Born with a silver spoon: Danish evidence on intergenerational wealth formation from cradle to adulthood[1]

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Abstract

Using longitudinal data on wealth holdings of parents and children in Denmark, we show the intergenerational rank correlation of wealth develops at early age of the child and reaches its long-term value of about 0.25 by the time children are in their teens. While assets owned by children at that point of the life-cycle are naturally small, asset-holdings at age 18 are already more informative than parental wealth in predicting wealth holdings of children many years later when they are in their 40s, especially for families at the top of the wealth distribution, where childhood asset ownership is widespread. This indicates that parental behavior early on is a critical factor for the development of intergenerational wealth correlation and goes beyond previously studied channels, such as correlation of earnings and saving in adulthood, or transfers late in life and at death.

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"Mum, Teresa, quoth Sancho, 'tis not all Gold that glisters [sic], and every Man not born with a Silver Spoon in his Mouth." (Motteux 1719, p. 345; English translation of Cervantes' 'Don Quixote' 1605-15).

1 Introduction

Some individuals own economic resources/wealth already in early childhood. Having significant wealth early in life is a marker for coming from a family that makes direct transfers to their offsprings, and such children are therefore literally "born with a silver spoon". In this paper, we use Danish wealth records to understand the relevance of wealth observed in childhood. Beyond documenting the richness of wealthy kids and shedding light on the sources underlying their wealth, we are interested in understanding the role of childhood wealth for the intergenerational formation of wealth. In particular, we focus on two questions. First, how does intergenerational wealth correlation develop as a function of the age of the child? Second, how informative is wealth in childhood for predicting future economic well-being, both by itself and incrementally over parental characteristics?

A voluminous literature has studied intergenerational relationships in economic outcomes such as income, education, and health (see surveys by Solon 1999 and Black and Devereux 2011). Intergenerational linkages in wealth are in many ways at least as interesting—for example, intergenerational transmission of wealth at the top of the distribution underlies concerns of Piketty (2014) about self-perpetuating wealth inequality—but are much less studied probably because of data limitations. Charles and Hurst (2003) provide estimates for United States using the PSID survey data.[1] Our own work (Boserup, Kopczuk, and Kreiner 2014) provides estimates for Denmark using the same data sources used in this paper, and focusing on wealth holdings of adults in different generations. This prior work shows that Denmark has higher wealth mobility than the US, in line with recent evidence showing higher income mobility in Denmark than in the US (Chetty, Hendren, Kline, and Saez 2014). Moreover, the intergenerational mobility of wealth is considerably lower than the mobility of income, in particular in the top part of the distribution, where child wealth is strongly related to parental wealth, and the child-parent wealth relationship is surprisingly stable,

[1] Charles and Hurst (2003) review a few older studies looking at the intergenerational correlation of wealth. These studies have looked at small, non-representative samples with few observations and poor data quality. Another recent study estimate intergenerational wealth mobility on UK data without direct intergeneratuional family links, but using an imputation method based on rare surnames to link families across multiple generations (Clark and Cummins 2014)

for example across age groups.

Our study contributes to the literature on intergenerational mobility by examining ownership of economic resources already in childhood in contrast to existing studies of income and wealth mobility, which look entirely at the child generation in adulthood. As a result, we provide new insights about how the relationship of wealth between parents and children develops. Our analysis is based on high-quality wealth records from Denmark covering all child-parents pairs of more than fifty child cohorts born since 1960 and with wealth information for a nearly thirty year period from 1983 to 2011. This data enables us to zoom in on wealthy children in the top 1% group and the top 0.1% group and to provide strong non-parametric evidence on the development of wealth formation from "cradle to adulthood".

First, we analyze how many children are wealthy and the size of their wealth. Our results show that only few children own any assets until age 12—going from 1 percent for one year old children to 10 percent at age 12—and that the level of wealth is modest even among the wealthiest in early childhood. For example, the level of wealth equals 1/5 of GDP per capita for the top 1% wealthiest among one year old children. By late teens and when moving into adulthood, most children have at least a bank account, but their overall level of wealth is still small. On the other hand, the average wealth levels of the top 1% wealthiest are non-trivial as they have climbed up to over three times GDP per capita at age 15 and almost five times GDP per capita at age 18. The wealth level of top 0.1% individuals at age 18 corresponds to more than 20 times GDP per capita.

Second, we study the underlying sources of wealth of children. Evidence from payroll records confirms that it is not driven by labor income of children. By restricting the sample to children with all grandparents alive, we show that inheritance from grandparents is also unimportant. This leaves inter vivos transfers as the only remaining explanation and we provide evidence of bunching at kinks in the tax schedule for gifts, confirming that at least some of the wealth of children is due to tax-motivated inter vivos transfers. This is in line with evidence showing that tax incentives matter for inter vivos transfers in adulthood (e.g., Bernheim, Lemke, and Scholz 2004, Joulfaian 2005, and Kopczuk 2007).

Third, we study the relationship between positions of children and parents in their respective age-specific wealth distributions. We start by estimating the rank correlation for the full population of children and parents. This shows that the intergenerational correlation develops almost immediately once children own any assets and reaches its long-term value of about 0.25 by the time children are in their teens. Naturally, most young children do not have any assets, so the

intergenerational rank correlation of wealth for the general public follows very nonlinear dynamics: it is low when children are very young, and accelerates when they start having their earnings and associated savings in mid-teens. The picture is different when we look at the relationship between rich children and their parents, reflecting different asset ownership dynamics. The intergenerational relationship at the top of the wealth distribution is strong even for very young children, and then grows smoothly as a function of child age up to around the time when the child moves into adulthood at the age of 18, and does not change much thereafter. For a 1 year old, the likelihood of being in the top 0.1% group is on average 44 times the unconditional probability if parents are in the top 0.1%, and the likelihood is 160 times the unconditional probability by the age of 18.

It is perhaps natural to expect that wealthy parents have wealthy children, but it is not clear to what extent this is informative about their future outcomes and to what extent it is informative beyond what may be inferred from parental wealth information alone. Hence, our final objective is to analyze to what extent wealthy children become rich in adulthood. We start by looking at wealthy babies—defined as individuals who were one year old in 1983 and among the top 1% or top 0.1% wealthiest within their cohort at that time. Among the top 0.1% babies, 5 percent are still in the top 0.1% group just before turning thirty years old, which corresponds to 50 times the random odds. Hence, despite the small size of wealth holdings at age 1, early life wealth holdings convey a signal of future position in the wealth distribution. Then, we ask to what extent own and parental information at the beginning of adulthood (at age of 18) helps in predicting future wealth holdings (at age of 45). Both parental and own position in the wealth distribution at age of 18 turn out to be very informative about being wealthy in the future (at age of 45). Interestingly, child's own position is informative even conditional on parental position and, in fact, the coefficient on the child being in the top 1% at 18 is higher than the coefficient on the parent being in the top 1% at the same time. When looking at other economic outcomes at age 45, such as earnings, broad income, and years of schooling, we also find that the child's own position in the wealth distribution at age 18 is at least as strong a predictor as the position of the parents.

This set of findings highlights that the intergenerational transmission of wealth is not simply a function of parental wealth, but also of parental behavior starting early in childhood of offsprings. Hence, while inheritances, transfers late in life, and transmission of earning potential are undeniably important as well, parental transfer behavior during childhood of their offsprings is critical for understanding intergenerational wealth transmission. As wealth early on is mostly due to transfers, it might be tempting to think that these transfers alone are important. However, wealth at this point

is still too small to directly account for future wealth. Hence, it is likely that these early transfers are markers for parents who are focused on their children's financial well-being, and their importance may operate both through correlation with subsequent transfers and through transmission of a range of behaviors that may come with asset ownership, such as saving propensity and investment patterns.

The remaining part of the paper is organized as follows. Section 2 provides information about the relevant legal and institutional rules in Denmark. Section 3 describes the data and provides some summary statistics. Section 4 describes the results of the empirical analysis. Finally, Section 5 offers concluding remarks.

2 Institutional framework

In Denmark, it is possible for children to own assets but only adults—defined as individuals of legal age, which is eighteen years or older—may borrow.

