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ABSTRACT

American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States*

We develop methods and employ similar sample restrictions to analyse differences in intergenerational earnings mobility across the United States, the United Kingdom, Denmark, Finland, Norway and Sweden. We examine earnings mobility among pairs of fathers and sons as well as fathers and daughters using both mobility matrices and regression and correlation coefficients. Our results suggest that all countries exhibit substantial earnings persistence across generations, but with statistically significant differences across countries. Mobility is lower in the U.S. than in the U.K., where it is lower again compared to the Nordic countries. Persistence is greatest in the tails of the distributions and tends to be particularly high in the upper tails: though in the U.S. this is reversed with a particularly high likelihood that sons of the poorest fathers will remain in the lowest earnings quintile. This is a challenge to the popular notion of 'American exceptionalism'. The U.S. also differs from the Nordic countries in its very low likelihood that sons of the highest earners will show downward 'long-distance' mobility into the lowest earnings quintile. In this, the U.K. is more similar to the U.S..

JEL Classification: J62, C23

Keywords: intergenerational mobility, earnings inequality, long-run earnings

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1 Introduction

The extent to which socio-economic outcomes depend on family background is an issue of great interest to both social scientists and policy makers. One way of assessing the extent of social mobility in a country is to compare it with other countries. Sociological studies of class and occupation have for decades provided insights into cross-country differences and similarities in intergenerational mobility. During the past 10-15 years, economists have also contributed to this field of research, in large part on the basis of the maturing panel datasets that allow researchers to observe members of two consecutive generations at economically active ages. Examples include Couch & Dunn (1997), Björklund & Jäntti (1997), and surveys that include results from several countries, such as Solon (1999, 2002) and the papers in Corak (2004*c*). Together, these contributions provide evidence from several countries, using a variety of statistical approaches to the analysis of intergenerational mobility. The evidence suggests that, while the ordering of other countries varies, the United States and the United Kingdom tend to have higher rates of intergenerational persistence, and, hence, less socio-economic mobility than other countries. Precise statements about the ranking are typically hampered by large standard errors on the estimated parameters of interest.

International comparisons of intergenerational income mobility are intricate for at least two reasons. First, most persistence measures are highly sensitive towards exact data definitions and data collection procedures. To our knowledge, there have been few attempts to compare mobility across several countries based on a standardised methodological approach and comparable datasets.[1] Patterns in existing meta-analyses, based on comparisons of independently developed results from different countries, may therefore largely reflect differences in data structures, measurement and statistical approach rather than genuine differences in intergenerational mobility. Comparability problems motivate the adjustments made by Corak (2004*b*) in a recent literature survey. Second, there exists no single objective summary-measure of intergenerational mobility. With a few exceptions (for example, Corak & Heisz (1999), Eide & Showalter (1999), Checchi et al. (1999) or Couch & Lillard (2004)) the literature focuses almost entirely on either the elasticity of child income with respect to parental income, or the correlation of (the natural logarithm of) parent-child permanent income. Apart from being very sensitive towards the treatment of extreme observations, such summary-measures may conceal interesting differences in mobility patterns across the whole range of the bivariate income distribution, both within and across countries.

The present paper seeks to contribute to the existing literature in three important respects. First, we have made substantive efforts to provide standardised intergenerational samples for six different countries (Denmark, Finland, Norway, Sweden, the United Kingdom, and the United States). Although we cannot claim to have eliminated all possible cross-country variations in the data structures, we are confident that the resultant datasets provide a better basis

[1] The only such studies we are aware of are Björklund & Jäntti (1997), Couch & Dunn (1997), Grawe (2004) and Blanden (2005).

for comparison of the countries involved than do meta-analyses which compare estimates from different independent studies. Second, we have sought to provide a more informative and comprehensive picture of intergenerational mobility than that embodied in simple summary measures such as income correlation coefficients and elasticities. In particular, we report quintile group income mobility matrices for all six countries, and a set of supplementary summary measures based on various properties of these matrices. Finally, we equip all the mobility statistics reported in the paper, including the elements of the mobility matrices, with confidence intervals, based on bootstrap techniques. These confidence intervals and the bootstrap distributions that underlie them provide the basis for inference regarding cross-country differences.

