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Risk Preferences and the Timing of Marriage and Childbearing

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RISK PREFERENCES AND THE TIMING OF MARRIAGE AND CHILDBEARING*

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The existing literature on marriage and fertility decisions pays little attention to the roles played by risk preferences and uncertainty. However, given uncertainty regarding the availability of suitable marriage partners, the ability to contracept, and the ability to conceive, women's risk preferences might be expected to play an important role in marriage and fertility timing decisions. By using data from the Panel Study of Income Dynamics (PSID), I find that measured risk preferences have a significant effect on the timing of both marriage and fertility. Highly risk-tolerant women are more likely to delay marriage, consistent with either a search model of marriage or a risk-pooling explanation. In addition, risk preferences affect fertility timing in a way that differs by marital status and education, and that varies over the life cycle. Greater tolerance for risk leads to earlier births at young ages, consistent with these women being less likely to contracept effectively. In addition, as the subgroup of college-educated, unmarried women nears the end of their fertile periods, highly risk-tolerant women are likely to delay childbearing relative to their more risk-averse counterparts and are therefore less likely to become mothers. These findings may have broader implications for both individual and societal well-being.

Although extensive, the literature on marriage and fertility decisions has paid little attention to the effect of risk preferences and uncertainty on the timing of these decisions. Models generally assume that women are risk neutral and that fertility can be perfectly controlled.[1] However, when considerable uncertainty exists regarding the availability of suitable marriage partners, the ability to contracept, and the ability to conceive, women's risk preferences might be expected to play an important role in marriage and fertility timing decisions.

Social scientists have long been interested in individuals' attitudes toward risk and the effect that these attitudes have on decision making and behavior. This interest has led to the inclusion of experimental questions in surveys that are designed to provide information about individuals' risk preferences. Such questions generally create measures of risk preferences by eliciting willingness to take a series of gambles over lifetime income; Barsky et al. (1997) described these measures in the Health and Retirement Study (HRS), and the same questions have been asked in the Panel Study of Income Dynamics (PSID). Such questions have also been used extensively in the literature on savings and wealth (see, e.g., Brown 2001; Charles and Hurst 2003; Lusardi 1998; and Shroder 2001).

More controversial is the idea that these measures of risk preferences may capture a more general risk-taking propensity that could apply to nonfinancial behavior. Psychologists have long debated whether risk taking is an innate and stable personality trait, or whether it is context specific. Earlier psychology literature argued that behavior is completely situationally determined (Mischel 1968). More recent work by Hudson, Coble, and

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1. See Heckman and Willis (1976) and Michael and Willis (1976) for early exceptions.

Lusk (2005:48) argued that "risk is multidimensional, and that no single measure is likely to effectively capture risk preferences in a manner that lends itself to applied research."

However, if such a general risk-taking propensity exists, it would be expected to affect behavior in many different contexts, including marriage and fertility timing decisions. In this paper, I test whether heterogeneity of risk preferences, as measured by differences in the willingness to gamble over lifetime income, can help to explain differences in marriage timing and fertility timing for women.[2]

Using data from the PSID (see Hill 1992), I find that measured risk preferences have a significant effect on the timing of both marriage and fertility. Highly risk-tolerant women are more likely to delay marriage, consistent with either a search model of marriage or a risk-pooling explanation. In addition, risk preferences play a role in fertility timing that differs by marital status and education and that varies significantly over the life cycle. Among both unmarried and married women, greater tolerance for risk leads to earlier births at young ages, consistent with these women being less likely to contracept effectively. In addition, as the subgroup of college-educated, unmarried women nears the end of their fertile periods, those women who have a high tolerance for risk are likely to delay childbearing relative to their more risk-averse counterparts, and are therefore less likely to become mothers. This significant link between experimental measures of preference parameters and demographic decisions provides external validity of these survey measures of risk preferences and suggests that they may be more broadly applicable beyond the realm of financial decision making.

In addition, these findings on the timing of marriage and fertility decisions may have broader implications for both individuals and societies. First marriages to very young women are more likely to lead to divorce. First births to very young women are often associated with negative infant health outcomes, as well as problems with both physical and cognitive development. Risk preferences may, therefore, have very real effects on well-being.

HOW MIGHT RISK PREFERENCES AFFECT MARRIAGE AND FERTILITY TIMING?

Marriage Timing

Different theories would have different predictions regarding the effects of risk tolerance on marriage timing. First, economists have often looked at the marriage timing decision within a search-theoretic framework (e.g., Becker 1974; Becker, Landes, and Michael 1977; Loughran 2002; Schmidt 2007). In one-sided search models of marriage, individuals search over a distribution of potential mates for marriage partners. These search models explicitly incorporate uncertainty. Although the distribution of potential mates is known with certainty, the offer drawn from the distribution in any given time period is not. Searchers are generally assumed to be risk neutral; and marriage, once entered into, is often assumed to be permanent. When heterogeneity of risk preferences is introduced into these models, individuals who are more risk tolerant will have a higher reservation value of an acceptable marriage partner. They will therefore be less likely to find an acceptable mate and will have, *ceteris paribus*, an older age at first marriage.[3] An alternate explanation that provides the

2. The correlation between these measured risk preferences and demographic behavior may not be as tenuous as it first seems. In an evolutionary framework, systematic differences in risk preferences by sex have been attributed to differences in returns to investments in reproductive success. "For females, the low-risk steady-return investment in parenting effort often yields the highest returns, whereas for males, the higher-risk investment in mating effort produces a higher expected payoff" (Eckel and Grossman 2002:282).

3. Heterogeneity of risk preferences has been introduced into job-search models that are analogous to the marriage-search models. In a job-search model, individuals who are more risk tolerant will have a higher reservation wage and therefore a longer expected duration of unemployment (e.g., Feinberg 1977; Pissarides 1974).

same predictions is risk pooling. If individuals view marriage as a way to self-insure against income risks, individuals who are more risk tolerant would marry later.[4]

However, theories of marriage also predict the opposite effect of risk tolerance. For example, when divorce probabilities are high, individuals who are the least risk tolerant may *delay* marriage in hopes of finding a better match—one that will decrease the probability of divorce. In this case, risk tolerance would hasten marriage. In addition, the "economic provider" hypothesis suggests that because men have historically been the chief financial providers within marriage, decreases in real wages may lead to delays in marriage timing (Cooney and Hogan 1991; Oppenheimer, Kalmijn, and Lim 1997). If those who are the least tolerant of risk prefer to have a larger cushion of savings before marrying, one would expect to see a negative relationship between risk tolerance and age at first marriage: that is, people who were highly risk tolerant would marry sooner.[5]

Finally, risk preferences could also affect marriage timing through a "marriage attraction" effect. Assortative mating might occur on risk preferences and other personality traits. Risk tolerance could then either delay or hasten first-marriage timing, depending upon the distribution of risk preferences in the population.

In sum, the direction of the predicted effect of risk tolerance on marriage timing is ambiguous. Standard search models and risk-pooling explanations predict that risk tolerance would delay marriage. Explanations associated with match quality and divorce, or the economic-provider hypothesis, would work in the opposite direction, predicting that risk tolerance would hasten marriage. The marriage attraction effect caused by sorting on risk preferences could go in either direction. Because the theoretical effects are ambiguous, it is ultimately an empirical question. Later in this paper, I test for the effects of risk preferences on marriage timing.

Fertility Timing

With imperfect fertility control, a woman deciding on fertility timing must consider three costs.[6] First, as in models with perfect fertility control, she incurs the cost of lost lifetime earnings from bearing a child, which is a function of the woman's wage, human capital investment, and age.[7] Women who face an increasing earnings profile or whose careers require up-front investment in human capital will minimize these costs by choosing to bear children later in life. Women with a relatively flat earnings profile will choose to bear children earlier in life. Furthermore, these costs fall as the woman ages.

