Labour Economics 17 (2010) 434–442

Contents lists available at ScienceDirect

Labour Economics

journal homepage: www.elsevier.com/locate/labeco

Attitudes toward risk and self-employment of young workers ☆

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ARTICLE INFO

Article history:
Received 28 September 2007
Received in revised form 20 December 2008
Accepted 30 June 2009
Available online 8 July 2009

JEL classification:
D81
J20
L26

Keywords:
Risk tolerance
Self-employment
Entrepreneurship

ABSTRACT

A high degree of risk tolerance is often regarded as one of the fundamental characteristics of entrepreneurs. Using multiple responses on risky income gambles in the 1979 National Longitudinal Survey of Youth (NLSY79), I investigate the effect of individual risk tolerance on the probability of entry into self-employment. I construct a measure of individual level of risk tolerance that is corrected for reporting error and that varies with age and other covariates that potentially affect self-employment decision. I find that risk tolerance is an important determinant of the decision to enter self-employment. However, I find that the estimated effect of risk tolerance on the probability of entering self-employment is dramatically understated if measurement error is not taken into account. In addition, I find that that accounting for the correlation between risk tolerance and other covariates is important to correctly assess the effects of the other determinants of self-employment while it has a trivial effect on the estimated marginal effect of risk tolerance.

1. Introduction

The number of self-employed workers in the U.S. has grown dramatically in recent decades. Estimates show that over ten percent of the labor force is self-employed when incorporated businesses are counted (Hipple, 2004) and a quarter of young men are self-employed at some time in their early careers (Ferber and Waldfogel, 1998). Because self-employment is often considered a way for disadvantaged workers to achieve economic prosperity and upward mobility (Fairlie, 2004), these rising rates have sparked policy makers' and researchers' interest in the determinants of self-employment.

In this paper, I investigate the role of risk preference on self-employment entry decision using repeated measures of individual risk preference from the 1979 National Longitudinal Survey of Youth (NLSY79). While individual risk tolerance has long been considered a key characteristic of entrepreneurs (Knight, 1921), empirical research has been limited by a lack of data on individual risk preference—and even when data are available, empirical researchers have typically assumed that self-reported individual risk attitudes are measured without errors (Cramer et al., 2002; Guiso and Paiella, 2005; Dohmen et al., 2005).

The important feature of this paper is that I address the issues of measurement error and time variation in self-reported risk tolerance by using multiple responses to identical "income gamble" questions asked in the NLSY79. Following Barsky et al. (1997) and Kimball et al. (2005), I correct my measure of risk tolerance for measurement error. In light of arguments that individual risk tolerance is likely to decrease with age (Morin and Suarez, 1983; Bakshi and Chen, 1994; Sahm, 2006) and in order to account for the correlation between risk tolerance and other determents of self-employment, I also allow the measure of risk tolerance to vary with age and other covariates that potentially affect self-employment decisions. I find that the estimated effect of risk tolerance on the probability of entering self-employment is dramatically understated if measurement error is not taken into account. While the latter feature proves to have a small effect on the estimated effects of risk tolerance, it affects the estimated coefficients for other determinants of self-employment.

I find that individual risk tolerance plays an important role in the self-employment entry decision. An increase in relative risk tolerance from the 10th percentile to the 90th percentile increases the predicted probability of entry into self-employment by 35%. However, using a one-time measure of risk tolerance attenuates its estimated effect by a staggering 90% because measurement error cannot be netted out. This result underscores the need to use multiple responses in order to correct self-reported risk tolerance for reporting error. In addition, I find that that accounting for the correlation between risk tolerance and other covariates included in self-employment decision model is

☆ I am greatly indebted to Audrey Light for her guidance and support during the course of this research endeavor. I am also grateful to Joe Kaboski, Bruce Weinberg, Matt Lewis, Stephen Cosslett, Hajime Miyazaki, Randy Olsen, David Blau, Padma Sahib, Andrea Ichino, three anonymous referees and participants at meetings of the Canadian Economics Association and Midwest Economics Association, and workshops at Ohio State University for their valuable suggestions and comments. I acknowledge the help of Jay Zagorsky in the creation of the net asset variable. All errors are mine.

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doi:10.1016/j.labeco.2009.06.005

important to correctly assess the effects of the other determinants of self-employment.

2. Background

Individual risk tolerance has long been regarded to be a key characteristic of entrepreneurs (Knight, 1921; Kihlstrom and Laffont, 1979). However, empirical studies that assess this view have been limited because direct measures of risk preference are hard to obtain. A few researchers have skirted this data constraint by using measures of "risky behavior" to construct indirect measures of risk preference. For example, Tucker (1988) uses self-reported measures of seat belt use, auto and health insurance coverage, and cigarette smoking while Fairlie (2002) and Francis and Demiralp (2006) use self-reports on drug use and drug dealing experience. All three studies use these self-reported behavioral measures as proxies for risk attitudes or to construct a measure of risk preference for the purpose of explaining who enters self-employment. Estimates based on these indirect measures do not always lead to the same conclusion. While Tucker (1988) finds no effects of risk attitudes on being self-employed, other studies (Fairlie, 2002; Francis and Demiralp, 2006) find that risk tolerance has a significant positive effect on the likelihood of being self-employed. Of course, these indirect measures may also identify individual attributes other than risk preference such as desire for autonomy and entrepreneurial skills (Fairlie, 2002). I am able to assess this conjecture by including Fairlie's "drug-dealing" measure along with a direct measure of risk tolerance (described below) in my empirical model, and determining whether the two measures have independent effects on the probability of entering self-employment.