Most of the summary measures reported in this paper lend support to the previously reported finding that the Nordic countries are characterised by significantly higher intergenerational income mobility than the United States. Interestingly, however, the United Kingdom bears a closer resemblance to the Nordic countries than to the United States. Our main finding, however, is that most of the cross-country difference that has been reported in income correlations and elasticities is confined to rather limited parts of the bivariate earnings distribution. For example, the difference between the U.K. and the Nordic countries is to a large extent caused by the low downwards male mobility from the very top to the bottom end of the earnings distribution in the U.K.. An even lower long-distance mobility from the top is found for the U.S.. However, what distinguishes the pattern of male intergenerational mobility in the U.S. most from that of all the other countries in our study is the low upwards mobility for sons from low income families in the United States.

Comparative studies of socio-economic mobility have long challenged the notion of "American exceptionalism", a term that was invoked by Tocqueville and Marx to describe what was then thought of as exceptionally hight rates of social mobility in the United States.[2] The sociological approaches, such as that based on class mobility, suggest that the United States is fairly unexceptional (Erikson & Goldthorpe 1992*a*,*b*, 2002). The economics literature, based on correlation or regression coefficients, suggests that the United States may, indeed, be exceptional, but not in having *more* mobility, but in having *less* (Solon 2002), a finding our results support. Our study, based on a more flexible approach to mobility, uncovers evidence that, while middle-class mobility may be quite similar across countries, the United States has more low-income persistence and less upward mobility than the other countries we study. Thus, we argue that "American exceptionalism" in intergenerational income mobility may need to be viewed in a new light.

[2]See Björklund & Jäntti (e.g. 2000) for a discussion in the context of international comparisons of mobility. For an empirical historical perspective, see Ferrie (2005) and also Long & Ferrie (2005)

2 Data and descriptive statistics

We exploit data for Denmark, Finland, Norway, Sweden, the United Kingdom and the United States. These countries are included in part because suitable microdata from them are available to us. They also allow for a robust comparison of the U.S. with several other countries, including one with presumably more laissez-faire social policies and the Nordic countries with their more extensive welfare states. The guiding principle for the choice of datasets and sample construction for each of these countries has been the objective of maximal similarity across countries in the kind of data required for the analysis of intergenerational earnings mobility. The key data requirements include earnings information on parents and offspring in their respective prime ages.

Our starting point for data selection is the observation that for our purposes the best dataset for the U.K. is the National Child Development Study (NCDS). This study sampled all offspring born during a particular week in 1958. The sample persons and their families have been surveyed several times since they were first drawn. The most recent sweeps are those for 1991 and 1999, providing information on the offspring's gross earnings at ages 33 and 41 years. These observations meet the criterion of observing earnings of prime age offspring. Furthermore, the 1974 sweep of the NCDS, i.e., at age 16 of the offspring, provides information on the family income of offspring's parents. We note that although we have only one observation on parental income, the point in time occurs when fathers were typically of prime age. The average age of fathers in our sample is 46 in 1974.

That income information for both generations is at a reasonably similar age and that this age is typically around the individuals' mid 30s or early 40s (in the case of offspring) or mid 40s (for fathers) is valuable to us. As several studies have shown (see, for example, Grawe 2005, Reville 1995), estimates of intergenerational earnings elasticities are highly sensitive to the age at which sons' earnings are observed, increasing substantially in age. The elasticities initially increase and then decrease with father's age. Haider & Solon (2005) demonstrate that this can be explained by the strong life-cycle pattern in the correlation between current and lifetime earnings. Björklund (1993), for example, found this correlation to be zero or negative for workers less than 25 years of age and to rise to about 0.8 only for workers over the age of 32-33. Haider & Solon (2005) show that, contrary to the assumption of the conventional errors-in-variables model, the slope coefficient from the regression of current log earnings on the log of lifetime earnings does not, in general, equal unity but, instead, is likely to be less than one early in a career. This is because an early-career comparison understates the true gap in career earnings if, as is typically the case, workers with higher lifetime earnings experience higher earnings growth rates. Their empirical results indicate that earnings should be measured at around age 40 in order for current earnings to be a reasonable proxy for lifetime earnings. In their application of the same approach to more extensive Swedish data, Böhlmark & Lindquist (2005) obtain similar results.