However, because fertility is a stochastic process, the timing of the first birth cannot be chosen with certainty. Uncertainty exists regarding the ability to prevent unwanted pregnancies as well as the ability to conceive when desired. The relevant decision is not really "when to bear a child," but instead "when to stop trying to prevent pregnancy and begin trying to conceive."

The second cost that the woman incurs is associated with the necessity of preventing early, unplanned pregnancies. Fertility can be controlled through the choice of a particular contraceptive technique. Monetary costs depend upon the technique chosen. In addition,

4. See the literature on the added worker effect in the United States (e.g., Cullen and Gruber 2000; Stephens 2002) and an extensive literature showing that family-based income transfers contribute to consumption smoothing in developing countries (e.g., Foster and Rosenzweig 2001; Rosenzweig 1988; Rosenzweig and Stark 1989).

5. The economic-provider mechanism is usually associated with men's decisions about marriage timing. The focus of this paper is women's decisions about marriage timing, but the two are closely linked.

6. The existing literature on fertility decisions usually assumes perfect fertility control and risk neutrality and has often focused on completed family size rather than fertility timing (see Hotz, Klerman, and Willis [1997] for a recent review).

7. Both an emerging theoretical literature (e.g., Caucutt, Guner, and Knowles 2002; Conesa 1999; Mullin and Wang 2002) and empirical evidence (e.g., Amuedo-Dorantes and Kimmel 2005; Blackburn, Bloom, and Neumark 1993; Miller 2005) suggest that women can minimize career-related costs associated with motherhood by delaying fertility timing.

there are nonmonetary costs incurred as well, including forgone time, sexual pleasure, religious principles, and health (see Michael and Willis 1976). These costs are assumed to be constant over the woman's life cycle.

Finally, assuming that the benefits of motherhood are positive and sufficiently high that most women want to bear a child before the end of their fertile period, a third cost results from the possibility that a woman will be unable to give birth before her fertile period ends and thus will forgo the benefits of motherhood. Because effective fecundability declines with age (see Weinstein et al. 1990), longer delay of childbearing increases the probability of fertility problems, therefore reducing the probability of an eventual conception. The expected value of this cost increases with age.

Figure 1 shows how these costs might look over the life cycle. The loss of lifetime earnings from having a child at a given age decreases as the woman delays childbearing and ages. The expected value of the loss of motherhood increases as a woman delays child-bearing and ages. If the cost of contraception is constant over time, the result is a U-shaped pattern of costs over the childbearing years.

For less-educated women, the costs of early childbearing in terms of forgone wages are low. Therefore, as predicted by the models under perfect fertility control, childbearing should take place early in life. This means that the remaining two costs should also be less important. The need to contracept effectively is lower. In addition, because births occur early in life, the constraint imposed by the "biological clock" is less likely to be binding. However, for more-educated women, the costs of an early, unplanned pregnancy are high in terms of lost lifetime income. They would, therefore, choose to delay childbearing in a context of perfect fertility control. By definition, delay requires effective contraception (or abstinence) in early years. In later years, as the likelihood of fertility problems increase, the potential costs of permanent childlessness become increasingly important.

These costs imply that women's risk preferences will affect fertility timing through two mechanisms and that the relative importance of these two mechanisms will vary over the life cycle. First, women who are highly risk tolerant may be more willing to sustain high risks of an unplanned pregnancy and therefore contracept less effectively.[8] If this were the case, higher levels of risk tolerance would be associated with earlier childbearing. Because the costs of an unplanned pregnancy are highest early in life, during that period, those with the least tolerance for risk should be most likely to use effective contraception and therefore delay births.

Second, those individuals who are more tolerant of risk might be less worried about the risk of infertility and therefore might delay childbearing longer. This would imply that risk tolerance would be associated with delayed births. Because the risks of unintended childlessness increase as women age, this mechanism should be more important closer to the constraint imposed by the biological clock.

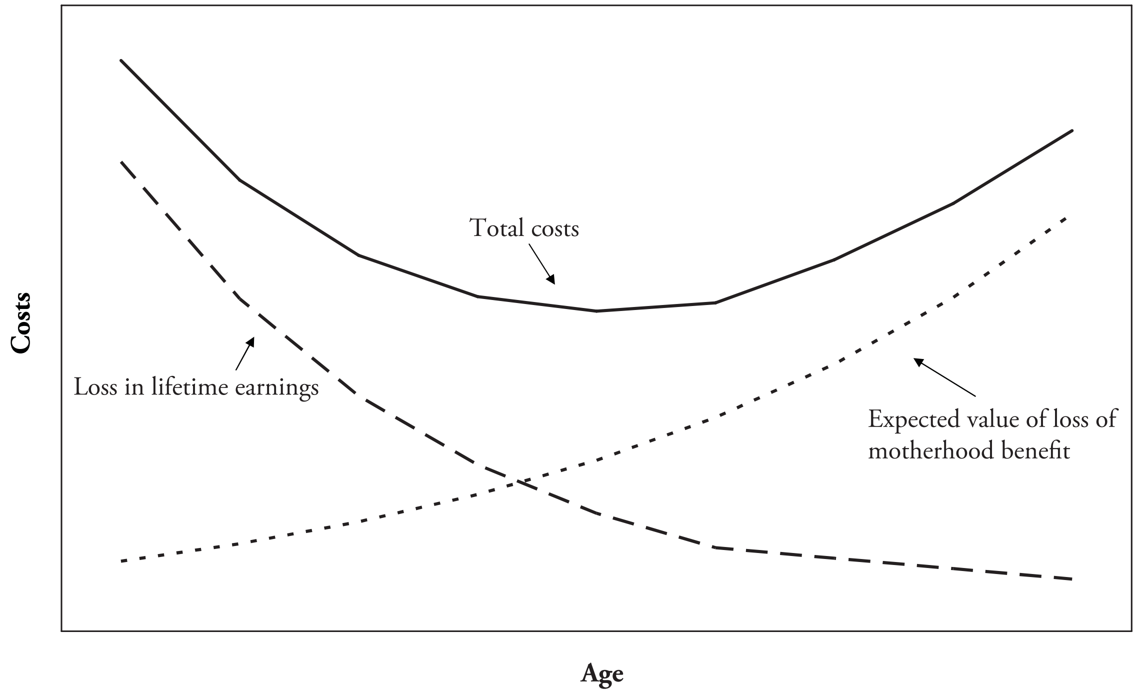
DATA

The data used in this paper come from the PSID (see Hill 1992). The PSID began with a national sample of approximately 5,000 U.S. households in 1968. Since then, the PSID has attempted to follow all individuals from those households, including children of the original respondents as they begin their own families. Questions on demographics and employment information are asked of all respondents in each year of the survey.[9] In addition, family history files are available that can be merged to the main data files. These files contain detailed retrospective marriage and fertility histories of all individuals living

8. Another possibility is that risk tolerance is associated with early sexual activity or multiple sexual partners. Lundberg, Romich, and Tsang (2007) found evidence in the data on children of the National Longitudinal Survey of Youth that risk attitudes are predictive of sexual activity at early ages. This possibility could also lead to an increased chance of unplanned pregnancy and would reinforce the effects described herein.

9. For a detailed description of the PSID, see Brown, Duncan, and Stafford (1996).

Figure 1. Costs Over the Life Cycle



in a PSID family in any wave, beginning with 1985. These histories provide information such as age at first marriage, age at first birth, and whether the first birth to an individual occurred within or outside of marriage.