Wealth observed during childhood is unlikely to stem from labor income of the child because of the Danish labor market regulations. Children under thirteen years old may not work for an employer with the exception of participation in certain cultural activities approved by the police, such as theatre, circus, radio, television, or work as a photo model. Teens who are thirteen and fourteen years old may perform so-called light work such as cleaning and newspaper delivery but only for a limited number of hours. The fifteen-to-seventeen age-group may work in any kind of job that is not dangerous, but most individuals in this age group will still be in the education system.

If labor income of children cannot account for their wealth, then it has to be the result of wealth transfers, either inter vivos gifts or inheritance. Bequest to children or grandchildren (or parents) above a basic allowance—equal to DKK 264,100 in 2011—is taxed at a flat rate of 15 percent and 36.25 percent if given to other persons.[2] Gifts to children and grandchildren above a yearly basic allowance—equal to DKK 58,700 in 2011—are taxed at the same rate as bequest, while gifts to non-relatives are treated as personal income and taxed accordingly.

Inter vivos transfers to children may be tax motivated. For example, making gifts below the basic allowance may be a strategy to avoid inheritance taxation. It may also reduce capital income taxation. For example, stock income in Denmark is taxed separately from other income in a progressive tax scheme with two tax brackets; the tax rates are 27% and 42% in 2011. By transferring

[2] Exchange rates are approximately 8.5 DKK per GBP, 7.5 DKK per EURO, and 5.5 DKK per USD in 2011.

wealth to the child, capital income that would otherwise be taxed at the high rate may now be taxed at the low rate (it would be illegal for parents to transfer funds to the children and later transferring it back to themselves in order to save taxes).

Denmark also has tax-favored rules for so-called child savings accounts (funds may be on deposit accounts but may also be placed in securities). Only parents, grandparents, etc., can make deposits. The capital income from this type of savings is tax exempt. The political goal of this special tax scheme is to teach young people to save money and to have sensible financial behavior. In line with this goal, funds in an account cannot be withdrawn until at least seven years after putting the money in the account. It is only possible to put money in the account until the child is fourteen years old, and the amounts that may be put in the accounts are small. For example, in 2011 a maximum of DKK 3,000 can be deposited in the account of a child per year, and the total amount a child can receive on the account is limited to DKK 36,000.

3 Data

Our analysis is based on individual wealth data available at Statistics Denmark. The data contains the aggregate value of assets and liabilities, respectively, covering the period 1983 to 2011, and from 1997 and onwards it is also possible to obtain complete portfolio information with respect to the value of bonds, stocks, cash in banks, real estate, mortgage loans, and the sum of other loans. The wealth data is based on administrative tax return records from the Danish Tax Agency (SKAT), which collects information about the values of asset holdings and liabilities of all individuals measured the last day of the year.

Most of wealth components are third-party reported.[3] The information about the value of financial assets and liabilities at the end of the year is reported to the tax authorities by banks, other financial institutions, and some government institutions, while the cash value of real estate is assessed by the tax authorities, based on detailed information of the real estate, and used for taxation of the imputed rent.[4] Third-party reported values of assets include all deposits, stocks,

[3] The information on wealth was originally used to compute the wealth tax, which was in place until 1996. Today it is used by the tax agency to cross check if the reported income level is consistent with the change in net-wealth during the year under the assumption of a given estimated consumption level. A recent study of tax evasion behavior by Kleven et al. (2011) finds only small differences between the third-party reported income items and the corresponding items on the final tax return. This indicates that the third-party reported information of the Danish Tax Agency is of a very high quality.

[4] The public values of real estate are normally below market value. For each year, we adjust the values upwards following Leth-Petersen (2010) by using the average relative difference between the selling price and the public value of real estate traded that year.

bonds, value of real estate, and deposited mortgages. Pension funds are not part of the data, which is also the case in the US study by Charles and Hurst (2003), but when measuring wealth in childhood, it is not relevant. Third-party reported values of liabilities include debt in financial institutions, mortgage credit debt, credit and debit card debt, deposited mortgage debt, student debt and debt in The Mortgage Bank (a public institution), debt to financial corporations, debt to the Danish municipalities, and other liabilities such as unpaid taxes and mortgage debt, which are not deposited.

Until 1996, Denmark had a wealth tax, and taxpayers had to self-report car values, boat values, caravan values, title deed of cooperative dwellings, premium bonds, cash deposits, stocks (both listed and non-listed thereby including privately held companies), and private debt. These components are not included in the computations after 1996, when the wealth tax was abolished. Until 1996 the value of stocks was self-reported, while afterwards it became third-party reported by banks and financial institutions (excluding non-listed stocks). The registration of the company value of self-employed has changed several times, but has stayed unchanged since 1997, where assets and liabilities of the firm were registered separately and included, respectively, in the assets and liabilities of the owner.

More details on the data on wealth may be found in Leth-Petersen (2010) and Boserup, Kopczuk, and Kreiner (2014).

Every citizen in Denmark is assigned a unique personal identification number at birth and the identification numbers of the mother and the father are registered for all Danes born from 1960 and onwards. This enables us to link wealth information across generations and to link the wealth data to other registers containing birth year, education, and income.

In the empirical analysis, we consider two samples. First, we analyze a pooled cross-sectional data set (PCD) containing all individuals who are 1–40 years old in the years 2000-2011 and have parents who are alive. We stop at age 40, which for year 2000 corresponds to the first cohort where parents are systematically registered, i.e. the cohort born in 1960. We consider one-year age groups with information pooled over the years, corresponding to pooling 12 cohorts for each one-year age group. Table 1 provides summary statistics of the variables in the sample for 10-year age intervals. It shows that average wealth is very low as expected for children of age 1-10 and nearly 100 times as high for the age group 31-40. Wealth is a little lower for the age group 21-30 than the age group 11-20, probably reflecting study loans and maybe also pension savings not registered in our data. Below, we study in greater detail the age dependency. In the sample, we have on average close to

650 thousand observations in each one-year age group of the child. The variation in the number of observations across child age in the sample reflects that older children are more likely to have lost one of their parents and that the size of the cohorts varies with, e.g., large cohorts in the age group 31-40 compared to the age group 21-30.

The second sample is a panel data set (PD) where we follow two cohorts of individuals who are born in 1965 and in 1982, respectively, and where both parents are alive in 2011. We follow these individuals from they are 1 year (18 years) old in 1983 until they are 29 years (46 years) old in 2011. Table 2 provides summary statistics of the variables in this sample. It shows that we have around forty thousand observations in each cohort. Apart from wealth, the table also provides information of education, earnings, and broad income in adult life, which we will use to analyze whether child wealth is predictive of future economic well-being.

4 Empirical results

This section describes the empirical results. A subsection is devoted to analyzing each of the following questions: How many children are wealthy and how wealthy? What are the sources of child wealth? To what extent do wealthy parents have wealthy kids, and how does this intergenerational relationship develop as a function of child age? Does wealth of children predict future economic well-being?

4.1 How many children are wealthy and how wealthy?

Figure 1 displays the share of individuals who own assets and the share of individuals with liabilities in each one-year group in the PCD sample. These two non-parametric relationships show that both asset ownership and loan take-up increase with age. A little less than 1 percent of one-year olds own assets and are therefore potentially wealthy kids. The asset ownership share rises gradually to 10 percent at age 12, after which it increases sharply to 91 percent at age 15; a level only slightly below its level in adulthood, which is stable around 97 percent.

The loan take-up graph shows that nearly nobody has debt before the age of 18, reflecting that only individuals of legal age may borrow as described in Section 2. The graph jumps up to 20 percent for individuals at age 18 and then increases gradually up to around 90 percent at the age of 30 and is then nearly flat up until the age of 40.

In Figure 2, we look in greater detail at asset ownership. Panel A shows the share of each age

group having bank deposits, securities, and real estate, respectively, while Panel B shows for each age group the aggregate value of each type of asset relative to the total value of assets owned by the age group. In childhood, all wealth is in bank deposits and securities with ownership rates increasing gradually from 1 to 10 percent for bank deposits and from 1 to 4 percent for securities in the age span 1–12 years. For these age groups, securities make out 70-75 percent of total wealth. Note also the ownership rate of bank deposits in Panel A mirrors the curve for all assets in Figure 1 with the same sharp increase from the age of 12 to 15, reflecting that children start participating in the labor market at this age (see Section 4.2). Real estate ownership is not relevant before adulthood, but during adult life it increases and becomes the single most important asset, accounting for more than 80 percent of the total asset value in the thirties.