In order to generate country-specific data which are comparable across countries, we have sought to mimic as closely as possible the NCDS data for the other countries in our study. This means that we have compiled data on offspring born as close as possible to 1958 and for whom appropriate information on fathers is available. Ideally, we would like to have measures of lifetime income for both generations for all our countries. In the absence of this, we try to replicate for our other countries the U.K. design of observing offspring's earnings twice, at ages 33 and 41. For parental income, we have only the one observation for the U.K. – when the offspring was aged 16 – and we restrict ourselves to this in the main results section also for our other countries. Our sensitivity analysis allows us to explore the consequences of this restriction in other countries.

For Norway, we have access to information on the complete 1958 birth cohort, together with the father's earnings measured in 1974. The offspring's earnings are measured in 1992 and 1999. For Sweden, we use data on a single birth cohort: that of 1962. For this cohort, we have father's earnings measured in 1975 and offspring's in 1996 and 1999. For Denmark, the data refer to offspring born in the period 1958-1960 and on whom we use earnings information for 1998 and 2000. The fathers' earnings are measured in 1980: when the offspring are a little older than is typically the case for the other countries. For Finland, offspring are also born between 1958 and 1960 and their earnings are observed in 1993 and 2000. The father's earnings are observed in 1975. The note to Table 1 summarises the information on the years at which earnings are observed for each country.

For the United States, two data sources are available, namely the National Longitudinal Survey of Youth (NLSY) and the Panel Study of Income Dynamics (PSID). We choose to work primarily with NLSY rather than the PSID essentially because of sample size considerations. By using only small subsamples from the PSID, elasticity estimates are very much dependent on the samples. E.g. Chadwick (2002) and Lee & Solon (2004) use small samples from the PSID and show how elasticity estimates fluctuate over years and subsamples and are connected with large standard errors. They conclude that more efficient use of data based on all available birth cohorts in the PSID gives more reliable results. In our case it is impossible to use PSID efficiently, since the data sets have to resemble NCDS. In one of the few attempts to use comparable datasets, Levine & Mazumder (2002) find that the standard errors for the elasticity estimates are smaller when using NLSY than when using PSID. Consequently, they warn researchers not to rely on results based on small samples from the PSID. In our case, the standard errors in the estimates based on the PSID become large and convey information of little use for comparisons with estimates from other countries.[3]

Thus, for the U.S., we use the National Longitudinal Survey of Youth (NLSY) for offspring born between 1957 and 1964. The offspring's earnings are taken from the 1996 and 2002 surveys and refer to wages and salary income during the previous calendar year (1995 and 2001). Parental income refers to 1978. The data are described more fully in the appendix. While we feel that we have succeeded in constructing data for reasonably comparable cohorts across the different countries on which we subsequently conduct a common standardised statistic analy-

[3]Results based on the PSID have been compiled by us and are available upon request.

sis, inevitably there are data differences across countries. These are discussed in more detail below. One difference for the U.S. is that in the NLSY we have data on family income rather than on only father's income.

For all countries, we include only father-child pairs where the father is between 35 and 64 years at age 16 of the offspring (that is, in 1974 for the U.K. data).[4] The father is thus in the U.K. data born between 1910 and 1939.[5] We inflate parental income to year 2000 values, then regress the natural log of earnings in the single outcome year on a quartic polynomial in age and record the residual from that regression. We then predict what their earnings would have been had they been 40 years old, add to this their estimated residual and take the anti-log. This is the income measure used in our analyses for offspring.[6]

Much has been made of the fact that the magnitude of such least-squares coefficients appear very sensitive to exact sample definitions and, in particular, the treatment of zeros (see Couch & Lillard 1998). We have chosen not to arbitrarily assign a number where one is not defined (i.e., to the natural logarithm of 0, which some choose to define to be 1). Instead, we use in our main analysis only those pairs of offspring and fathers that contribute at least one non-zero income observation and estimate for our main results our regression and correlation coefficients using natural logarithms. We also show mobility matrices including zero observations.

