Extended Abstract

Life Course on Track? Long-Term Economic Returns to Early Tracking in Denmark

Jesper F. Birkelund, University of Copenhagen, jfb@soc.ku.dk.
Kristian B. Karlson, University of Copenhagen, kbk@soc.ku.dk.

Preference: Oral presentation.

Background

Most research on the consequences of educational tracking examines the impact on short-term outcomes such as test scores, grades, final educational attainment, or early labor market outcomes. While these are crucial stratification outcomes, they provide little insight into the overall life cycle effects of educational tracking, including the extent to which inequalities caused by tracking grow across the life course. We examine this question using a unique sample of Danes born around 1954. More specifically, we examine year by year the life cycle economic consequences of lower secondary tracking in Denmark from ages 26 through 59.

Danes born in 1954 experienced highly tracked lower secondary schools (in grades 8-9) in which children were divided into a basic and an advanced track with widely differing curricula. The advanced track prepared children for going to academic upper secondary education, whereas the basic track prepared students for either vocational training or unskilled labor. The allocation to tracks depended to a large degree on children’s demonstrated academic performance in primary school.

Controlling for the selection into tracks on family background and cognitive ability measured before children are tracked, we find substantial income returns to attending the advanced rather than the basic track in lower secondary schools in Denmark. However, these returns begin to cumulate after age 40, suggesting that tracking has few short-term economic effects. In terms of lifetime cumulative income measured at age 59, individuals attending the advanced track earn on average post-tax 100,000 Euros more than individuals attending the basic track do. Further analyses show that about three-quarters of the returns are mediated by final educational

---

attainment and social class position, indicating that educational tracking sets in motion highly stratified pathways that ultimately lead to substantial economic benefits over the life cycle.

**Data and Methods**

We analyze a unique probability sample of Danish children born around 1954. The sample comprises two data sources. The first is longitudinal survey data collected from grade seven and onwards. It comprises very rich information on family background, cognitive ability at age 14, and lower secondary school track placement at age 15. The second is the Danish administrative registers (to which the survey data has been linked via personal identification numbers). The registers provide highly reliable income information from 1980 through 2013, i.e., from ages 26-59, and information on income trajectories, final educational attainment, and social class position (measured with EGP). Our final sample comprises 2,516 respondents out of 3,151 children in the original sample, and we correct all analyses for the survey design (a two-level stratified cluster sample).

We present different sets of estimates of the trends in income using a nonparametric trend specification (i.e., age dummies) in a conventional linear regression. We subsequently add covariates to examine the extent to which the raw or unconditional trend can be explained by these covariates. We graph our results using average marginal predictions implied by the given linear regression model specification. As our dependent variable, we use a measure of disposable income provided in the administrative registers, i.e., a measure of net-of-tax and post-transfer income. The income measure is in Euros measured in 2015 prices. Our family background measures comprise parental education, parental social class (measured with EGP), annual income of the main provider, family structure, number of siblings, and rural-urban origin. All of these measures are tapped when the child is 14 years old. Our cognitive ability measures are three cognitive tests administered at age 14, measuring verbal, spatial, and inductive reasoning.

**Results**

Figure 1 shows the disposable income profiles (i.e., the nonparametric year-by-year age trends) by lower secondary school track placement. As Figure 1a indicates, the gross gap between those attending the basic and advanced tracks are large and grow significantly across the occupational career. In particular, from around age 40, the gap begins widening. In terms of lifetime cumulative post-tax disposable income—as reported in Figure 2—the raw between-track gap amounts to roughly 200,000 Euros, a very substantial gap. However, as Figures 1b
and 1c show, controlling for all family background indicators and the three cognitive ability
tests (measured before the respondents are tracked) leads to a dramatic decline in the between-
track gap. The net gap is negative when the respondents are in their 20ies, zero when children
are in their 30ies, and begins increasing at around age 40. At age 59, the average disposable
income differs by slightly more than 10,000 Euros per year. As Figure 2 shows, in terms of
lifetime cumulative income, the returns to attending the advanced track (compared to attending
the basic track) is about 100,000 Euros. Thus, the selection into track placement on family
background and early skills explains about 50 percent of the raw gap.

To examine further the potential pathways through which these returns are brought about, in
Figure 2 we report estimates of the between-track gap in cumulative income controlling for
respondents’ final educational attainment (measured at age 35) and their EGP class (measured
at age 45). We find that adding these variables to the models explain almost three-quarters of
the net returns to attending the advanced track compared to the basic track. This finding
suggests that early tracking sets in motion career pathways that ultimately lead to very large
economic returns.

Conclusion

We document substantial long-term effects of lower secondary school track placement for
persons born around 1954 in Denmark. However, the effects only begin to cumulate after age
40, indicating that track benefits begin cumulating from occupational maturity and onwards.
While lower secondary school tracking was abolished in 1975 in Denmark, the practice of
dividing students into groups for instructional purposes still exists in many countries,
suggesting that early tracking in other countries may spur life courses with very different
economic living conditions.
Figure 1. Disposable income profiles by lower secondary school track placement.

a. Raw trend

b. + Family background

c. + Cognitive ability tests

Note: The figures report average marginal predictions by track placement from a linear regression model with a nonparametric age trend. 95 percent confidence intervals.

Figure 2. Lower secondary school track placement gap in cumulative disposable income