In Figure 3, we zoom in on the top 1% group and the top 0.1% group in the age-specific wealth distributions. Panel A displays the value of the percentiles 99 and 99.9 for each age group, and Panel B shows the mean wealth levels of top 1% individuals and of top 0.1% individuals. The graphs start at reasonably low levels of wealth. For example, percentile 99 is close to zero for one-year olds reflecting that only around one percent of these children have positive wealth. The wealth share of top 1% is therefore close to 100 percent at this stage. However, the average wealth level of the top 1% group of one year olds is DKK 28 thousand,[5] which is reasonably low compared to, for example, the GDP per capita of 196 thousand in 2011 and an average wealth level of 40 year olds, which equals DKK 357 thousand in our data. The wealth level of the top 0.1% group of one year olds is around 6 times higher than the top 1% group but this still corresponds to only 85 percent of GDP per capita. As might be expected, all graphs are increasing, reflecting that wealth is increasing over the life cycle. The fastest growth occurs during early childhood. At the age of 5, the average wealth of top 1% children is already non-trivial 187 thousand DKK, and the average wealth of top 0.1% children equals DKK 1 million, which is five times GDP per capita. At the age of 15, the wealth levels have increased to a factor of more than three times GDP per capita for top 1% and a factor of 13 for top 0.1%, and when formally becoming adult according to Danish law at age 18, the wealth level of top 1% corresponds to almost five times GDP per capita while the level of top 0.1% corresponds to more than 20 times GDP per capita.

[5] This amount corresponds to 3,300 GPB, 3,700 EURO and 5,100 USD when using 2011 exchange rates approximately equal to 8.5 DKK per GBP, 7.5 DKK per EURO, and 5.5 DKK per USD.

4.2 Sources of child wealth?

The sources of children's wealth cannot be obtained directly from the data. However, as described in Section 2, it is unlikely that the observed wealth reflects labor income of the children. This is confirmed by Figure 4, which shows for all ages in the interval 1-20 years the average earnings of the top 1% wealth group and of those not in the top 1% group. Wage income is virtually zero for both groups until the age of thirteen. This is consistent with the legal framework in Denmark, described in Section 2, which prevents children from working before turning thirteen years old, and implies that the wealth of the children must come from wealth transfers. From age thirteen to eighteen, mean earnings rise up to a level around DKK 40 thousand, which is still only around 1/5 of GDP per capita. Notice also that during this period in life, children who are not in top 1% earn significantly more in the labor market than the wealthy children.

In early childhood, it is unrealistic that wealth stems from bequest related to parental death. However, it may come from bequest related to the death of grandparents. In Figure 5, we repeat the graph of Figure 3, Panel B, displaying average wealth of the top 1% group and show the same graph for a restricted sample of the top 1% group that only includes children where all four grandparents are alive. This reduces the sample considerably, e.g., from around 7,000 to 3,900 observations for one year olds and approximately from 6,300 to 550 observations for eighteen year olds, but the two graphs are nearly identical demonstrating that bequest from grandparents are not the driving force behind the wealth of the rich children.

This leaves inter vivos transfers as the only remaining main source that can explain large wealth in childhood. Inter vivos transfers might very well be tax motivated as described in Section 2, but it is difficult to identify this effect precisely because of the existence of different tax motives at the same time and because non-taxable wealth transfers do not have to be reported to the tax authorities. Still, we can investigate whether wealth transfers are influenced by the tax scheme for gifts by taking advantage of the fact that gifts below a basic allowance are non-taxable. We do so in Figure 6.

For all individuals in the age groups 1-12 years, we register the first time an individual has positive wealth and measure the distance to the threshold at which the gift tax starts to apply (the yearly basic allowance is equal to DKK 58,700 in 2011 as described in Section 2). In order to ensure that wealth is not due to earned income, we restrict attention to children with no earnings in the year in question or the year prior to that. We then plot the number of individuals in bins

in order to look for bunching around the threshold, which is evidence that the behavior underlying wealth transfers responds to the tax incentive (Saez 2010). Since the basic allowance applies for each person giving a gift, we look for bunching both around the level of wealth corresponding to one person giving the maximum untaxed amount and around the level corresponding to two persons giving the maximum untaxed amount (say both parents or two grandparents). Panel A and Panel B provide evidence of bunching in both cases, which shows that some of the wealth of children is due to inter vivos transfers and that tax incentives have a role to play in the decision-making underlying these transfers, in line with evidence of tax-motivated inter vivos transfers in adulthood (e.g., Bernheim, Lemke, and Scholz 2004, Joulfaian 2005, and Kopczuk 2007).

4.3 To what extent do wealthy parents have wealthy kids, and how does this intergenerational relationship develop as a function of child age?

In Figure 7, we explore the relationship between positions of children and parents in the wealth distribution in the PCD sample. We start in Panel A by looking at the full population of children and parents by estimating the rank correlation coefficient between children and parents separately for each age group of children. This is done by first computing the position/rank of children and parents, respectively, in the within age*year specific wealth distribution (for the parents we use their average age), and then regressing for each age group of the children the rank of the child against the rank of the parents and a constant. Panel A displays estimates and confidence intervals for each age group. This procedure based on within-cohort rank correlation has several advantages compared to other intergenerational measures when analyzing wealth as discussed in Boserup, Kopczuk, and Kreiner (2014).[6]

The non-parametric relationship in Panel A reveals that the intergenerational correlation is rather low in early ages and rises rapidly in early teens, driven by the previously documented pattern of asset ownership with few children having any assets until their teens. While this is natural given the patterns of ownership of assets, it is interesting to note the degree of correlation afterwards. The correlation coefficient reaches its peak level already when the child is 19 years old, declines somewhat afterwards and stabilizes when children are in their 30s. The key observation is that the intergenerational correlation develops almost immediately once children own any assets and reaches its long-term value of about 0.25 already in mid-teens.

[6] We randomize the rank within individuals having the exact same level of wealth, which is particularly important for young children who have zero wealth.

While the general wealth correlation pattern in the teenage years is driven by asset ownership, the top of the wealth distribution is qualitatively different. Everybody at the top owns assets, and we may therefore expect different dynamics. In Panels B and C, we analyze the intergenerational relationship at the top of the wealth distribution by regressing the top 1% child wealth dummy—computed from the age*year rank measure—on the top 1% parental wealth dummy and by regressing the top 0.1% child wealth dummy on the top 0.1% parental wealth dummy (with a constant term included in both sets of regressions). The first observation from Panel B is that age dependence does not exhibit the same dynamics as the general wealth correlation. Top 1% and top 0.1% correlations evolve smoothly through teenage years, suggesting that ownership of assets in these groups is driven by different forces than for the general public. While most teenagers start owning assets when they start having their first jobs in their teens, children of the wealthy do not exhibit discontinuous increases in their wealth around that time, further reinforcing our previous conclusion that the primary reason for their asset ownership are transfers from their parents.

For one year old children, the propensity to be in the top 1% group is 2.4 percentage points higher if parents are in the top 1% group (Panel B). This implies that the likelihood of becoming a top 1% child is 3.4 times higher if the parents are in the top 1% group compared to the unconditional probability (i.e., 2.4%+1% divided by 1%). At age 5, the intergenerational relationship is much higher with a likelihood of becoming a top 1% child that is 9 times higher than the unconditional probability. The intergenerational relationship becomes stronger as a function of child age (and thereby also parental age) up to around the time when the child moves into adulthood at the age of 18. The likelihood of being in the top 1% group at this age is over fifteen times higher than the unconditional probability if parents are in the top 1% group, and the intergenerational relationship is almost constant at this level until age 30, after which it declines slightly.