In 1996, questions regarding hypothetical gambles over lifetime income were added to the PSID interview. These questions are similar to questions asked of respondents in the Health and Retirement Study (HRS), described by Barsky et al. (1997). Employed respondents were first asked the following:

> Now, imagine that you have a job that guaranteed you income for life equal to your current, total income. And that job was your family's only source of income. Then, you are given the opportunity to take a new, and equally good, job, with a 50-50 chance that it will double your income and spending power. But there is a 50-50 chance that it will cut your income and spending power by a third. Would you take the new job?"

Depending on the response to this question, PSID respondents are asked a series of similar questions with different percentage income losses. Based on the responses to these questions, individuals can be arranged into ranges based on risk tolerance (the reciprocal of risk aversion). Those ranges are then converted into a risk-tolerance index that corrects for measurement error using Barsky et al.'s (1997) methodology. Estimates of relative risk tolerance range from 0.15 to 0.57 (corresponding to levels of risk aversion of 6.67 to 1.75), and 51% of the women in the sample fall into the least risk-tolerant category.[10] These measures are merged with individual and family data from 1968 to 2003, and with detailed retrospective

10. Individuals in the most risk tolerant of the four categories would accept a gamble with a 50% chance of doubling lifetime income and a 50% chance of losing half of lifetime income. Individuals in the least risk tolerant of the four categories would refuse a gamble with a 50% chance of doubling lifetime income and a 50% chance

Table 1. Means of Sample Characteristics, by Educational Attainment

Variable	All Women	High School Dropouts	High School Graduates	College Graduates
Risk Tolerance	0.276	0.256	0.274	0.295
	(0.157)	(0.156)	(0.155)	(0.162)
Marital Status	0.684	0.530	0.685	0.777
Birth	0.429	0.469	0.438	0.377
Father's Occupation Was Professional/Managerial	0.140	0.046	0.109	0.294
Black	0.311	0.445	0.329	0.169
Hispanic	0.039	0.051	0.038	0.032
Jewish	0.022	0.005	0.011	0.067
Protestant	0.691	0.787	0.701	0.597
Catholic	0.208	0.136	0.210	0.247
Urban	0.679	0.592	0.677	0.743
Number of Observations	4,373	605	2,838	930

Source: Panel Study of Income Dynamics (PSID).

Notes: Standard deviations are in parentheses.

marriage and fertility histories. Table 1 presents means of sample characteristics for the full sample of 4,373 women, as well as separately by educational attainment.[11]

Table 2 presents means of sample characteristics separately for women with the lowest level of risk tolerance versus women with higher levels of risk tolerance. The first two columns show that these two groups of women differ along a number of demographic characteristics. Women with the lowest levels of risk tolerance are more likely to be black or Protestant, as well as less likely to be Catholic or to have a father in a managerial or professional occupation. However, no statistically significant differences by risk tolerance exist in the unadjusted means for either marital status or for the probability of ever having given birth.

One concern is that the risk questions in the PSID are asked only of the respondent; they are not asked of all household members. More than 90% of the unmarried women at each educational level responded to the survey. For married women, however, approximately one-half of the women in each educational category did not answer the risk questions themselves. I address this issue in greater detail later in this paper.

An additional concern with this measure of risk tolerance is that the questions were asked in 1996, after most of the women in my sample had made their marital and fertility decisions. As long as risk preferences are stable and remain fairly constant over the life cycle, this will not create a problem. However, risk preferences possibly change as individuals age. More important, these changes could be endogenous to marriage or motherhood. I address this possibility later in this paper.

of losing one-fifth of lifetime income. For more discussion of the risk measures in the PSID, see Luoh and Stafford (1997).

11. These statistics are for the sample used in the regressions for birth timing. The sample includes women who were household heads or wives and who had no missing values for either the risk-tolerance measure or any of the other explanatory variables, including the year the woman was born, the year she first gave birth (for those women who bore children), and the year she first married (for those women who ever married). The sample for the regressions for marriage timing is slightly larger because some women with missing birth-timing information had valid information on marriage timing.

Table 2. Means of Sample Characteristics, by Risk Tolerance (RT) and Educational Attainment

	Full Sample		High School Dropouts		High School Graduates		College Graduates	
Variable	Lowest Level of RT	Other Levels of RT	Lowest Level of RT	Other Levels of RT	Lowest Level of RT	Other Levels of RT	Lowest Level of RT	Other Levels of RT
Marital Status	0.670	0.685	0.531	0.474	0.677	0.682	0.767	0.789
Birth	0.445	0.426	0.526	0.491	0.441	0.439	0.386	0.359
Father's Occupation Was Professional/Managerial	0.115**	0.166	0.051	0.038	0.095*	0.124	0.240**	0.337
Black	0.341**	0.279	0.437	0.457	0.345†	0.311	0.240**	0.111
Hispanic	0.035	0.043	0.046	0.060	0.032†	0.044	0.034	0.031
Jewish	0.019	0.025	0.008	0.000	0.014	0.008	0.046*	0.084
Protestant	0.722**	0.657	0.817*	0.739	0.718*	0.683	0.655**	0.550
Catholic	0.184**	0.234	0.113*	0.171	0.191**	0.231	0.221†	0.269
Urban	0.669	0.690	0.596	0.585	0.677	0.677	0.705*	0.774
High School Dropout	0.165**	0.110	—	—	—	—	—	—
High School Graduate	0.649	0.649	—	—	—	—	—	—
College Graduate	0.186**	0.241	—	—	—	—	—	—
Sample Size	2,245	2,128	371	234	1,457	1,381	417	513

Source: Panel Study of Income Dynamics (PSID).

Note: Means are statistically different at the following levels:

†$p < .10$; *$p < .05$; **$p < .01$

METHODOLOGY

I estimate two sets of discrete-time hazard models to separately examine the effect of risk preferences on marriage and fertility timing. The marriage (childbirth) hazard function $\lambda(j|\mathbf{X}_{it})$ is the probability that woman i in year t will marry (bear a child) at age j, conditional on being unmarried (childless) up until age j. More precisely (Eq. (1)),

$$\lambda(j|\mathbf{X}_{it}) = \frac{1}{1+\exp(-(\beta\mathbf{X}_{it} + \delta RT_i + \gamma_j))}. \tag{1}$$

The $\mathbf{X}$ vector includes individual-level characteristics, such as educational attainment, race, religion, region of residence, urban residence, and year-of-birth dummy variables to control for any cohort effects.[12] Duration dependence takes the form of a fourth-order polynomial in t.[13]

12. It is possible that risky behaviors, such as financial irresponsibility, smoking, and heavy drinking, are correlated with both measured risk preferences and marriage and fertility timing. Because these behaviors are endogenous, I do not include them in my main specification. However, all results are robust to inclusion of controls for these variables.

Also, in results not reported here, in the regressions for married women, I included spousal characteristics, such as spouse's age and educational attainment. The inclusion of these variables does not affect the results.

13. Results that allow duration dependence to be fully nonparametric, where each year at risk has it its own interval-specific dummy variable, do not differ qualitatively from the results presented here.

RT measures risk tolerance.[14] As I discussed earlier, the predicted effect of risk tolerance on marriage timing is ambiguous. *RT* will delay marriage if search or risk-pooling effects dominate. Conversely, it will hasten marriage if match quality or economic provider effects dominate. For the childbirth regressions, the expected sign of δ is unclear *a priori*. If risk-tolerant women are less likely to contracept and therefore have earlier first births, δ would be expected to be positive. If, instead, risk-tolerant women are more likely to postpone childbearing because they are more willing to gamble over the risk of infertility, the estimate of δ would be expected to be negative.

In addition, the effects of risk tolerance on fertility timing are expected to differ depending on whether the woman is early or late in her fertile period. Because of this, I also estimate a version of the childbirth hazard in which the risk-tolerance variable is interacted with a spline for age, allowing different effects of risk for women younger than 20, between 20 and 29, and 30 and older. The estimated coefficient on *RT* is predicted to be positive for the youngest women and negative as women near the end of their fertile period.

