

Gender Differences in Personal Income and Financial Risk Tolerance: How Much of a Connection?

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Prior research indicates that relative to men, women generally have lower incomes and typically are more risk averse. In a sample of the clientele of financial planners, men had higher personal incomes and exhibited greater financial risk tolerance, which is consistent with previous studies. The authors' objective was to determine how much of the gender difference in income could be explained by risk tolerance. Results indicate that risk tolerance can explain some of the variation in earnings between women and men but that it is not a primary reason for the wage gap.

Risk exists in any decision in which an outcome is not fully guaranteed (i.e., 100% probable). Risk tolerance is the extent of one's willingness to pursue an uncertain course of action, offering a relatively large reward, over a more certain course of action, offering a relatively small reward (March & Shapira, 1987). In everyday language, risk tolerance is the willingness to "take a chance."

Generally, taking a greater chance holds out the promise of a greater reward, but it is accompanied by a correspondingly higher possibility of losing what is at stake. Various lines of research indicate that risk tolerance is a factor in the amount of remuneration an individual receives from her or his work (Bonin, Dohmen, Falk, Huffman, & Sunde, 2006; Brown, Farrell, Harris, & Sessions, 2006; Dohmen et al., 2005; Douglas & Shepherd, 2002; Graham, Cron, Gily, & Slocum, 2007; MacCrimmon & Wherung, 1990; Shaw, 1996).

It is well documented that women earn less than men (Böheim, Hofer, & Zulehner, 2005; Hartmann, Sorokina, & Williams, 2006); however, the causes of the wage gap are still hotly debated. The discrepancy has been attributed to differences in type of jobs, levels of education, college majors, and work experience. A significant portion of the gap, however, cannot be explained by these factors and could represent either an undervaluation of women's skills or outright discrimination (Böheim et al., 2005; Hounsell, Humphlett, & Lewis, 2002).

A gender difference favoring men on risk tolerance is also fairly well established (see meta-analysis by Byrnes, Miller, & Schaefer, 1999). Some

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researchers have implied that risk tolerance may account for some of the observed difference in incomes between men and women. For instance, Dohmen et al. (2005) reported that in Germany, approximately 33% of women work in the public sector compared with 21% of men, perhaps because the public sector jobs offer more job security, even though the pay is lower.

A more direct test of risk tolerance as a possible cause for the gender difference in wages was conducted by Dohmen and Falk (2006), who found that risk-averse workers preferred fixed payments (safe payoff), whereas risk-tolerant workers preferred variable pay (uncertain payoff). Even after controlling for productivity, Dohmen and Falk observed a marked gender difference in this preference. Overall, variable pay was preferred by 68% of the men and 44% of the women, with a difference in the same direction existing in all four productivity brackets. On a probit analysis, women were 24% less likely than men to elect a variable pay scheme when productivity was not controlled, and 15% less so after adjusting for productivity differences.

Dohmen and Falk's (2006) findings are intriguing but not definitive. Their results were based on two measures of risk tolerance: (a) choices involving a lottery with safe versus risky options and (b) a self-rating on an 11-point scale about "willingness to take risks, in general" (p. 10). The chief limitation in the Dohmen and Falk study is the method used to assess risk tolerance. On lottery questions, the results are often a function of the payoff options and response modes (Schoemaker, 1990), so answers to a single question may not be sufficient to assess a person's typical risk tolerance. Also, the reliability of single-item scales is generally lower than a sum score composed of multiple items, and, whenever possible, a summated scale is preferable (Nunnally & Bernstein, 1994).

Single-item measures are most appropriate when the construct being measured is unidimensional rather than multidimensional (Sackett & Larson, 1990), but research indicates that risk tolerance is multidimensional (e.g., Jackson, Hourany, & Vidmar, 1972; Nicholson, Soane, Fenton-O'Creevy, & Willman, 2005; Soane & Chmiel, 2005; Weber, Blais, & Betz, 2002); therefore, a self-rating of general risk taking is not the optimal way to address the issue. The existence of a single (general) risk tolerance factor is debatable (Slovic, 1972).

The number of contexts for risk that have been identified differs (e.g., see Blais & Weber, 2006; Jackson et al., 1972; Nicholson et al., 2005). To some extent, the taxonomy depends on how coarsely one wants to aggregate behavior over different situations. Some authors identify more comprehensive categories, whereas others find more specific categories that can be subsumed under the more expansive ones. However, all the competing taxonomies recognize financial risk taking. Being a risk taker, in one context, does not necessarily mean that the individual will be risk tolerant on the others. Most people are inconsistent across risk contexts (Hanoch, Johnson, & Wilke, 2006; MacCrimmon & Wherung, 1990; Soane & Chmiel, 2005; Weber et al., 2002). Career decisions involving income issues are governed by financial risk taking; this is the context most appropriate to examine in relation to pay inequity.

In view of the limitations noted, further research is warranted. We sought to determine the relationship between gender, income, and risk

tolerance, relying on a multi-item measure of financial risk tolerance (rather than general risk tolerance) and using real-world data (i.e., actual salary information) rather than behavior in a laboratory task.