The top 0.1% relationship in Panel B has the same shape as the top 1% relationship in panel A. Note though that the magnitudes are much larger when compared to the unconditional probability of being in the top 0.1% group. It is 44 times higher (4.3%+0.1% divided by 0.1%) for a one year old, around 100 times for a 5 year old, and around 160 times for an 18 year old.

For comparison, we have redone the analysis with earnings instead of wealth. Appendix Figure A1 shows the intergenerational correlation at the top of the wage distribution by, for each child age, regressing a top 1% child earnings dummy on a top 1% parental earnings dummy and a constant term. The earnings graph is strikingly different from the graph for wealth in Figure 7, Panel B. The intergenerational correlation of earnings is around zero until the child is 25 years old, and then

develops gradually up to its long run level attained around age 30. This is in stark contrast to the intergenerational relationship in wealth in Figure 7, Panel B, which develops already from the child is born and reaches its long run level when children are in their teens. Hence intergenerational correlation in earnings is not the reason for the intergenerational correlation of wealth at the top of the distribution. Moreover, the intergenerational correlation in the top of the wealth distribution is much higher than in the top of the earnings distribution.

4.4 Does wealth of children predict future economic well-being?

This section uses the PD sample to analyze the extent to which wealthy children become rich in adulthood. In Figure 8, we select out individuals who were wealthy as a child in 1983 and then follow them over the course of the next almost 30 years. Panels A (Panel B) looks at individuals born as wealthy babies—defined as individuals who were one year old in 1983 and among the top 1% (top 0.1%) wealthiest within the cohort at that time. When these individuals are five years old, 44% are still among the top 1% wealthiest within the cohort of peers who were also present in 1983. More interestingly, the curve converges to a level of about 5 percent, which is significantly larger than the random odds of 1 percent. Moreover, this difference is much higher when looking at the top 0.1% group. In this case, the likelihood of staying in the top 0.1% group from age 1 to age 29 is 5 percent, which is 50 times the random odds. Hence, despite the small size of wealth holdings at age 1, early life wealth holdings convey a signal of future position in the wealth distribution. In Panel C and D, we follow instead the cohort who was 18 years old in 1983 and 46 years old at the end of the period. The top 1% group converges in this case to 15 percent and the top 0.1% group to 8 percent. Thus, high wealth in early adulthood is a very strong indicator of having high wealth more than 25 years later despite the fact that the mean wealth in top 1% at age 18 is only 1/10th of what it is at age 40, cf. Panel B in Figure 3.

While child's wealth is very informative about being wealthy in the future, it may just reflect information about parental wealth. In Table 3, we analyze this question by relating child's wealth position at age 45 to both child's position at age 18 and to parental wealth measured also when the child is 18. We focus attention on the 1965 child cohort who were 18 years of age in 1983. The question of interest is whether wealth at the onset of adulthood remains an important indicator even conditional on parental wealth. In the first three columns, we again focus on the dummy for being in the top 1% wealth group at age 45. Both wealth of the child and of the parents when the child is age 18 are informative on their own, with the coefficient on child's own wealth exceeding

the one on parental wealth. Including both variables at the same time retains this pattern, while only slightly attenuating both coefficients. Hence, wealth at age 18 is an important marker for future wealth outcomes beyond what may be inferred from parental wealth alone. It is possible that this childhood wealth is correlated with additional future transfers, but it may also reflect intergenerational transmission of saving propensity and investment behavior.

We also analyze whether child wealth and parental wealth are important for other outcomes, such as income, earnings, and education. Both parental wealth and own wealth at age 18 are again correlated with both earnings and income at age 45, but these correlations are weaker than those for wealth. The relationship with income partially reflects mechanical correlation due to investment returns on accumulated wealth. For earnings, both own and parental presence in the top of the wealth distribution doubles the odds of being in the top 1% of the earnings distribution, but this effect is small in comparison to the impact on wealth status where odds increase ten-fold.

In the last three columns of Table 3, we analyze whether child wealth is predictive for the education level attained—another outcome that has been extensively studied in an intergenerational transmission context. Indeed, both own wealth at age 18 and parental wealth are very informative, with top 1% dummies increasing the likelihood of an education level higher than a Bachelor degree by 9 and 7 percentage points, respectively, from a baseline level of around 20 percent. Finally, note that across all the types of outcomes, child wealth is at least as good as parental wealth in predicting the outcomes when adult.

In Appendix Table A1, we run regressions with the rank in the distribution of wealth, income, and earnings instead of top 1% dummies. Across all specifications, child wealth rank is more predictive than parental wealth rank in predicting future wealth rank, income rank, and earnings rank. This further reinforces our conclusion that child wealth dominates parental wealth in predicting future outcomes of the children.

5 Concluding remarks

Measurement and understanding of intergenerational mobility is a subject of active research. Using Danish data, we show that correlation in wealth holdings is visible already in early childhood and this relationship develops through childhood and teenage years. For the general population, the relationship between wealth of parents and children is weak until kids are old enough to have their own earnings. However, the story is different at the top of the distribution, where the intergen-

erational relationship grows smoothly with age. We provide evidence that the relationship at the top of the wealth distribution is facilitated by inter vivos transfers from parents (or grandparents), and that own earnings or receiving bequests are not important parts of the story behind wealth observed before adulthood.

Wealth transfers taking place in childhood are very predictive of future wealth and other economic outcomes. Even the relatively small amounts of assets that some children own one year after birth is predictive of their economic status in adulthood, and wealth of the child when entering into adulthood is even more informative than wealth of parents in predicting future economic well-being.

These results indicate that understanding direct inter vivos transfers and transmission of investment related behavior are important for understanding intergenerational wealth mobility. Our results complement findings in Björklund, Roine, and Waldenström (2012) and Boserup, Kopczuk, and Kreiner (2014)—who document that wealth persistence at the top of the distribution is much stronger than for the general population—by indicating that different mechanisms are at play in making these relationships unfold and that they unfold at different points in childhood. These findings also indicate that we may gain insights about wealth concentration in the future by observing current children's wealth-holdings. This is particularly interesting given the recent focus on top wealth (Piketty 2014) that puts particular emphasis on issues surrounding intergenerational wealth mobility and difficulties in measuring contemporaneous trends in wealth concentration (see Bricker et al. 2014, Saez and Zucman 2014, and Kopczuk 2015).

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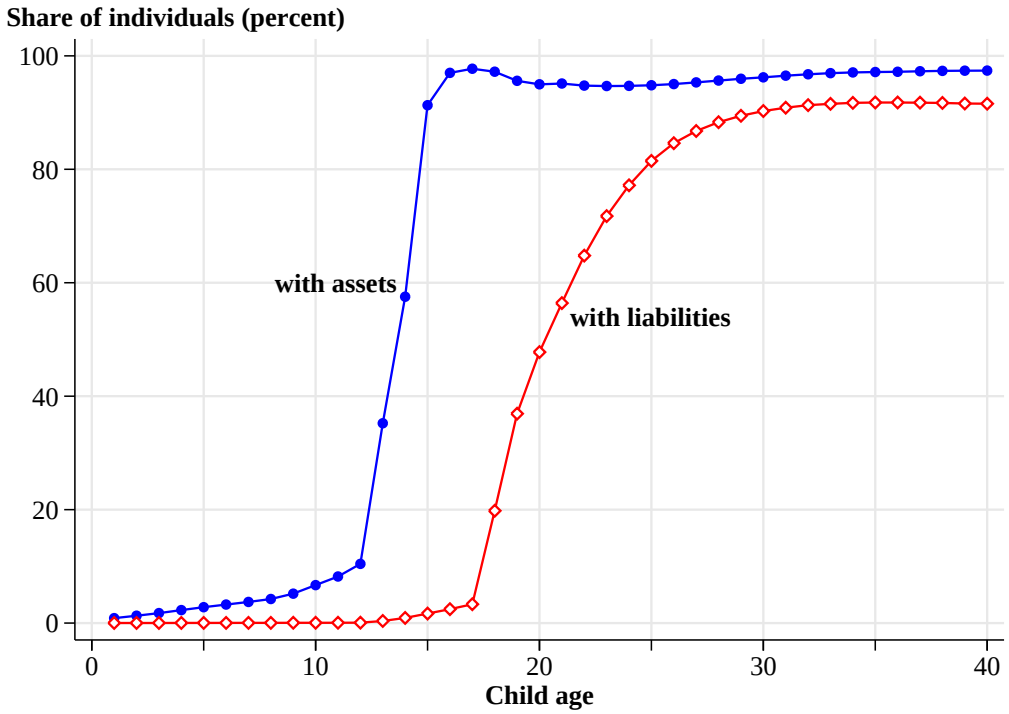

Figure 1: Ownership of assets and liabilities by child age

Notes: The figure shows the share of the children owning assets and the share of children having liabilities within each one-year group in the PCD sample. The PCD sample and the definitions of assets and liabilities are described in Table 1.