To the extent that marriage signals the beginning of a socially sanctioned period for childbearing, marriage timing should indirectly affect fertility timing as well. If risk tolerance leads to later marriages, it also should correspond to later first births. Because of this, in the empirical analysis of fertility timing, all models are run separately for married and unmarried women, and the models estimated for married women control for age at first marriage.

Finally, the risk measures used in this paper have been shown in previous literature to be correlated with wealth (e.g., Charles and Hurst 2003; Mazzocco 2004). One concern is that without adding controls for wealth, the risk measures may simply be proxies for wealth effects on marriage and fertility timing. At the individual level, wealth is clearly endogenously determined with marriage and fertility decisions, and its inclusion could induce bias. To address this issue, I use parental occupation (with an indicator for whether the woman's father was in a professional or managerial occupation) as a proxy for individual wealth. This variable should be correlated with an individual woman's wealth but not endogenously related to her marriage and fertility decisions.[15]

RESULTS

Marriage Timing

Estimates of the effect of risk tolerance on the timing of women's first marriages are presented in column 1 of Table 3. The demographic variables are, for the most part, statistically significant and in the expected direction. Women who pursue higher levels of education marry later, as do black women and women living in urban areas. Women who report their religious affiliation to be either Jewish or Protestant marry significantly earlier than those who report a non-Western religion, Catholicism, or no religion at all. Even after I control for a wide array of demographic variables, the estimated coefficient on risk tolerance is –0.595 and is statistically significant at the 1% level. The negative coefficient implies that those who have a greater tolerance for risk marry later in life,[16] consistent with dominant search model or risk-pooling effects on marriage timing. Figure 2 graphs the predicted survivor functions representing the probability that a woman is unmarried for at least *t* years.

14. I use the risk tolerance index created by Barsky et al. (1997) to correct for measurement error. However, results are robust to using categorical variables to measure risk tolerance. Results are available on author's Web site (http://lanfiles.williams.edu/~lschmidt/research.htm).

15. Results are robust to using alternate proxies for wealth, including father's education and indicators for whether the individual considered her family to be wealthy or poor while she was growing up. Results are available on author's Web site (http://lanfiles.williams.edu/~lschmidt/research.htm).

16. These results are consistent with work by Spivey (2007), who used the NLSY and found that measured risk aversion shortens the time to marriage for both men and women.

Table 3. Effects of Risk Tolerance on Hazard of First Marriage

Variable	All Women	High School Dropouts	High School Graduates	College Graduates
Risk Tolerance	–0.595**	–1.244†	–0.527*	–0.519
	(0.177)	(0.722)	(0.239)	(0.370)
High School Graduate	–0.609**	—	—	—
	(0.096)			
College Graduate	–1.244**	—	—	—
	(0.108)			
Father's Occupation Was Professional/Managerial	–0.097	0.150	–0.132	–0.121
	(0.080)	(0.442)	(0.119)	(0.131)
Black	–1.099**	–1.423**	–1.114**	–0.459*
	(0.094)	(0.253)	(0.120)	(0.218)
Hispanic	0.082	–0.275	0.292	–0.199
	(0.148)	(0.496)	(0.200)	(0.319)
Jewish	0.477**	0.485	0.355	0.578
	(0.176)	(0.865)	(0.288)	(0.264)
Protestant	0.280**	0.251	0.402**	0.292
	(0.096)	(0.381)	(0.133)	(0.186)
Catholic	0.077	0.064	0.136	0.035
	(0.103)	(0.408)	(0.142)	(0.203)
Urban	–0.250**	–0.386	–0.160†	–0.451**
	(0.065)	(0.222)	(0.086)	(0.144)
Incremental Pseudo-R^2	.0010	.0027	.0007	.0007
Sample Size	4,470	589	2,782	1,099

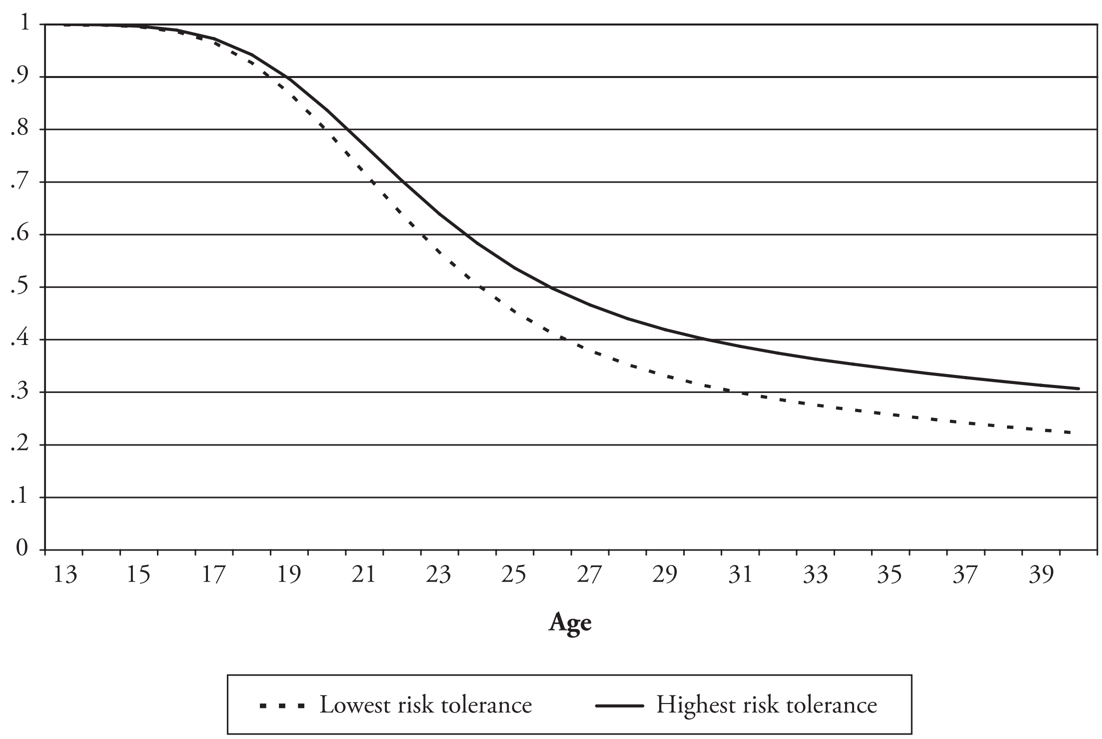
Notes: Standard errors are in parentheses. Regressions also control for region of residence and year-of-birth dummy variables. Duration dependence takes the form of a fourth-order polynomial in *t*. PSID core weights are used.

†$p < .10$; *$p < .05$; **$p < .01$

Predictions shown are for a white, college-educated woman born in 1970. The solid line in the graph indicates predictions for the highest level of risk tolerance in the sample, and the dashed line represents predictions for the lowest level of risk tolerance. The survivor functions presented in Figure 2 show graphically that risk tolerance delays marriage and that those who are more risk tolerant have a reduced probability of ever marrying.

