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Lifecycle patterns in the socioeconomic gradient of risk preferences☆

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ABSTRACT

We investigate which socioeconomic groups are most likely to change their risk preferences over the lifecourse using data from a nationally representative German survey and methods to separate age from cohort and period effects. Tolerance to risk drops by 0.5 SD across all socioeconomic groups from late adolescence up to age 45. From age 45 socioeconomic gradients emerge – risk tolerance continues to drop for the most disadvantaged and stabilizes for all other groups – and reach a maximum of 0.5 SD by age 65. These results matter because increased levels of risk aversion are associated with imprudent financial decisions in the event of crises.

1. Introduction

Economic theory on risky choices has built over many decades on the assumption that risk preferences are stable both across domains and across time (Stigler and Becker, 1977). Such assumption simplifies the mathematical derivations from economic models, but in practice it is not likely to hold. The circumstances and incentives that individuals face are certainly changing over the life-course. Some studies demonstrate that individual risk preferences systematically vary across birth cohorts due to heterogeneity in the macroeconomic (Malmendier and Nagel, 2011) or institutional (Cameron et al., 2013) climates in which the cohort members grew up, and that macroeconomic shocks may alter risk preferences in adulthood (Guiso et al., 2013). Although many attempts have been made in recent years to understand the age-related differences in risk preferences (Tymula et al., 2013; Mata et al., 2011), almost nothing is known about the individual time-varying properties of risk preferences (see Zeisberger et al., 2012).

In this study we quantify the degree of change in risk preferences as individuals age and explore the heterogeneity in this aging process across the social spectrum. The experimental economics literature, so far, could not fill this gap because

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it predominantly relies on incentive-compatible measures of risk preferences assembled for college students at one point in time. One exception is Tymula et al. (2013) who collected data on 135 individuals across all age groups, but because of the small sample and cross-sectional nature of the data no conclusions can be drawn about representativeness and true aging effects. Another exception is Dohmen et al. (in press) who circumvent the problem by using a survey-based, but validated, measure of risk preferences to identify the true aging-effects of risk preferences over a six-year window. Their study finds that risk tolerance drops monotonically as people age.

We build on Dohmen et al. (in press), but focus on the heterogeneity in the dynamics of risk preferences over time. Using seven years of the German Socio-Economic Panel (SOEP), we estimate lifecycle patterns of risk tolerance by various definitions of socioeconomic status – education, income, and occupation – to capture all possible channels through which disadvantage can affect risk attitudes. We focus on socioeconomic status because it is one of the most widely used distinctions to describe heterogeneity in attitudes and behaviors and to make policy decisions. To identify the lifecycle patterns in the socioeconomic gradient of risk tolerance we adapt a methodology used in Schurer et al. (2014), van Kippersluis et al. (2009), and Deaton and Paxson (1998) in the context of health and inequality.[1] This methodology allows us to carefully control for the cohort differences by first continuously overlaying the paths of adjusted risk scores of birth cohorts, and then averaging at each age the risk scores over those birth cohorts for which data is available. The sequence of cohort-averaged risk scores over the full age interval, in our case 20–80, approximates the lifecycle pattern of risk tolerance. The aging profile is estimated non-parametrically to allow the possibility that risk tolerance evolves non-linearly over the lifecycle using the same approach as in Schurer et al. (2014) and Kruger and Stone (2008).

This approach – overlapping aging profiles of risk attitudes of birth cohorts – also helps us to solve the identification problem when controlling simultaneously for age, cohort and period effects. It is a widely known result that one cannot separately identify age, cohort, and period effects in linear regression models without additional – often arbitrary – assumptions (see Hall et al., 2007, for an overview). As we estimate age profiles within narrowly defined birth cohorts, we do not face this identification problem. Theoretically, we could use dummy variables – in our case dummy variables indicating the years running from 2006 to 2012 – to control for the period effects. Instead, we follow in our main specification an approach suggested by Rodgers (1982) and advanced by Heckman and Robb (1985), which controls for the period effect with a proxy variable that captures the underlying environmental factors that cause a period effect in risk preferences. Similar as Dohmen et al. (in press), we assume that the business cycle is one of the most important determinants of risk preferences, and we proxy the business cycle with gross domestic product (GDP) growth rates. The underlying idea is that individuals are more risk averse in economic busts and more risk loving in economic booms (e.g. Brandt and Wang, 2003; Bucciol and Miniaci, 2013). As this is a strong assumption, we also consider time-dummy variables to capture time-specific variations in risk preferences in a robustness check.

Our measure of risk preference is the response to a general question on whether the individual considers him or herself to be fully prepared to take or avoid risks. This measure is not incentive compatible, and it suffers from the same type of scaling-bias as all measures of self-assessed health, personality, and attitudes. We rely on the work of Dohmen et al. (2011) who validated this measure by comparing its correlation with, and predictive validity of, a standard measure of risk preferences elicited through paid experiments. This measure is used in Dohmen et al. (2012) to explore the intergenerational transmission of risk and trust preferences and in Dohmen et al. (2010) to study the link between cognitive ability and risk preferences.

We find that risk tolerance declines strongly for all socioeconomic groups alike from late adolescence into middle age. From middle age onward, a dramatic gradient in risk tolerance emerges between people at the bottom and the top of the income and education ladder. People living life at the top stabilize, and even increase, their risk tolerance from age 45 onward, while people at the bottom continue to drop at the same rate as observed before middle age. These heterogeneous dynamics lead to a gap in risk tolerance between the two groups of 0.5 standard deviation, which is associated with a 2 standard-deviation difference in cognitive skills. These differences hold across different assumptions made about the period effect, they are not driven by a possible misclassification into socioeconomic class, and they are not explained by systematic panel attrition.

2. Literature review

Life is full of risks for everyone, yet, preferences over risk is a very subjective matter. Standard economic theory assumes risk preferences to be exogenous and stable (Stigler and Becker, 1977), where stability can refer to both individual variation across situations and across time (See Zeisberger et al., 2012, for an overview of the concepts). Surprisingly, very little is known about the individual-specific nature of change in risk tolerance and aversion over time.

This is not to say that nothing is known about the differences in risk preferences across age groups. Studies based on large samples generally find a negative relationship between risk attitudes and age (see Table A.1 in the Online Appendix

[1] All three studies use longitudinal data with eleven (HILDA), eight (ECHP), and nine years (PSID) of length respectively to construct age-profiles by cohort members. For instance, Deaton and Paxson (1998) construct for each birth cohort a dummy variable, and then graph for this birth cohort the health path and the variation in health over the nine years. The individual health paths of all cohorts combined display the lifecycle pattern of health. The same approach is used in Schurer et al. (2014) and van Kippersluis et al. (2009).