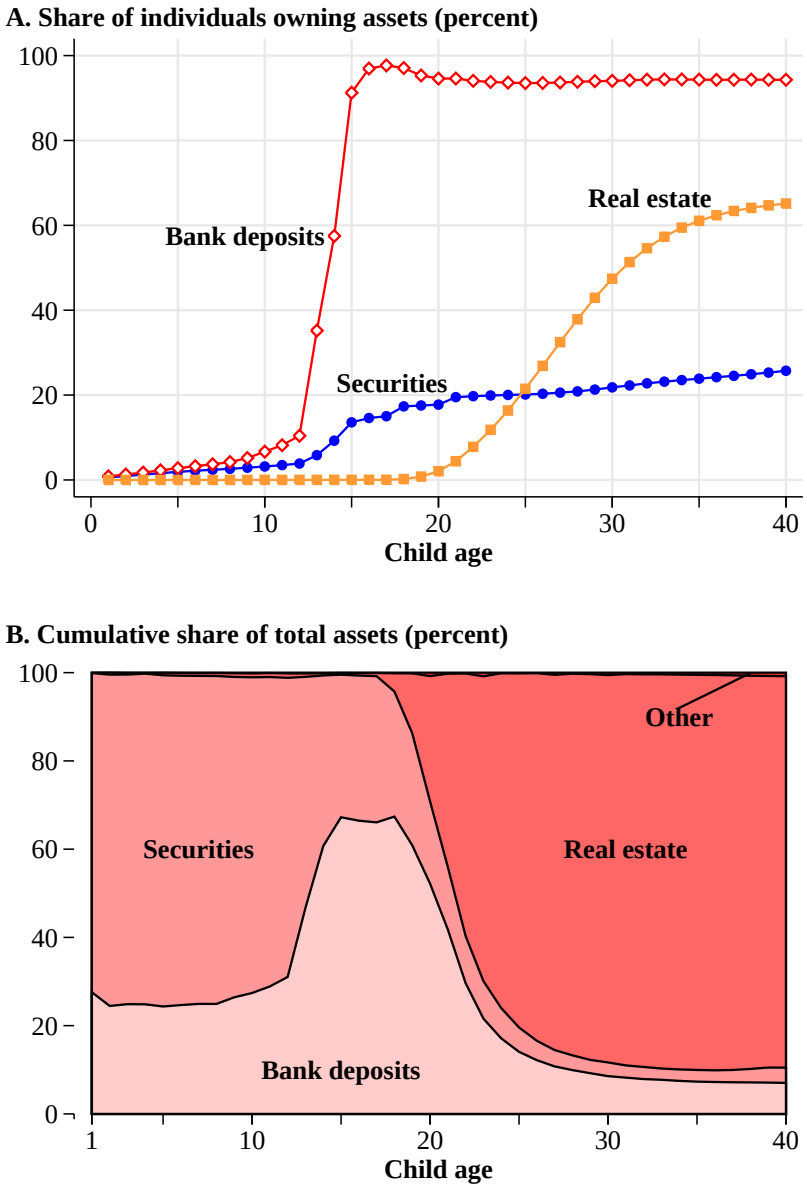

Figure 2: Asset ownership by child age

Notes: Panel A shows the share of the children within each one-year age group in the PCD sample who have bank deposits, securities, and real estate, respectively. Panel B shows for each one-year age group in the PCD sample the aggregate value of each type of asset relative to the total value of assets owned by the age group. The PCD sample and the definitions of assets and liabilities are described in Table 1.

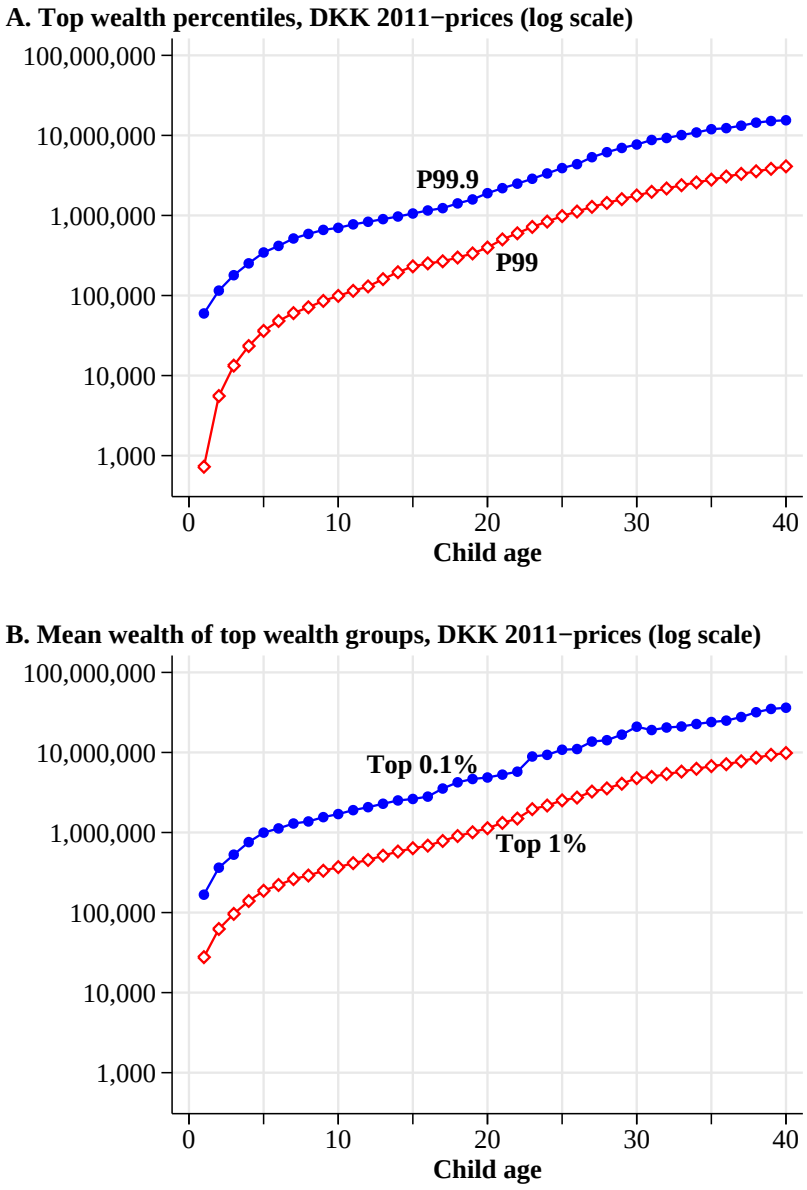

Figure 3: Wealth levels in top wealth groups by child age

Notes: Panel A shows the value of percentile 99 and percentile 99.9 in the age-specific wealth distribution in the PCD sample. It is derived by first computing the percentiles for each of the years 2000-2011 and then taking the average value. Panel B shows the mean wealth levels for children in the top 1% group and in the top 0.1% group in the age-specific wealth distribution in the PCD sample. The PCD sample and the definition of wealth are described in Table 1.