Columns 2–4 of Table 3 show these results separately by educational attainment. For all three educational categories, the estimated coefficient is large and negative, although it is less precisely determined for college graduates than for the other groups. For high school dropouts, the coefficient is –1.244 and is significant at the 10% level. The magnitude of the coefficient implies that for a white woman who is a high school dropout and was born in 1970, moving from the lowest level of risk tolerance reported in the survey to the highest level would delay the median age at marriage by approximately 7 months (from 19 years and 10 months to 20 years and 5 months of age) and delay the 75th percentile age at marriage by 11 months (from 21 years and 11 months to 22 years and 10 months of age). For high school graduates, the coefficient is smaller in magnitude but statistically stronger, with an estimated coefficient of –0.527 that is statistically significant at the 5% level. For a white woman who has a high school education and was born in 1970, moving from the lowest level of risk tolerance in the survey to the highest level would delay the median age at marriage by 10 months (from 21 years and 5 months to 22 years and 3 months) and delay

Figure 2. Probability of Remaining Unmarried Until Age *t*: White, College-Educated[a] Woman Born in 1970



[a]Educational attainment was measured in 1996.

the 75th percentile age at marriage by 2 years and 2 months (from 24 years and 9 months to 26 years and 11 months of age).

Table 3 also presents the incremental pseudo-R^2 associated with adding the risk-tolerance measure to the regression, therefore providing some information on the additional amount of variation in marriage timing that can be explained by heterogeneity of risk preferences. Although the delays in marriage associated with higher risk tolerance discussed in the preceding paragraph show effects that are nonnegligible in magnitude, the additional amount of variation explained by adding the risk measure is quite small. The incremental pseudo-R^2 ranges from .0007 for the high school and college graduates to .0027 for the high school dropouts. The fact that the risk-tolerance measures (although statistically significant predictors of the outcome of interest) do not explain much of the remaining variation in outcomes is consistent with other work using these measures in the financial literature (e.g., Charles and Hurst 2003).

Fertility Timing

Table 4 presents results from duration analyses on age at first birth. I conduct these analyses separately for women who were married versus unmarried at the time of the first birth. Results for married women are presented in columns 1 and 2; column 1 presents results that do not control for age at first marriage. As the preceding section makes clear, risk preferences have an independent effect on marriage timing and might be expected to affect fertility timing through this mechanism. Thus, it is necessary to control for age at first marriage.

Table 4. Effects of Risk Tolerance on Hazard of First Birth

	Married Women		
Variable	No Controls for Age at Marriage	Controls for Age at Marriage	Unmarried Women
Risk Tolerance	–0.239	–0.068	0.040
	(0.201)	(0.203)	(0.388)
Age at Marriage	—	–0.084**	—
		(0.009)	
High School Graduate	–0.152	–0.061	–0.536**
	(0.094)	(0.096)	(0.129)
College Graduate	–0.307**	0.008	–1.871**
	(0.108)	(0.114)	(0.251)
Father's Occupation Was Professional/Managerial	–0.024	0.036	–0.025
	(0.083)	(0.083)	(0.222)
Black	–0.086	0.048	0.567**
	(0.121)	(0.122)	(0.144)
Hispanic	0.074	0.046	0.514*
	(0.164)	(0.166)	(0.258)
Jewish	0.206	0.061	–0.827
	(0.193)	(0.197)	(0.988)
Protestant	0.253*	0.130	0.127
	(0.124)	(0.124)	(0.168)
Catholic	0.177	0.145	–0.094
	(0.132)	(0.132)	(0.194)
Urban	–0.020	0.035	–0.115
	(0.068)	(0.068)	(0.134)
Incremental Pseudo-R^2	.0001	.0000	.0000
Sample Size	2,948	2,948	1,384

Notes: Standard errors are in parentheses. Regressions also control for region of residence and year-of-birth dummy variables. Duration dependence takes the form of a fourth-order polynomial in *t*. Educational attainment is measured as of 1996. PSID core weights are used.

$^{\dagger}p < .10$; $^{*}p < .05$; $^{**}p < .01$

The results in column 1 of Table 4 show that for married women, before I control for age at first marriage, education significantly affects fertility timing. Women with higher levels of education are more likely to delay their first birth. However as column 2 shows, this effect works entirely through the timing of marriage. After I control for age at first marriage, educational attainment has no independent effect on fertility timing.[17]

The effects of risk preferences tell a similar story. Before I control for age at first marriage, risk tolerance has a negative effect on fertility timing. The coefficient of –0.239, although not statistically different from zero, suggests that women who are more risk tolerant have their first births later than women who are relatively more risk averse. Column 2 (Table 4) shows that for married women, earlier age at first marriage (as expected) has a significant effect on hastening age at first birth. However, after I control for this factor,

17. In subsequent tables, I report only results from the specification in which I control for age at first marriage.

Table 5. Effects of Risk Tolerance on Hazard of First Birth With Age Interactions

	Married	Unmarried
Risk Tolerance × Younger Than 20	0.504	0.926*
	(0.372)	(0.456)
Risk Tolerance × Age 20–30	–0.348	–0.818
	(0.226)	(0.515)
Risk Tolerance × Older Than 30	0.530	–0.603
	(0.395)	(1.194)
Chi-square for Parameter Tests on Risk Variables		
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	5.20*	10.54**
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	4.45*	0.03
Variables jointly = 0 (*df* = 3)	8.46*	11.11*
Variables all equal (*df* = 2)	8.37*	10.94**
Incremental Pseudo-R^2	.0007	.0029
Sample Size	2,948	1,384

Notes: Standard errors are in parentheses. Regressions also control for region of residence and year-of-birth dummy variables. Duration dependence takes the form of a fourth-order polynomial in *t*. Educational attainment is measured as of 1996. PSID core weights are used.

$^{*}p < .05$; $^{**}p < .01$

risk tolerance has no independent effect on fertility timing: the estimate of δ is reduced to approximately one-third of its original magnitude.

Results presented in column 3 (Table 4) for unmarried women show the expected pattern for the demographic control variables. Unmarried women with higher levels of educational attainment delay their first births, and black and Hispanic unmarried women have their first births earlier. However, risk tolerance has no significant effect on fertility timing for unmarried women.

There are two competing theoretical effects of risk tolerance on fertility timing that should vary in relative importance by age. Early in the fertile period, risk tolerance is expected to *hasten* first-birth timing because risk-tolerant women will be less likely to contracept effectively. This should lead to an estimated coefficient that is positive. Late in the fertile period, risk tolerance is expected to *delay* first-birth timing because risk-tolerant women will be less concerned about the possible risk of childlessness. This should lead to an estimated coefficient that is negative. To test whether these differential effects of risk tolerance by age exist, I interact the risk-tolerance variable with a spline for age so that risk tolerance can have different effects on women younger than 20, between 20 and 29, and 30 and older. These results can be found in Table 5.

For both married and unmarried women, the results suggest that risk tolerance has a significant effect on fertility timing and that this effect differs by age. For both married and unmarried women, the hypotheses that the risk variables are jointly equal to zero and jointly equal to each other are each rejected by a chi-square test at the 5% level or better. The estimated coefficient on risk tolerance for married women younger than 20 is positive but not precisely estimated. This is consistent with the hypothesis that younger women with higher levels of risk tolerance are less likely to contracept effectively. However, the interaction with the older-than-30 age group is also positive, which is opposite in sign from what would be expected if the biological clock were playing a role.

For unmarried women, the effect of risk tolerance on women younger than 20 is positive and significant at the 5% level. In addition, it is significantly larger than the coefficients for the two older age groups. Again, this is consistent with the idea that women who are more risk tolerant engage in riskier sexual behavior and are more likely to bear children at earlier ages. However, as in the marriage regressions, the values of the incremental pseudo-R^2 suggest that the additional variation in first-birth timing explained by adding the risk measures is very small.

As explained previously, the differential results of risk tolerance by age should be most pronounced for women with steep earnings profiles. Highly educated women will be most likely to delay childbearing and therefore may be more likely to be influenced by the biological clock. Because of this, Table 6 presents regressions with age interactions for women by educational level. For married women at all three levels of education, the risk variables are not jointly statistically different from zero. For high school dropouts and college graduates, the coefficients for young women are large and positive, as would be expected: women who are more risk tolerant have earlier first births. For high school dropouts, the interaction between *RT* and younger than 20 approaches statistical significance at the 10% level (p value = .111); for college graduates, it is statistically significant at the 10% level.

