

The Origins of Savings Behavior*

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There is enormous variation across individuals with respect to the wealth accumulated at retirement age, even among those with very similar lifetime incomes. Economists have found that this dispersion cannot be easily explained by asset allocation choices or socioeconomic characteristics (e.g. Venti and Wise (1998)). Instead, savings behavior, i.e., the choice by an individual to save or consume earlier in life, seems to be a much more important determinant of cross-sectional variation in wealth accumulation. **Cronqvist and Siegel** address several fundamental questions related to the dispersion in savings behavior: Where does an individual's savings behavior originate from? Are individuals born with a particular savings propensity, is it governed by parents instilling preferences into their children, or is it the result of individual-specific life experiences?

The novel approach taken by the authors is to empirically decompose the variation in savings behavior across individuals into separate genetic and environmental effects and to examine possible gene-environment interplay (e.g., whether specific environments moderate predisposition to a behavior), thus blending economics and biology, a potentially important intersection of research disciplines.

The empirical analysis is motivated by the observation that (i) heterogeneity in preferences is a potentially important source of heterogeneity in savings behavior and wealth accumulation (see, e.g., Krusell and Smith (1998)) and (ii) the existence and shape of individual preferences might be the outcome of natural selection (e.g., Rogers (1994)). These conjectures imply that savings behavior is at least partially genetic or heritable. **Cronqvist and Siegel** extend recent work on

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the heritability of risk preferences to time preferences as well as possibly to other non-standard determinants of savings behavior such as cognitive ability and self-control (see, e.g., Madrian and Shea (2001)).

The particular research method, a traditional twin study design, employed by **Cronqvist and Siegel** also allows the authors to separately identify the importance of parental influences on savings behavior. The results therefore extend existing empirical evidence on parent-child similarities in savings and investment choices (see, e.g., Charles and Hurst (2003)) by determining the extent to which this similarity is genetic versus the result of social transmission of behavior from parents to their children.

The authors were able to obtain detailed income and wealth data for a large set of Swedish twins. Partly due to an individual wealth tax that was abolished in 2007, Swedish tax authorities collected detailed information on residents' holdings of financial and real assets from a large source of data providers, including banks and brokerage firms. These tax data were matched by Statistics Sweden with data on twins from the Swedish Twin Registry, which is the world's largest research database of twins. Selecting twins with positive net worth and average annual income of at least USD 1,400 (SEK 10,000), the authors obtain a data set of 14,930 twins, consisting of 4,482 identical and 10,448 fraternal twins.

An individual's savings rate, is the defined as the change in net worth between the end of 2002 and the end of 2006 divided by the disposable income over the same period. Due to the dual nature of housing as a consumption good as well as an asset, value changes of the individual's home are excluded from the change in net worth. Finally, following Venti and Wise (1998), the authors regress out the effects of socioeconomic characteristics and asset allocation choices, to obtain an adjusted savings rate (i.e., the residual from a regression with standard controls).

The decomposition of this adjusted savings rate into genetic and environmental factors rests on an intuitive insight: In identical twins, all genes are expressed in the same way, hence genetically identical twins are indeed identical. For fraternal twins, on the other hand, the average proportion of shared genetic expression (not considering genes that are expressed in the same way for all humans) is only 50 percent. Assume further that the similarity of the non-genetic environment is the same for

identical and fraternal twins. Then, more similar savings behavior among identical than fraternal twins constitutes evidence that the propensity to save, at least to some extent, originates from an individual's genetic composition. **Cronqvist and Siegel** find that savings rates are indeed much more correlated among identical than fraternal twins in our data (correlations of 0.33 versus 0.16). Formally, a random effects model with three effects (one genetic, one parental or common, and one individual-specific) and a covariance structure imposed by genetic theory is estimated by maximum likelihood.

The formal analysis produces several results:

- Genetic variation explains about 33 percent of the variation in savings behavior across individuals in the sample. Each individual hence appears to be born with an innate genetic predisposition to a specific savings behavior. The authors further find that this effect does not disappear later in life.
- Parenting effects on savings behavior (by vertical socialization, not genes) are found to be insignificant on average. A more detailed analysis reveals that the strength of the effect varies in systematic ways. In particular, parenting explains about 30 percent of the variation in savings rates for individuals around age 30, but decays significantly and attains zero starting around age 40, i.e., parenting does not have a lifelong impact on children's savings propensities. Parenting also explains more of the variation in savings behavior when there were no additional siblings in the family growing up, suggesting that parenting effects on savings are smaller when time for parenting and teaching is likely to be scarcer.
- The authors find important gene-environment interactions with respect to the family environment when growing up (as proxied for by the wealth of the parents) and with respect to an individual's current socioeconomic status (as proxied for by the individual's wealth). In both cases genetic effects are relatively stronger in more supportive environments, i.e. when wealth is higher.
- Savings behavior as measured in this study is correlated with income growth, smoking, and body mass index. A formal decomposition of these correlations reveals that the correlations are

mainly due to genetic and not environmental factors. This evidence suggests that the genetic component of savings behavior indeed reflects time preferences as well as lack of self-control.

The authors show that the results are robust to different measures of savings behavior as well as several assumptions underlying the twin study design, including the assumption of equal environments of identical and fraternal twins. In particular, the authors find similar results for a sub sample of twins that were either separated early in life or that do not communicate frequently with one another.

Taken together with existing twin-study evidence on income and investment choices, the results imply that variation in wealth at retirement is to some extent due to genetic variation and only to a small extent due to variation in upbringing or in other parental effects. Indeed, decomposing net worth of 11,992 twins, age 60 to 69, at the end of 2006, reveals that genetic variation accounts for almost 40% of total variation, while parental effects, including inheritances, account for about 7% of total variation. Importantly, more than half of the variation in wealth at retirement seems to depend on other individual-specific experiences, events, and circumstances.

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