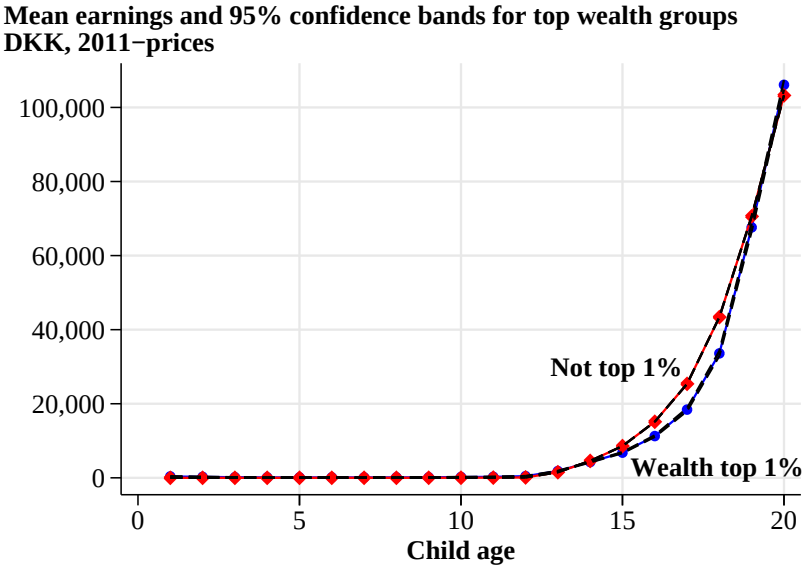

Figure 4: Mean earnings by child age

Notes: The figure shows the mean earnings level for individuals in the top 1% wealth group and for individuals not in the top 1% wealth group in the PCD sample. The black dashed lines represent 95% confidence bounds using robust standard errors. The PCD sample is described in Table 1.

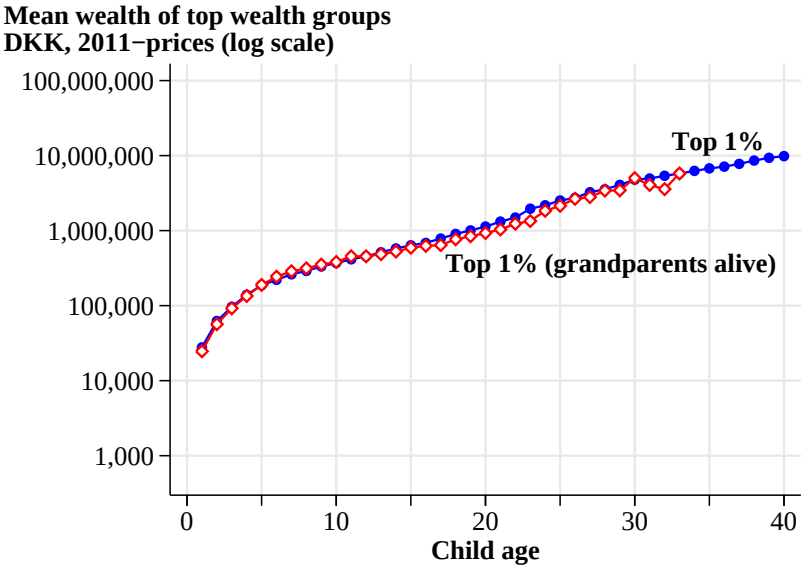

Figure 5: Wealth level in the top 1%

Notes: The figure is based on the PCD sample described in Table 1. The figure repeats the graph in Figure 3, Panel B, of the mean wealth levels for children in the top 1% group in the age-specific wealth distribution and shows the same graph for a subsample conditioning on all four grandparents being alive.

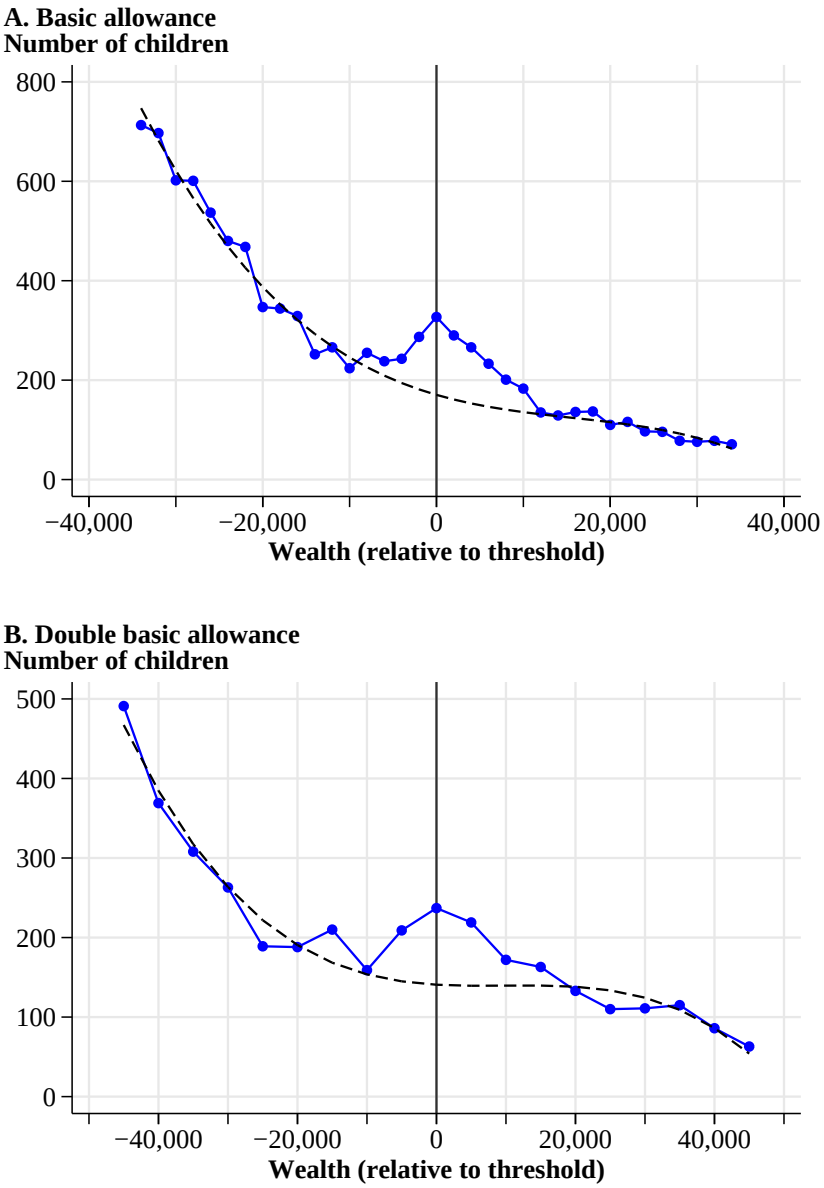

Figure 6: Bunching at the exemption level of gift taxation

Notes: These figures are based on a subsample of the PCD sample. For all individuals in the age groups 1-12 years, we register the first time an individual has positive wealth and then measure the distribution of these amounts across individuals relative to the basic allowance applying for intervivos transfers/gifts in the relevant year (demarcated by the vertical line at 0). Gift taxation applies if an individual gives an amount beyond the basic allowance as described in Section 2. In Panel B, we consider the distribution around a level corresponding to two times the basic allowance, reflecting that the basic allowance may be exploited by both parents or by two grandparents. Each point in Panel A (Panel B) shows the number of observations in a DKK 2,000 bin (5,000 bin). The solid line beneath the empirical distribution is a third-degree polynomial fitted to the empirical distribution excluding the points [-10,000;10,000]. The PCD sample and the definition of wealth are described in Table 1.

