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Intergenerational Top Income Persistence

Denmark half the size of Sweden

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Abstract

In this paper, we investigate intergenerational top earnings and top income mobility in Denmark. Access to administrative registers allowed us to look at very small fractions of the population. We find that intergenerational mobility is lower in the top when including capital income in the income measure - for the rich top 0.1 % fathers and sons the elasticity is 0.466. Compared with Sweden, however, the intergenerational top income persistence is smaller in Denmark.

I. Introduction

Intergenerational income mobility is key to the understanding of how individual opportunities and social status vary across groups and between countries. Here, we present novel estimates for the father-son intergenerational top income mobility for Denmark and compare them with similar estimates for Sweden. We find that intergenerational top income persistence in Denmark is smaller than in Sweden and present some possible explanations for this finding.

II. Background

The literature shows that top income shares in the Western world are increasing (Atkinson et al., 2011; Piketty, 2014; Roine & Waldenström 2015) and that intergenerational father-son income mobility is small for high incomes, reaching a very low level for the top end of the income distribution. In particular, this holds for Sweden, which despite its relatively low income inequality and high intergenerational income mobility, has a 0.1 % top income elasticity of 0.896 compared with an overall elasticity of 0.260 (Björklund et al., 2012). Björklund et al. (2012) further find that

capital income is the prominent channel in the transmission at the very top of the income distribution.

The question addressed here is whether the high intergenerational top income persistence found for rich Swedes also holds for rich Danes— given that Sweden and Denmark can be characterized as Scandinavian welfare regimes with similar levels of earnings mobility (Hussain et al., 2009). Nevertheless, the two countries have different capital income distributions and industrial structures – for example, major companies in Sweden are larger than their counterparts in Denmark.

III. Empirical framework

Based on practice within mobility studies, the intergenerational determination of children's incomes can be expressed by the following regression equation:

(1) $\log y_{ci} = \alpha_c + \beta_c \log y_{pi} + \varepsilon_{ci}$,

where $\log y_{ci}$ denotes the natural logarithm of income of a child in family i and y_{pi} the corresponding measure of the parent. We control for the age and age squared of the parent (p) and child (c). The error term ε_{ci} depicts the combined effect on the child's income of factors orthogonal to parental income, and β_c is the intergenerational elasticity of the child's income given the parent's income.

Because inheritance is not equally strong across the whole income distribution—revealed as nonlinearity (Bratberg et al., 2007)—intergenerational income mobility is analysed over the full income range by using piecewise linear regression estimations (spline regressions). This implies "separate" estimations for parent-child pairs belonging to different parent income percentiles—P25, P50, P75, P90, P95, P99, P99.9—which allow the slopes to vary over the earnings and income distributions (Greene, 2012). Therefore, the interpretation of the β-coefficient in equation (1) is the

percentage differential in the expected earnings or income of the son, given a percentage differential in earnings or income of the parent, for example, within the top P99.9-100 fractile.

IV. Data

The data stem from administrative registers at Statistics Denmark including information on earnings, capital income, and benefit payments for the period 1980–2008. A unique personal identification number allows merging of the information of every father and son. The father is in almost all cases the biological father, but if there is no information, then the step father living with the mother at the end of the son's birth year is used. Using register information implies that there are no coverage problems, but the capital incomes may nevertheless suffer from evasion and avoidance and improper imputation of income from owner-occupied housing and other capital goods.

In this study, the second generation (sons) is aged 35–42 years in 2008 or, equivalently, 7–14 years in 1980 (father incomes are measured from 1980 to 1984). This relatively broad age bracket is important for minimizing the problem of non-homogeneity in the residuals, see Solon (1992), Zimmerman (1992), Haider & Solon (2006), Hussain et al. (2009) and Lee & Solon (2009): i.e. individuals with high lifetime income tend to have steeper income growth trajectories. Nybom & Stuhler (2014) also stresses that incomes measured around midlife causes the smallest life-cycle bias.

However, even permanent income estimates based on 5-year periods may underestimate the intergenerational persistence, see e.g. Hendricks (2007) showing that measures of persistence based on lifetime earnings increase 30% compared with measures using only 5-year periods. Here, fathers are aged between 25 and 88 years in 1984 why we control for their age. The income concepts

include individual earnings from work, business, and capital income (incl. capital gains of stocks), see Björklund et al. (2012) using similar definitions, and Roine & Waldenström (2012), who demonstrate that realized capital gains are very important in the Swedish setting. Moreover, only individuals with positive earnings or income in each of the five years (2004–2008 for the child and 1980–1984 for the parent) are included. Incomes are inflated to 2008 by the CPI from Statistics Denmark.

We exclude observations if the absolute dfbeta diagnostic, which detects individual observations with unusually high influence on parameter estimates (Belsley, Kuh and Welsch, 2005), is above $2/n^{1/2}$ and the absolute standardised residual is above 3. These outliers count for only 1½ % of the observations, but the exclusion has no impact on the estimated coefficients' structure, i.e. the correlation coefficients for the estimates with and without the outliers are above 0.96. The number of observations is 1,993 (earnings) and 2,612 (income) in the top percentile and, thereby, 199–261 in the 0.1 top income percentile (fewer observations for earnings).