We note that the same father may appear several times. For instance, if a father has two sons and two daughters in the appropriate age range, he occurs twice in the father-son sample and twice in the father-daughter sample when the mobility tables and regression and correlation coefficients are estimated. However, we include each father only once in constructing the fathers' earnings distribution and in the age correction. Thus, the mobility table is constructed based on the actual distributions of father's earnings or earnings. One implication of this is that the marginal distribution of fathers is not exactly (.20, .20, .20, .20, .20) as it would be if there was exactly one father per child.

Starting with fathers (Panel A in Table 1), we see that our Danish fathers tend to be older than the rest, with the others being on average in the range of 44 and 47 when observed with earnings. It should be borne in mind, when looking at the percentiles, that they refer to somewhat different income concepts. The U.K. numbers are net weekly income from all sources (annualised) and the U.S. number refer to family income. The Nordic countries in turn include individual earnings only. Even with that caveat, the estimated 20th, 40th, 60th and 80th earnings percentiles (i.e., quintiles 1-4) suggest that the U.S. was a lot richer than the

[4]Thus, e.g., if we use social families, the father is observed as living with his son in 1974. Further, there is some variation as to the calendar year in which the father-son relationship is established across countries. There is also variation across countries in which two years are chosen for child outcomes, the prototype being the U.K. with 1991 and 1999. The two years are, however, a few years apart and are all between 1991 and 2001.

[5]The lower age limit is to avoid teen dads (and may be unnecessary) but the upper age limit has to do with labour market age in 1974.

[6]We predict at age 40 to make offspring approximately and on average the same age as their father. Most of the sample of fathers is older than this, though. Making them the same age seems useful for the same reason as for the offspring, it makes the examination of the limits more cogent.

other countries in the early to mid 1970s.

The estimated percentile ratios, p90/p10, perhaps quite surprisingly suggest that Finland had in the early 1970s the highest level of inequality of these nations, followed by the U.S., Denmark and Norway, with the U.K. having the lowest.[7] Note that the parental income in the U.K. are grouped and net of taxes, which accounts in part for their smaller dispersion. While the ordering for the p90/p50, p10/p50 and the Gini coefficients shuffles countries around to some extent, the U.K. is always the country with least inequality, followed by Norway. The U.S. is always in 2nd or third place and Finland in 1st or 2nd.

For offspring, we also inflate the earnings to the year 2000 values, then regress the log of annual earnings on a year indicator and save the average of the OLS residual across the years for each individual. We add to this the estimated time effect in the later year (1999 for the U.K.) and take the anti-log. While excluded from the main analyses, an offspring with zero earnings in both years is assigned zero earnings. We have also conducted the analyses that include zero earning fathers and sons, the results of which are included in the appendix.[8] After adding in zeros, as appropriate, we estimate the quintiles of the newly defined age-corrected distribution of earnings and classify cases as belonging to one of five earnings quintile groups.

Panels B and C in Table 1 show selected descriptives for the offspring. Here also we have some variation in the income concept. For the Nordic countries and the U.S., we use annual earnings. In the U.K., we use gross weekly pay (annualised) and thus do not include variation due to differences in weeks worked. We focus here on the 20th, 40th, 60th and 80th percentiles of earnings, measured as the average across the two years, as well as summary inequality indices. The differences in the real earnings across the distribution are less than was the case in the fathers' generation.

Among the offspring, the inequality orderings look more like what we would expect from modern studies of income and earnings differentials, taking into account the variation in income concepts. For men, the U.S. has most inequality as measured by the p90/p10, p90/p50 rations and the Gini coefficient. Denmark, Finland and Norway tend to be close together and the U.K. has least degree of inequality. The exception to U.S.' position is the p10/p50 ratio, where the U.S. is ranked 3rd. For women, the U.S. always exhibits the most inequality whereas Denmark tends to exhibit the least. The rank of other countries varies by measure.