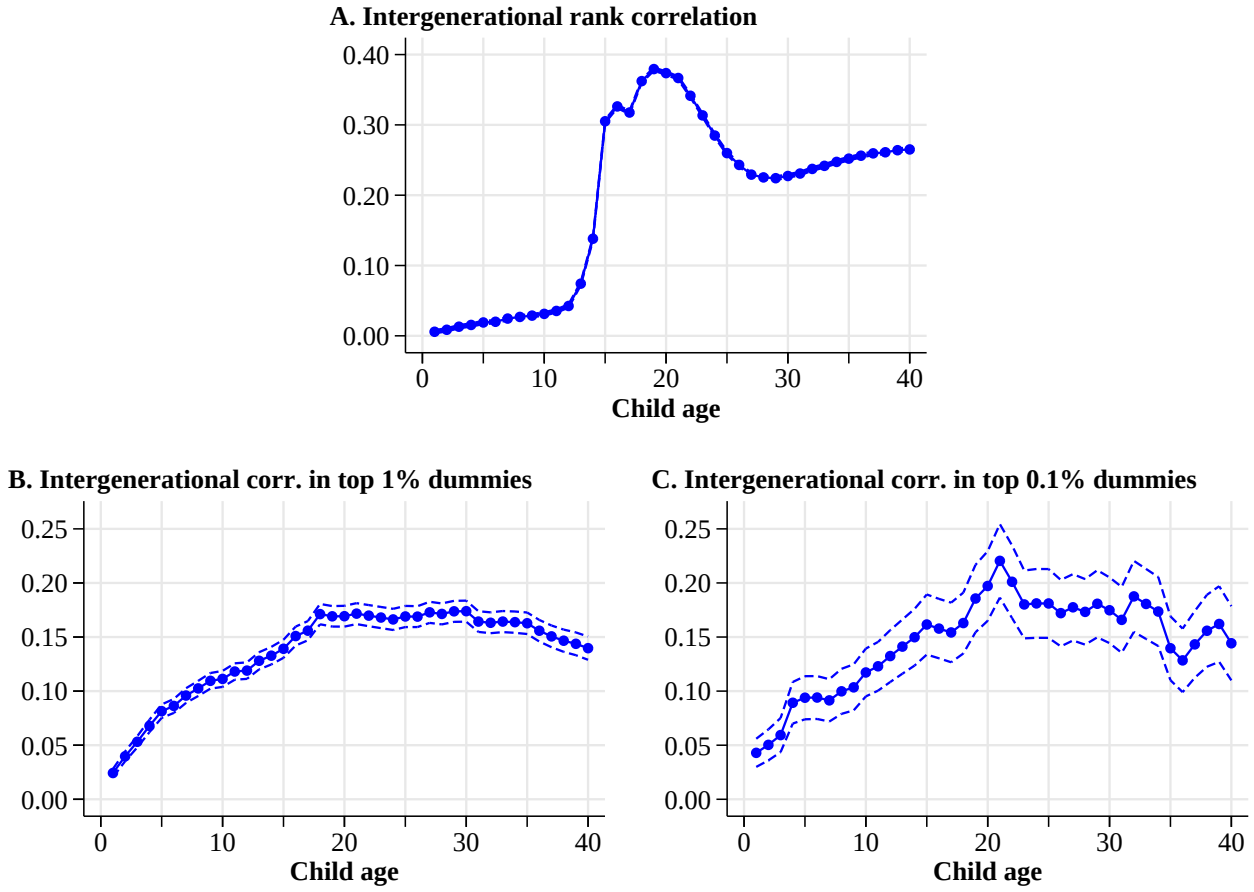

Figure 7: Intergenerational rank correlation and correlation in being in top wealth groups by child age

Notes: The figures are based on the PCD sample described in Table 1. The graphs are constructed by first computing the position/rank of children and parents separately in the within age*year specific wealth distribution (for the parents based on the average age). Parental ranks are measured the same year as child ranks. The rank is randomized within individuals having the exact same level of wealth. Panel A reports rank correlation estimates obtained by regressing separately for each age group of the children the rank of the child against the rank of the parents and a constant term. The dashed lines represent 95% confidence bounds using robust standard errors. In Panel B and Panel C, we run similar regressions but estimate a child top x% dummy on a parent top x% dummy, where the top x% dummies are computed from the rank in the age*year specific wealth distribution for children and parents separately.

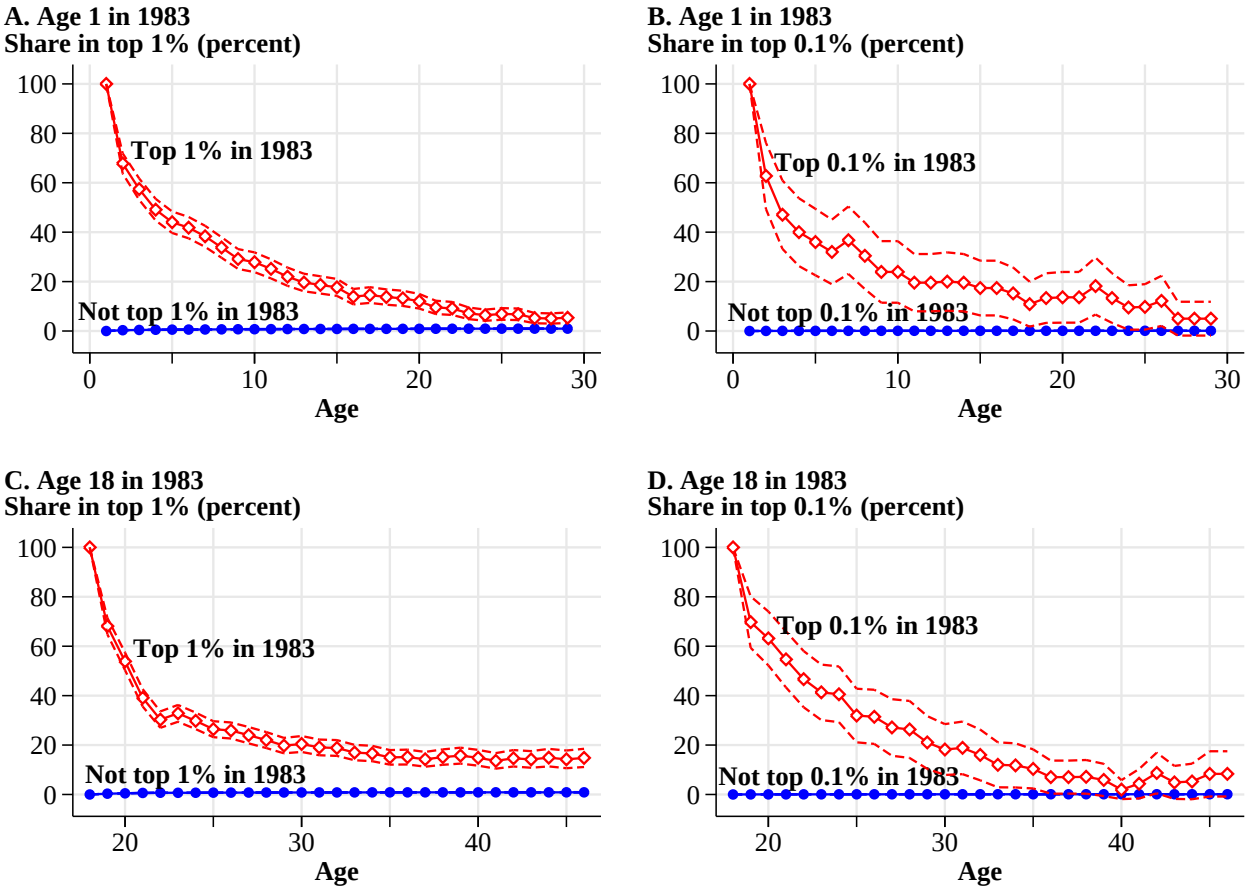

Figure 8: Survival rates of top wealth groups, 1983–2011

Notes: The figures are based on the PD sample described in Table 2. The figures are constructed by first computing the within-cohort specific position/rank of the individuals at each age/year and then following the position of individuals who begin in the top x% wealth group by estimating for each age/year the share of individuals in this group who stay in the top x% wealth group (among those individuals originally present in 1983). In Panel A and Panel B, we look at the cohort of individuals who are one year old in 1983, and in Panel C and Panel D, we look at individuals who are eighteen years old in 1983. The dashed lines represent 95% confidence bounds using robust standard errors.