Recently, a number of surveys in different countries, for example, German Socio-Economic Panel Study in Germany (SOEP) and Survey of Household Income and Wealth (SHIW) in Italy, have attempted to evaluate individual risk attitudes by including direct questions on the respondent's willingness to participate in a hypothetical lottery or willingness to pay for certain risky investment (Cramer et al., 2002; Guiso and Paiella, 2005; Dohmen et al., 2005; Donkers et al., 2001). With this type of measure, researchers look at the link between measured risk tolerance and entrepreneurship and find a positive relationship between the two (Caliendo et al., 2009; Cramer et al., 2002; Guiso and Paiella, 2005; Dohmen et al., 2005). Also, some researchers exploit psychological test data in the survey to elicit individual risk attitudes and examine its effects on self-employment (Ekelund et al., 2005). However, previous studies assume that respondents report their preferences without error and that individual risk attitudes are fixed over the life-cycle. More to the point, they are compelled to make these assumptions because they have only one response for each sample member.

Longitudinal data on risk tolerance are preferred to single responses because they allow researchers to assess the role of reporting error and, more generally, the extent to which risk tolerance changes over time. Barsky et al. (1997) developed a set of questions about hypothetical income gambling that were fielded in the 1992 wave of the Health and Retirement Study (HRS).[1] In 1994, 10% of respondents who answered the risk questions in 1992 were asked them again; this survey design enabled Barsky et al. (1997) and Kimball et al. (2005, 2008) to account explicitly for survey measurement error. In a recent paper, Sahm (2006) uses these multiple HRS responses to examine how individual risk tolerance changes over time as a function of stock market returns and personal experiences.

In 1993 and 2002, the 1979 National Longitudinal Survey of Youth (NLSY79) asked *all* respondents a set of risk questions identical to those used in the HRS.[2] Because the NLSY79 provides two responses from identical individuals, it is possible to construct a measure of risk tolerance that controls for measurement error. As I discuss in Section 4, I relax the assumption that individual risk tolerance is fixed over time for a given individual. That is, I drop the assumption that within-person variation in reported risk tolerance is only due to reporting error, and instead allow for the variations due to age and time-varying covariates as well as time-fixed individual characteristics. While the HRS is designed to study the retirement, investment and savings behavior of people over the age of 50, data from the NLSY79 are better-suited to examine individual behavior in early to mid life. To my knowledge, my study is the first to exploit the double responses available in the NLSY79 to construct a measure of risk tolerance that accounts for both measurement error and time variation.

3. Econometric specification

To assess the empirical effects of risk tolerance on the self-employment probability, I estimate an equation for the probability of entering self-employment. Focusing on the first entry self-employment decision, I consider a discrete choice model of the transition from wage employment to self-employment. The latent variable S_{it}^* represents the value of self-employment relative to wage work for individual i at time t. I assume this can be approximated by the following linear function:

$$S_{it}^* = \beta_1 \rho_{it} + X_{it}\beta_2 + u_{it} \quad (1)$$

where ρ_{it} is relative risk tolerance, X_{it} is a vector of variables that contains personal net assets, demographic characteristics, job characteristics, and environmental factors, and u_{it} represent unobserved factors.

In Eq. (1), I assume u_{it} is a normally distributed random variable and that, conditional on the control variables, u_{it} has a zero mean and constant variance. With this assumption in place, I model the probability that S_{it}^* is larger than zero, which means the individual enters self-employment within a given interval as a probit model. I expect the estimate of β_1 to be positive because the relative value of self-employment increases with risk tolerance. To obtain correct standard errors for statistical inference, I use sandwich-type "Huber–White standard errors" that account for non-independence of error terms across observations for a given individual.

4. Data

4.1. Sample selection

I use data from the 1979 National Longitudinal Survey of Youth (NLSY79). The NLSY79 began in 1979 with a nationally representative sample of 12,686 individuals who were between ages 14 and 22 at their first interview. Interviews were conducted annually from 1979 to 1994 and biennially thereafter. The original sample consists of three sub-samples: a sample of 6111 individuals representing the civilian population born between 1957 and 1964, a supplemental sample of 5295 black, Hispanic and economically disadvantaged non-Hispanic, non-black youth, and a sample of 1280 individuals who enlisted in the military before September 1978.

In selecting a sample for analysis I focus only on men, who account for 6403 of the original sample members, because self-employment decisions of women are arguably different from those of men in various dimensions (Hundley, 2000, Taniguchi, 2002). Second, I drop 1849 individuals who did not provide responses to risk questions both in 1993 and 2002; 1723 of these men leave the survey prior to 1993, 112 of men do not participated in the survey in both year, and the remaining 14 men simply failed to respond to the questions.[3] Third, I

[1] These questions are described in detail in Section 4.

[2] The Panel Study of Income Dynamics (PSID) also used the same income gambling questions in a 1996 supplement. However, the questions were asked only *once*, of respondents who were employed.

[3] Unlike high non-response rates usually found in other surveys, the response rate on the risk questions is very high in NLSY79. This is because the risk questions are not designed to ask the respondents to guess or calculate their values for the risky gambles but ask them to decide whether to accept or reject the risky options. The questions are described in detail in Section 4.3.