V. Results

Table 1 show that the intergenerational earnings and income elasticities for father-son increase up to a certain point and then decrease, leaving the top percentile out of consideration: The father-son income elasticity is 0.065 for the P0-25 group, 0.428 for the upper-middle P50-75 group, and 0.199 for the P99-99.9 group. At the very top end of the distribution (P99.9-100), we found that only the income elasticity for father-son is significant, and high, i.e. a 10% higher income among the P99.9-100 group of fathers implies on average a 4.66% (estimated β_c=0.466) higher income among their sons.

In comparison, the intergenerational income elasticity at the P99.9-100 fractile (0.1%) in Sweden is 0.896 for father-son (Björklund et al., 2012) and hence is nearly double the size of that for Denmark

(a t-test =1.92 significant on a 5.5 % level shows a difference). For the group P99-99.9, the income elasticity for Sweden is also greater than that for Denmark (0.392 versus 0.199). The top earnings elasticity for Denmark is insignificant, whereas it is positive and significant (0.447) for Sweden; accordingly, top earnings mobility is less likely in Sweden than in Denmark. For the lower and middle part of the father-son income and earnings distributions, we found similar nonlinearities in Denmark as in Sweden.

Table 1. *Earnings and total income elasticities for father and son. Spline regression . Denmark*

	OLS=IGE	P_{0-25}	P_{25-50}	P_{50-75}	P_{75-90}	P_{90-95}	P_{95-99}	$P_{99-99.9}$	$P_{99.9-100}$
Earnings (n=199336):									
Estimate	0.171***	0.022**	0.304**	0.413**	0.243**	0.281**	0.220**	0.162**	-0.076
St. error	0.002	0.003	0.016	0.016	0.019	0.034	0.024	0.037	0.085
Income[1] (n=261248):									
Estimate	0.241***	0.065**	0.390**	0.428**	0.345**	0.252**	0.288**	0.199**	0.466**
St. error	0.002	0.004	0.015	0.015	0.018	0.031	0.020	0.031	0.071

[1]Earnings, capital income and income transfers.
** $0.01<p<0.05$, ***<0.0001.

The persistence for the two measures increases along the income distribution and reaches a maximum at the P50-75 knot after which it decreases to the same levels up to the P99-P99.9 fractile in both countries. Additionally, the differentials between the income and earnings coefficients are of similar magnitude.

Moreover, the overall (regression to the mean) intergenerational income elasticity is of the same magnitude in Sweden (0.260) (Björklund et al., 2012) as in Denmark (0.241). Capital income is found to be the most important channel of top income intergenerational persistence, but apparently more so in Sweden than in Denmark. A possible explanation is that inheritance of capital income and large companies over generations play a bigger role in Sweden than in Denmark given thatcapital income in Sweden constitutes a bigger share of total income in the top 0.1 % end of the distribution than in Denmark (Figure 1)and the structure of businesses is different in the two

countries. The largest Swedish enterprises (250+ employees) represent 41% of total value added, while the largest Danish enterprises represent relatively less value added (33%) (OECD, 2014).

Figure 1. Share of capital income in Denmark and Sweden. P99.9-100
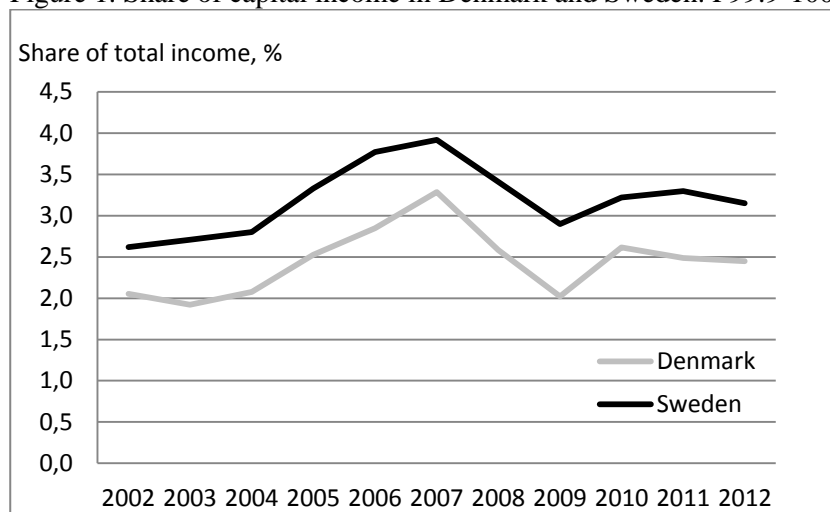
Source: Own calculations: Swedish data based on the The World Top
Incomes Database (http://topincomes.parisschoolofeconomics.eu/)
Danish data based on register data from Statistics Denmark.

Hence, Sweden's largest private enterprises are bigger than their counterparts in Denmark. The inheritance of the bigger enterprise ownerships (sometimes incl. CEO positions) and capital income in the top – may explain the lower top intergenerational mobility among Swedes.

VI. Conclusion and Summary

Here, we considered the intergenerational elasticities between fathers and sons' earnings and incomes in the top end of the distributions in Denmark and compared them with findings for Sweden.

We found that intergenerational elasticity is higher for income than for earnings, and that the elasticity increases with higher levels of earnings and income. For both Denmark and Sweden,

nonlinearities in the father-son relationships over the income distribution are found, and at the very top end of the distribution—P99.9-100—the father-son income persistence in Denmark is about half the size of that in Sweden.

A possible explanation for the lower intergenerational income persistence in the top end of the income distribution in Denmark compared with Sweden is an inheritance of more capital income and bigger companies in Sweden.

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