Table 1: Summary statistics - Pooled cross-section data (PCD) sample

	Child age			
DKK, 2011-prices	1-10	11-20	21-30	31-40
Bank deposits	616	14,500	40,094	71,316
	(23,547)	(83,443)	(195,263)	(446,965)
Securities	1,768	7,602	14,369	27,812
	(127,048)	(632,813)	(1,055,046)	(1,969,030)
Real estate	16	2,190	264,425	860,043
	(13,102)	(105,442)	(2,184,581)	(5,375,055)
Other assets	2	63	1,140	5,365
	(2,641)	(72,537)	(694,799)	(492,024)
Total assets	2,402	24,354	320,026	964,526
	(137,092)	(676,126)	(2,716,738)	(6,091,805)
Total liabilities	1	4,833	305,494	750,927
	(844)	(71,666)	(1,670,951)	(4,247,354)
Net wealth	2,401	19,521	14,532	213,599
	(137,083)	(668,615)	(1,956,215)	(3,705,787)
Mean earnings	12	25,452	189,326	304,755
	(684)	(72,768)	(300,662)	(503,542)
Parental net wealth	609,782	1,035,290	1,476,358	1,873,380
	(8,351,969)	(14,591,684)	(15,080,704)	(14,610,559)
Share of children with all grandparents alive	0.4601	0.1980	0.0270	0.0004
Observations	7,133,829	6,687,550	6,050,249	6,052,203

Notes: Pooled information for the years 2000-2011. The PCD sample contains for each year all Danes in the age group 1-40 years, where both parents are alive. The table reports mean values and standard deviations (in parentheses) of the variables. Standard deviations are clustered at the individual level. The category Bank deposits includes all types of deposit accounts in banks and other financial intermediaries. The category Securities includes all publicly traded stocks, bonds, derivatives etc. Real estate denotes the public value of the real estate assessed by the Danish tax agency. Following Leth-Petersen (2010), public values are adjusted in each year using the average relative difference between the selling price and the public value of houses sold in that year in order to account for that public values underestimate the market values. Spouses with joint ownership of assets are each registered with half of the total asset value. The component Other assets is computed as the residual after subtracting deposits, securities, and real estate from total assets in the registers and reflects for example company values of self-employed. The category Total assets denotes the aggregate value of assets in the registers adjusted for the underestimation of real estate values. The category Total liabilities is the aggregate value of liabilities in the registers and includes all types of interest-bearing debt. Net wealth is defined as total assets minus total liabilities. Parental net wealth is the sum of net wealth of the biological father and mother. All values are converted to 2011 DKK prices using the BNP deflator (exchange rates are approximately equal to 8.5 DKK per GBP, 7.5 DKK per EURO and 5.5 DKK per USD in 2011).

Table 2: Summary statistics – Panel data (PD) sample

	Cohort			
	1965		1982	
DKK, 2011-prices	Age 18	Age 45	Age 1	Age 28
Avg. child wealth	30,967	359,852	443	-58,860
	(124,060)	(2,137,741)	(22,625)	(607,341)
Avg. child income		437,098		276,488
		(383,952)		(141,025)
Avg. child earnings		338,677		218,874
		(286,572)		(155,989)
Share with higher education		0.205		0.184
		(0.404)		(0.387)
Avg. parental wealth	508,041		-101,038	
	(2,243,194)		(1,176,564)	
Observations	38,131	38,131	42,877	42,877

Notes: The PD sample contains yearly information from 1983 to 2011 of all individuals belonging to the two cohorts who are one year old and eighteen years old, respectively, in 1983 and where both parents are alive in 2011. The table reports mean values and standard deviations (in parentheses) of the variables. Income includes earnings, capital income, self-employment income, and all types of transfers. Higher education is a dummy variable equal to one for persons with more than college education/BA degree, corresponding to having strictly more than 15 years of formal schooling (measured at age 44 for the 1965 cohort and at age 27 for the 1982 cohort). All monetary values are converted to 2011 prices using the BNP deflator.

Table 3: Top 1% dummy regressions of child outcomes at age 45 on child and parental top wealth indicators measured when the child was 18 years old.

	Child outcomes at age 45											
	Wealth top 1%			Income top 1%			Earnings top 1%			Higher education		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
At child age 18:												
Child wealth top 1%	0.133 (0.018)		0.114 (0.018)	0.032 (0.010)		0.029 (0.010)	0.014 (0.008)		0.011 (0.008)	0.108 (0.024)		0.094 (0.024)
Parents wealth top 1%		0.114 (0.017)	0.090 (0.016)		0.022 (0.009)	0.015 (0.009)		0.014 (0.008)	0.011 (0.008)		0.089 (0.023)	0.069 (0.024)
Constant	0.009 (0.000)	0.009 (0.000)	0.008 (0.000)	0.010 (0.001)	0.010 (0.001)	0.010 (0.001)	0.010 (0.001)	0.010 (0.001)	0.010 (0.001)	0.204 (0.002)	0.204 (0.002)	0.203 (0.002)
Observations	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131
R-sq.	0.018	0.013	0.025	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001
Adj. R-sq.	0.018	0.013	0.025	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.001

Notes: The regressions in the table are based on the 1965 cohort of the PD sample. Robust (hc3) standard errors are reported in parentheses. The top 1% dummy variables of children and parents are computed separately in the age*year specific distributions (for the parents based on the average age). The PD sample and the different variables are described in Table 2.

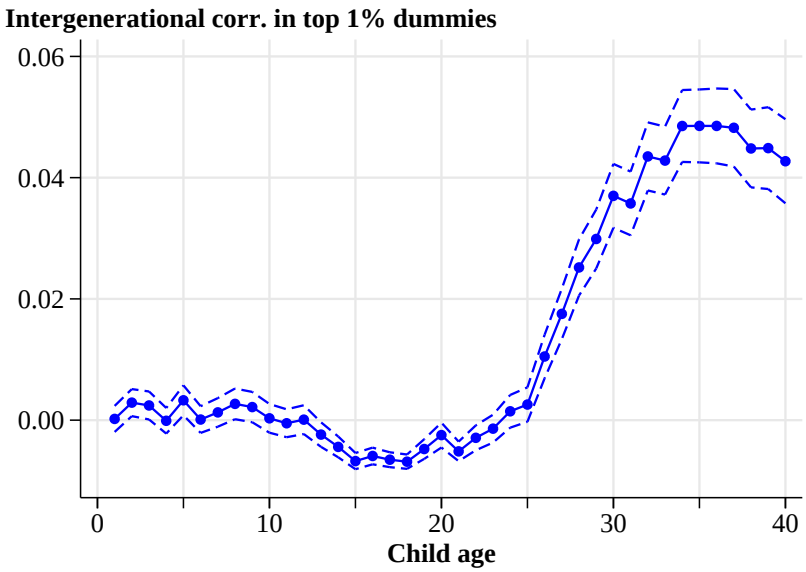

Figure A1: Intergenerational correlation in being in top 1% earnings groups by child age

Notes: The figure is based on the PCD sample described in Table 1. The graph is similar to Figure 7, Panel B, but based on earnings of children and parents instead of wealth. The graph is constructed by first computing top 1% earnings dummy variables of children and parents separately in the within age*year specific earnings distribution (for the parents based on the average age). The parental position is measured the same year as for the child. Second, intergenerational correlation estimates are derived by regressing separately for each age group of the children, the child top 1% dummy on the parent top 1% dummy and a constant. The graph displays the estimates and the dashed lines represent 95% confidence bounds using robust standard errors.

Table A1: Rank-rank regressions of child outcomes at age 45 on child and parental wealth ranks measured when the child was 18 years old.

	Child outcomes at age 45								
	Wealth rank			Income rank			Earnings rank		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
At child age 18:									
Child wealth rank	0.257		0.226	0.161		0.143	0.107		0.094
	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)
Parental wealth rank		0.179	0.122		0.107	0.071		0.075	0.052
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
Constant	37.151	41.050	32.557	41.964	44.665	39.301	44.670	46.245	42.731
	(0.279)	(0.294)	(0.333)	(0.293)	(0.297)	(0.352)	(0.294)	(0.296)	(0.354)
Observations	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131	38,131
R-sq.	0.066	0.032	0.080	0.026	0.011	0.031	0.011	0.006	0.014
Adj. R-sq.	0.066	0.032	0.080	0.026	0.011	0.031	0.011	0.006	0.014

Notes: The regressions in the table are based on the 1965 cohort of the PD sample. Robust (hc3) standard errors are reported in the parentheses. The position/rank of children and parents are computed separately in the age *year specific distributions (for the parents based on the average age). The rank is randomized within individuals having the exact same level of the variable underlying the rank measure. The PD sample and the different variables are described in Table 2.