For unmarried women, this positive effect on women younger than 20 is present for high school and college graduates. For high school graduates, it approaches statistical significance at the 10% level (p value = .103). Finally, at the other end of the fertility horizon, risk tolerance for those older than 30 plays a large role in delaying childbearing for unmarried, college-educated women. The coefficient on the risk variable for women older than 30 is –6.361 and is statistically significant at the 10% level.

Figures 3 and 4 graph the predicted survivor functions, which represent the probability that a woman is childless for at least t years. Predictions shown are for a white, college-educated woman born in 1970. The solid line in each graph indicates predictions for the highest level of risk tolerance in the sample, and the dashed line represents predictions for the lowest level of risk tolerance. The survivor functions shown in Figure 3 show that although the effect of risk tolerance hastens births at young ages, the magnitude of this effect is very small. Women who are less risk tolerant are slightly less likely to become mothers. However, after age at marriage is controlled for, risk preferences have very little effect on the fertility timing of married women.

For unmarried women, the effects illustrated in Figure 4 are larger (albeit on a much smaller base). Moving from the highest level of risk tolerance to the lowest level has three major effects. First, it delays childbearing at early ages. Second, it hastens the timing of the first birth from the age of 30 onward. Finally, it reduces the probability that the woman will remain permanently childless.

Among college-educated women, the stronger effects of risk preferences on the fertility timing of unmarried women relative to married women may seem surprising. However, these differences are consistent with theoretical predictions found in Caucutt et al. (2002) and Schmidt (2007). The models in each of these papers predict that high-productivity, single mothers should exhibit the longest delays in fertility timing. In these models, the fertility timing of married women is affected by both marriage and the finite nature of the biological clock. However, the fertility timing of unmarried women is primarily driven by the biological clock. Given the greater importance that the biological clock plays for unmarried, college-educated women, it is not surprising that risk tolerance has a stronger effect on their decisions later in life.

As mentioned earlier in this paper, the PSID risk questions are asked only of the respondent. Most unmarried women were the respondent in their households, so the results presented earlier are unaffected. However, as indicated by Table 7, which provides means of sample characteristics for married women by education and respondent status, a significant fraction of married women in each educational category did not answer the risk questions themselves. For these women, the risk-tolerance measures used in the previous

Table 6. Effects of Risk Tolerance on Hazard of First Birth With Age Interactions, by Educational Attainment

	Married	Unmarried
A. High School Dropouts		
Risk tolerance × Younger than 20	1.638	–0.009
	(1.028)	(0.885)
Risk tolerance × Age 20–30	–0.418	–4.338**
	(1.187)	(1.620)
Risk tolerance × Older than 30	1.209	–1.891
	(2.995)	(3.489)
Chi-square for parameter tests on risk variables		
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	3.90*	9.72**
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.31	0.44
Risk variables jointly = 0 (*df* = 3)	4.90	9.93*
Risk variables all equal (*df* = 2)	3.93	9.90**
Incremental pseudo-R^2	.0037	.0118
Sample size	315	284
B. High School Graduates		
Risk tolerance × Younger than 20	0.051	1.059
	(0.491)	(0.648)
Risk tolerance × Age 20–30	–0.433	–0.153
	(0.285)	(0.626)
Risk tolerance × Older than 30	0.056	1.166
	(0.654)	(1.265)
Chi-square for parameter tests on risk variables		
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	0.96	3.24†
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.54	1.03
Risk variables jointly = 0 (*df* = 3)	2.70	4.95
Risk variables all equal (*df* = 2)	1.32	3.90
Incremental pseudo-R^2	.0003	.0019
Sample size	1,916	893

(continued)

analysis are for their husbands. If risk preferences are highly correlated across spouses, using the respondent's risk tolerance as a family measure should not dramatically alter the results.[18]

18. In Wave 1 of the HRS (1992), of those primary respondents in the least risk-tolerant category, 70% had secondary respondents (usually their spouse or domestic partner) who were also in the least risk-tolerant category. This suggests that risk tolerance is correlated to some extent across spouses. However, married couples in the HRS are likely to have been married for many years, and therefore may not be representative of married couples in the PSID. In addition, research in psychology suggests that there are moderate positive and statistically significant

(Table 6, continued)

	Married	Unmarried
C. College Graduates		
Risk tolerance × Younger than 20	2.177† (1.301)	0.406 (1.915)
Risk tolerance × Age 20–30	0.259 (0.454)	0.263 (1.693)
Risk tolerance × Older than 30	0.080 (0.602)	–6.361† (3.724)
Chi-square for parameter tests on risk variables		
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	2.19	0.01
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.09	3.67†
Risk variables jointly = 0 (*df* = 3)	2.91	4.24
Risk variables all equal (*df* = 2)	2.43	4.22
Incremental pseudo-R^2	.0010	.0176
Sample size	717	207

Notes: Standard errors are in parentheses. Regressions also control for region of residence and year-of-birth dummy variables. Duration dependence takes the form of a fourth-order polynomial in *t*. Educational attainment is measured as of 1996. PSID core weights are used.

†$p < .10$; *$p < .05$; **$p < .01$

Figure 3. Probability of Remaining Childless Until Age *t*: Married White Woman Born in 1970

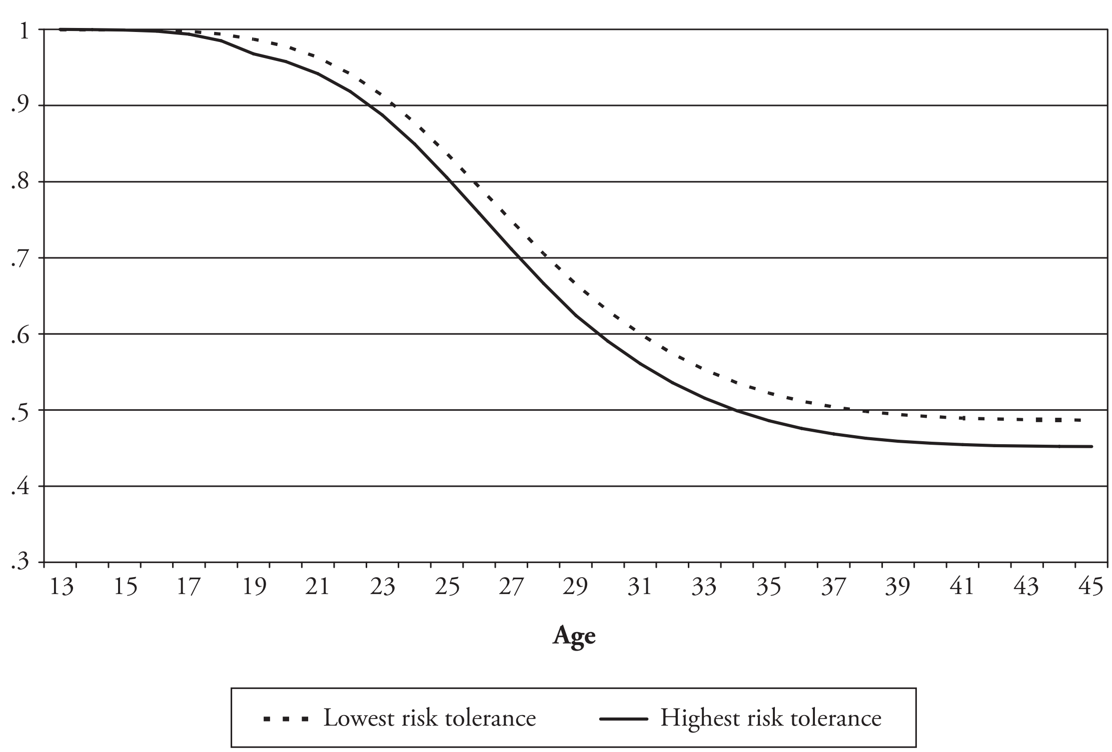


Figure 4. Probability of Remaining Childless Until Age *t*: Unmarried White Woman Born in 1970

