larger than B's,

$$(A3) \quad G[U_B(E(W_A) - r_{B,W_A})] > G[U_B(E(W_A) - r_A)] \equiv U_A(\bar{q}_A).$$

Thus,

$$(A4) \qquad U_A(\bar{q}_B) > U_A(\bar{q}_A), \text{ so } \bar{q}_B > \bar{q}_A.$$

In other words, any quality level that type B is willing to accept is also acceptable to the type A searcher, so A's reservation quality is less than B's.

16. As presented by Vesterlund (1997) in the context of job search.

TABLE A1

Survival Analysis of Time to First Marriage for Marriages Occurring after 1993 (Cox Proportional Hazards Model Using 1993 Risk Measure)

Variable	Coefficient	Hazard Ratio	z	$p > \|z\|$
Very strongly risk averse	0.113	1.12	1.22	0.224
Strongly risk averse	0.042	1.04	0.32	0.752
Moderately risk averse	0.070	1.07	0.62	0.534
White	−0.055	0.95	−0.44	0.658
Black	−0.274	0.76	−2.11	0.035
Male	0.183	1.20	2.09	0.037
Education	−0.077	0.93	−0.68	0.498
Education squared	0.004	1.00	1.01	0.312
No kids in HH	−0.337	0.71	−2.48	0.013
Kids less than 6 in HH	0.043	1.04	0.29	0.773
Urban	−0.133	0.88	−1.20	0.228
Log weekly real income	0.043	1.04	2.09	0.037
Enrolled in school	0.033	1.03	0.21	0.831
Lived with parents until 18	−0.058	0.94	−0.71	0.475
Northeast	−0.047	0.95	−0.40	0.691
South	0.152	1.16	1.51	0.131
West	0.137	1.15	1.12	0.262
Live with parents now	−0.228	0.80	−2.04	0.042

HH, household.

TABLE A2

Survival Analysis of Time to First Marriage (Cox Proportional Hazards Model Using 2002 Risk Measure)

Variable	Coefficient	Hazard Ratio	z	$p > \|z\|$
Very strongly risk averse	0.166	1.18	3.90	0.000
Strongly risk averse	0.126	1.13	2.25	0.024
Moderately risk averse	0.105	1.11	2.00	0.045
White	0.062	1.06	1.37	0.170
Black	−0.547	0.58	−10.69	0.000
Male	−0.227	0.80	−7.11	0.000
Education	−0.087	0.92	−1.97	0.048
Education squared	0.005	1.00	2.81	0.005
No kids in HH	0.029	1.03	0.33	0.744
Kids less than 6 in HH	0.183	1.20	1.90	0.057
Urban	−0.130	0.88	−3.22	0.001
Log weekly real income	0.152	1.16	15.72	0.000
Enrolled in school	−0.479	0.62	−10.58	0.000
Lived with parents until 18	0.034	1.03	1.02	0.306
Northeast	−0.174	0.84	−3.71	0.000
South	0.141	1.15	3.50	0.000
West	−0.012	0.99	−0.25	0.805
Live with parents now	−0.189	0.83	−5.61	0.000

HH, household.

TABLE A3

Probit Estimation Predicting Likelihood of Becoming More Risk Averse (between 1993 and 2002)

Variable	Coefficient	z	$p > \|z\|$	Marginal Effect
Had children between 1993 and 2002	0.1204	2.57	0.01	0.0449
Married between 1993 and 2002	0.0825	1.34	0.18	0.0306
Divorced between 1993 and 2002	−0.0198	−0.42	0.68	−0.0072
Married before 1993	−0.0625	−1.47	0.14	−0.0230
Divorced before 1993	0.0127	0.30	0.76	0.0047
Intercept	−0.3897	−11.13	0.00	

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