Method

Measure

The Survey of Financial Risk Tolerance (SOFRT; Roszkowski, 1992), developed by the first author, consists of 51 items and uses a comprehensive set of questions to tap this construct, including cognitive aspects such as probability and payoff preferences as well as emotional reactions to risk. The final section of the SOFRT requests information about both personal and household income brackets, along with other demographic information that includes gender. The coding for income was the following: 1 = under \$50,000; 2 = \$50,000–\$99,000; 3 = \$100,000–\$149,000; 4 = \$150,000–\$199,000; 5 = \$200,000–\$249,000; 6 = \$250,000–\$500,000; and 7 = over \$500,000. Scores on the SOFRT are expressed on a scale ranging from 0 to 100; the average score in the normative sample was 43 (Roszkowski, 1992). The Cronbach's alpha computed on the SOFRT's developmental sample equaled .91. In samples of actual users, Cronbach's alphas have ranged between .81 and .86, and test-retest reliability (45 days) was .83 (Roszkowski, Delaney, & Cordell, 2004).

Participants

The sample consisted of clients (451 men, 266 women) of financial planners who had used the SOFRT in the process of client advising during the years 1992 through 1998. The 717 clients who had personal income information are the basis for this analysis. The average personal income, expressed on the 7-point code, was 2.33 ($SD = 1.57$). On this same system, the household income averaged 2.86 ($SD = 1.54$). The educational level of the sample was 1.5% less than high school, 6.6% high school graduate, 22.2% some college, 35.5% bachelor's degree, 20.7% master's degree, 2.7% law degree, and 10.8% doctoral degree. The sector of the economy in which the participants were employed was as follows: 53.3% private, 11.9% public, and 34.9% self-employed. Participants' marital status was 11.4% single, 77.3% married, 8.4% divorced, and 2.8% widowed. (Employment and marital status percentages do not total 100% because of rounding.) The average SOFRT score was 41.51 ($SD = 11.17$).

Results and Discussion

The average personal income was 2.78 ($SD = 1.69$) for men and 1.57 ($SD = 0.93$) for women, which is a statistically significant difference, $F(1, 715) = 116.96$, $p = .000$, $\eta^2 = .14$, and consistent with the literature. Also, as expected, men ($M = 43.68$, $SD = 10.50$) and women ($M = 37.71$, $SD = 11.26$) differed on financial risk tolerance, $F(1, 715) = 46.27$, $p = .000$, $\eta^2 = .06$. A comparison of the two eta-squared coefficients indicated that the gender differences in earnings were larger than the gender differences in financial risk tolerance.

In terms of a point biserial correlation, the relationship between gender and income equaled .38, whereas the correlation between gender and risk tolerance was lower, .25. In other words, gender is more closely related to pay than to risk tolerance. The Pearson product-moment correlation between risk tolerance and income, in turn, equaled .22. The partial correlation between gender and income, controlling for risk tolerance differences, was .34 ($p = .000$), which is a value that is only slightly lower than the zero-order correlation. This result points out that although risk tolerance can explain some of the variation in earnings between men and women, it is not a large factor in the overall wage gap.

The relationship was also studied in terms of a multiple correlation in which personal income was the dependent variable and gender and risk tolerance were the independent variables. The multiple hierarchical regression analysis produced an R of .40 ($R^2 = .16$, both unadjusted and adjusted). The increase in R^2 of .02 resulting from the addition of risk tolerance to the regression after first entering gender ($R^2 = .14$) was statistically significant, $\Delta F(1, 714) = 14.23$, $p = .000$, but small from a practical standpoint. With both gender and risk tolerance in the equation, the standardized beta was .34 for gender and .13 for risk tolerance, and both betas were statistically significant (gender: $t = -9.65$, $p = .000$; risk tolerance: $t = 3.77$, $p = .000$). However, the ratio of the two betas indicates that the unique contribution of gender to income is more than 2½ times greater than that of risk tolerance.

In sum, the results show that (a) risk tolerance is related to earnings, (b) differences between the genders in income are greater than differences in risk tolerance, and (c) women's lower risk tolerance can explain only a slight portion of the variation in earnings between men and women. To some degree, our results thus agree with findings reported by Dohmen and Falk (2006) using a different methodology.

Although one can question whether today's work culture places an undue emphasis on the virtues of risk taking (Bozeman & Kingsley, 1998), the value of risk taking in business has long been promoted (Anonymous, 1989; March & Shapira, 1987). Self-help books for women seeking pay equity often advise them to increase their risk tolerance (e.g., Valterra, 2004). Unfortunately, it is unclear to what extent risk tolerance may be innate and immutable (Harlow & Brown, 1990). Although some management training programs have the objective of increasing willingness to undertake risk (e.g., see www.takerisks.com and www.saddlesojourns.com), only a few of the techniques purporting to produce such changes (e.g., Krueger & Dickson, 1994) have been subjected to experimental verification. However, given our results showing only a small effect size and practical significance on the impact of risk tolerance on income inequity, career counselors should not have unrealistic expectations about the extent to which such programs, even if successful, may increase pay equity.

Certain limitations of this research need to be acknowledged. First, the sample consisted of the clients of financial advisors, so the generalizability of the results to women and men, in general, can be questioned. A second limitation of this study is the age of the data, but we do not know of any evidence to suggest that the relationship has changed dramatically in the intervening period. Women's lower risk tolerance continues to

be found in more recent data (e.g., Watson & McNaughton, 2007), and, whereas the wage gap has been decreasing in Western economies (Böheim et al., 2005), the inequity continues to be an issue (e.g., see Thompson, 2008). However, if the situation is indeed different today, then our study can be viewed as a historical perspective on the matter that can serve as a benchmark for that change.

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