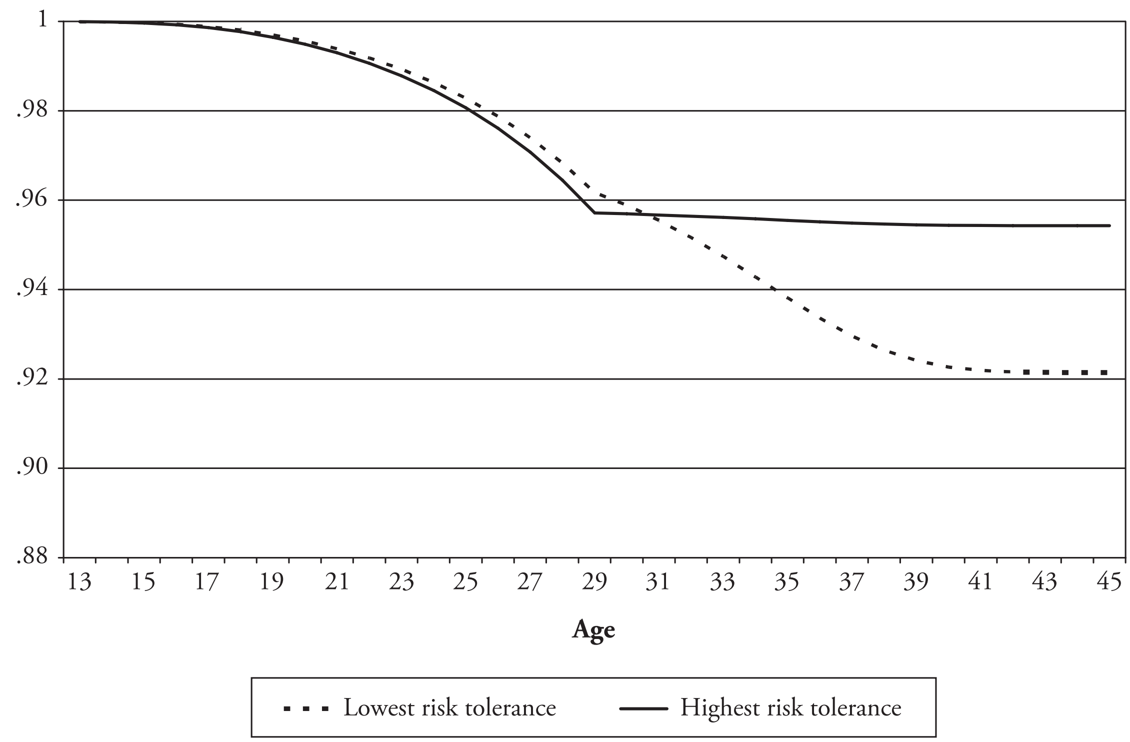


Table 7. Means of Sample Characteristics for Married Women, Respondents Versus Nonrespondents

	High School Dropouts		High School Graduates		College Graduates	
Variable	Respondents	Non-respondents	Respondents	Non-respondents	Respondents	Non-respondents
Risk Tolerance	0.250	0.244	0.262**	0.288	0.274**	0.319
Birth	0.554**	0.344	0.482**	0.411	0.506**	0.405
Father's Occupation Was Professional/Managerial	0.034†	0.084	0.097**	0.157	0.281	0.329
Black	0.309*	0.198	0.273**	0.151	0.177**	0.084
Hispanic	0.057	0.053	0.035	0.047	0.030	0.031
Jewish	0.006	0.008	0.014	0.014	0.051*	0.099
Protestant	0.766	0.779	0.697†	0.657	0.629*	0.543
Catholic	0.154	0.137	0.215*	0.261	0.216**	0.298
Urban	0.549	0.504	0.670	0.671	0.698*	0.778
Sample Size	180	135	1,010	906	332	385
Percentage Who Were Respondents	57.1		52.7		46.3	

Source: Panel Study of Income Dynamics (PSID).

Note: Means are statistically different at the following levels:

†$p < .10$; *$p < .05$; **$p < .01$

However, this is a potential concern because respondent status is likely to be correlated with other individual-level characteristics. Table 7 shows that married women who are respondents are more likely to be black and to have given birth are more likely to be Protestant and less likely to be Catholic, and have lower levels of risk tolerance. They are also less likely to have fathers who were in professional and managerial occupations. Because of these differences, in Table 8, I present results in which the married sample is further stratified into respondents and nonrespondents.

Column 1 (of Table 8) reprints the results for all married women from Table 6 for reference. Column 2 presents results for the women who were respondents (i.e., they answered the risk questions themselves), and column 3 presents results for those women who were not the respondents (i.e., someone else in the household—usually the spouse—answered the risk questions for them). When regressions are run only for those married women who answered the risk questions themselves, the hastening effect of risk tolerance on fertility timing of women younger than age 20 becomes stronger for all educational categories. The results in column 3 for nonrespondents show no effects of risk preferences on fertility timing at any level.

Ideally in duration analysis, the right-hand-side variables would be fully time-varying. However, because the marriage and fertility histories in the PSID are retrospective, I do not have a true panel data set. This problem affects the educational status variables, which are important for stratifying the sample.[19] To test the sensitivity of the results to the time at which educational attainment is measured, I have limited the sample to those individuals for whom I have data on educational attainment at the time of their marriage and fertility decisions. Results (not shown but available upon request) are robust to this alternate specification.[20]

The kinks in the survivor functions are a result of constraining the effect of risk tolerance to be the same for women in each of the three segments of the spline (younger than 20, 20–29, and 30 and older). However, these cut points for the age interactions are somewhat arbitrary. One might wonder whether different cut points affect the results. To look at whether the cut points matter, I ran regressions in which instead of defining the cut points at 20 and 30, I allowed for year-specific interactions with risk tolerance (essentially allowing risk to have a different effect in each year). Although these regressions have less power because of the reduction in degrees of freedom, they provide a useful picture of the pattern of risk and fertility timing. The predicted survivor functions provide evidence that the predicted patterns are not dependent upon the choice of cut points (results available from the author upon request).

correlations between spouses on sensation seeking in the range of .30–.40, which are similar in size to correlations found on attractiveness (see Bratko and Butković 2002; Glicksohn and Golan 2001).

19. This problem also affects region of residence and the measure of risk tolerance. Because of the importance of the risk-tolerance measure as my independent variable of interest, I address this separately later in this paper. Large regional differences exist in marriage and fertility timing that might capture the effects of other omitted variables. To proxy for these regional differences, I have run regressions with the 1993 value for region of residence, as well as regressions that control for the region of residence of the original PSID household in 1968. The results are not substantively affected by the choice of regional variable.

20. These results are similar to those found in Tables 8 and 9, with one exception. When I stratify by educational attainment at the time of the birth, I no longer have high school graduates who had their first birth at an age younger than 17. Likewise, I no longer have college graduates who had their first birth at an age younger than 21. By stratifying the sample in this way, each educational category contains only women who were successful at preventing unwanted pregnancies until they completed the educational level in question. As a result, the positive effect of risk tolerance at early ages is present for high school dropouts but becomes attenuated for women with higher levels of education.

Table 8. Effects of Risk Tolerance on Hazard of First Birth for Married Women, Respondents Versus Nonrespondents

	All Married Women	Respondents	Nonrespondents
A. High School Dropouts			
Risk tolerance × Younger than 20	1.638 (1.028)	2.292 (1.462)	–0.052 (2.530)
Risk tolerance × Age 20–30	–0.418 (1.187)	–0.491 (1.881)	–0.075 (2.501)
Risk tolerance × Older than 30	1.209 (2.995)	–6.167 (3.858)	3.840 (3.317)
Chi-square for parameter tests on risk variables			
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	3.90*	3.61†	0.00
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.31	2.67	2.21
Risk variables jointly = 0 (*df* = 3)	4.90	8.78*	2.40
Risk variables all equal (*df*= 2)	3.93	7.09*	2.39
Incremental pseudo-R^2	.0037	.0074	.0034
Sample size	315	180	135
B. High School Graduates			
Risk tolerance × Younger than 20	0.051 (0.491)	0.438 (0.592)	–0.429 (1.013)
Risk tolerance × Age 20–30	–0.433 (0.285)	–0.708† (0.379)	0.110 (0.489)
Risk tolerance × Older than 30	0.056 (0.654)	–0.989 (0.968)	1.443 (0.893)
Chi-square for parameter tests on risk variables			
Risk tolerance x Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	0.96	3.87*	0.30
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.54	0.09	2.04
Risk variables jointly = 0 (*df* = 3)	2.70	6.21	3.01
Risk variables all equal (*df* = 2)	1.32	4.16	2.59
Incremental pseudo-R^2	.0003	.0012	.0010
Sample size	1,916	1,010	906

(continued)

IS MEASURED RISK TOLERANCE ENDOGENOUS?

Ideally, questions aimed at quantifying risk tolerance would be asked in the PSID before the marriage and or fertility decisions were made. If measured risk tolerance reflects a stable personality trait, the timing of the risk questions relative to marriage and childbearing decisions will not bias my results. However, risk preferences possibly change endogenously with major life events, such as marriage or motherhood. If women become less tolerant of risk after marrying or having children, this reverse causality could bias my results: women who were more risk tolerant would show up as having later marriages and births when,

(Table 8, continued)

	All Married Women	Respondents	Nonrespondents
C. College Graduates			
Risk tolerance × Younger than 20	2.177†	3.193*	–2.340
	(1.301)	(1.489)	(2.714)
Risk tolerance × Age 20–30	0.259	0.336	–0.315
	(0.454)	(0.606)	(0.857)
Risk tolerance × Older than 30	0.080	0.813	–1.261
	(0.602)	(0.759)	(1.293)
Chi-square for parameter tests on risk variables			
Risk tolerance × Younger than 20 = Risk tolerance × Age 20–30 (*df* = 1)	2.19	3.50†	0.64
Risk tolerance × Age 20–30 = Risk tolerance × Older than 30 (*df* = 1)	0.09	0.39	0.71
Risk variables jointly = 0 (*df* = 3)	2.91	5.32	1.61
Risk variables all equal (*df* = 2)	2.43	3.61	1.38
Incremental pseudo-R^2	.0010	.0029	.0013
Sample size	717	332	385

Notes: Standard errors are in parentheses. Regressions also control for region of residence and year-of-birth dummy variables. Duration dependence takes the form of a fourth-order polynomial in *t*. Educational attainment is measured as of 1996. PSID core weights are used.

$^\dagger p < .10$; $^*p < .05$; $^{**}p < .01$

in fact, the lower levels of risk tolerance were caused by the transitions to marriage and motherhood and not vice versa.

Three main findings emerge from the results presented in the previous section. First, women who are more risk tolerant marry later; second, risk tolerance hastens first births early in the life cycle; and third, for unmarried, college-educated women, risk tolerance delays first births as women approach the end of their fertile period. The reverse causality argument in the preceding paragraph could potentially explain the results for marriage timing and the biological-clock fertility effect at the end of the fertile period. However, it would not explain the strongest fertility effect—that is, that risk tolerance hastens fertility timing for young women younger than 20. This suggests that reverse causality is not the only explanation for my results.

The risk questions were asked only once in the PSID, making it impossible to examine whether a given individual changes their response to the risk questions over time and to rule out such endogeneity. However, work by Charles and Hurst (2003), using these measures in the PSID, showed a correlation between the risk preferences of parents and the risk preferences of their children (and a strong correlation for those who are either very risk averse or very risk tolerant), which implied some stability of these preference measures over time.

In addition, the equivalent questions were asked on several occasions in the HRS.[21] Detailed analysis of the HRS risk questions by Sahm (2006) suggested that the questions measure stable and well-defined preferences. For example, she found that personal events that would reduce an individual's expected lifetime income (such as job displacement or diagnosis of a serious health condition) seem to have little impact on risk tolerance. However, she found a link between marriage and measured risk tolerance, but in the opposite

21. However, the HRS sample is made up of older individuals and thus may not be the best sample for comparison.

Table 9. Effect of Risk Tolerance on the Likelihood That a Woman Older Than 45 Ever Had a Birth

Variable	Coefficient	*SE*
Risk Tolerance	–0.028	0.070
Marital Status	0.199**	0.025
High School Graduate	–0.009	0.027
College Graduate	–0.070*	0.034
Father's Occupation Was Professional/Managerial	–0.022	0.035
Black	0.065*	0.027
Sample Size	2,289	

Notes: The dependent variable is an indicator for whether the woman ever had a birth. Coefficients are from linear probability model on a sample of those women older than 45. Regression also controls for Hispanic ethnicity, religious affiliation, and urban status.

$^{\dagger}p < .10$; $^{*}p < .05$; $^{**}p < .01$

direction of that suggested earlier: namely, that individuals entering a marriage show an increase in risk tolerance.[22]

As an additional test for the exogeneity of risk preferences to the childbearing decision, I examine the subsample of women who are likely to have completed their childbearing (women older than 45) in the PSID to see whether a relationship exists between ever having had a child and risk preferences. If risk preferences endogenously change with motherhood such that mothers are less tolerant of risk, one would expect that motherhood would be negatively and significantly correlated with risk tolerance. Table 9 shows results from the estimation of a linear probability model in which an indicator for whether the woman ever had a child is regressed on the *RT* measure, as well as on individual characteristics. This regression shows that no statistically significant relationship exists between measured risk tolerance and the likelihood of motherhood.

CONCLUSION

A large and growing literature examines the role that risk preferences play in influencing individual decision making, and experimental questions designed to measure such risk preferences have become popular additions to surveys. Despite skepticism over the existence of a general risk-taking propensity, this paper shows that the PSID's measure of risk preferences, determined by asking a series of questions about willingness to gamble over lifetime income, has predictive power in the nonfinancial context of demographic decisions.

Risk preferences are found to have a significant effect on marriage timing, with highly risk-tolerant women likely to delay marriage. In addition, risk preferences play a role in fertility timing that varies by age, marital status, and education. Among both unmarried and married women, greater tolerance for risk leads to earlier births at young ages, consistent with the notion that these women are less likely to contracept effectively. As college-educated unmarried women near the end of their fertile period, women who have a high tolerance for risk are likely to delay childbearing relative to their more risk-averse counterparts. These findings further validate the PSID risk measures and could have broader

22. Sahm (2006) also found that less risk-tolerant types are more likely to be consistently married in the panel, but this relates more directly to divorce than to marriage timing.

implications for both individual and societal well-being. Early marriages are more likely to end in divorce, and early first births are often associated with negative child outcomes. In addition, by affecting fertility timing, differences in risk preferences may lead to differences in the incidence of infertility problems and potential childlessness. Because of these effects, it is even more critical to understand the role that risk preferences play in these demographic decisions.

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