[7]The strikingly high level of Finnish earnings inequality is consistent with other historical evidence, which suggests that income inequality in the early 1970s were at historically high levels. It is also in part accounted for by the fact that we impose no other restrictions, such as working full time full year. If we do that, the level of earnings inequality reduces to more familiar levels.

[8]We add the estimated year effect so that the earnings quintiles have an immediate interpretation in the local currency. Technically, this only shifts the limits, but it makes for a more cogent discussion of the limits themselves. We convert all numbers to international, constant price dollars (although we still use the within-country-within-generation quintiles to delimit the classes).

Table 1 Descriptive statistics – fathers and offspring

A. Fathers

	Denmark	Finland	Norway	Sweden	UK	USNLSY
Age	50	47	48	43	46	46
	[50,50]	[47,47]	[48,48]	[42,43]	[46,46]	[46,46]
Percentiles						
20	21030	10797	18247	15994	19311	37105
	[20931,21146]	[10292,11064]	[18128,18323]	[15955,16031]	[19016,19653]	[36039,38680]
40	27077	16967	23174	18836	23578	52822
	[27034,27117]	[16747,17133]	[23105,23252]	[18800,18873]	[23417,23788]	[52804,52804]
60	31766	21208	27273	21982	27566	66028
	[31708,31817]	[20844,21230]	[27194,27340]	[21932,22038]	[27431,27664]	[65944,67265]
80	39717	28535	34152	28037	32923	92439
	[39624,39816]	[27938,29095]	[34042,34261]	[27930,28145]	[32741,33295]	[87996,93278]
Inequality						
90/10	4.996	6.875	3.406	2.641	2.274	4.231
	[4.901,5.093]	[6.221,7.527]	[3.359,3.449]	[2.623,2.660]	[2.226,2.338]	[3.802,4.575]
90/50	1.670	2.245	1.680	1.737	1.502	1.913
	[1.666,1.675]	[2.117,2.321]	[1.671,1.690]	[1.728,1.744]	[1.471,1.523]	[1.783,2.000]
10/50	0.334	0.327	0.493	0.658	0.661	0.452
	[0.328,0.341]	[0.308,0.349]	[0.489,0.499]	[0.654,0.662]	[0.645,0.674]	[0.433,0.480]
Gini	0.285	0.340	0.243	0.241	0.180	0.307
	[0.284,0.286]	[0.334,0.345]	[0.242,0.244]	[0.239,0.242]	[0.177,0.183]	[0.296,0.317]

B. Sons

	Denmark	Finland	Norway	Sweden	UK	USNLSY
Percentiles						
20	23930	11716	22560	14471	22664	20905
	[23765,24105]	[11337,12120]	[22313,22774]	[14254,14680]	[22204,23271]	[19461,22095]
40	30278	18996	28872	20830	29529	31534
	[30188,30363]	[18719,19306]	[28719,29012]	[20718,20941]	[28926,30129]	[30259,32861]
60	35647	24568	34216	24564	37163	42045
	[35541,35764]	[24176,24961]	[34034,34396]	[24471,24671]	[36335,37950]	[40243,43934]
80	45459	31733	43377	30445	47667	60218
	[45224,45665]	[31226,32243]	[43088,43678]	[30263,30600]	[46695,48747]	[57461,63540]
Inequality						
90/10	4.296	6.127	3.567	4.341	3.231	5.952
	[4.192,4.392]	[5.703,6.691]	[3.484,3.646]	[4.217,4.463]	[3.073,3.384]	[5.325,6.722]
90/50	1.706	1.780	1.705	1.623	1.831	2.217
	[1.696,1.715]	[1.745,1.820]	[1.689,1.720]	[1.610,1.637]	[1.761,1.899]	[2.085,2.389]
10/50	0.397	0.290	0.478	0.374	0.567	0.373
	[0.389,0.407]	[0.266,0.310]	[0.468,0.488]	[0.364,0.384]	[0.550,0.585]	[0.336,0.404]
Gini	0.279	0.344	0.271	0.276	0.276	0.396
	[0.277,0.281]	[0.336,0.351]	[0.265,0.276]	[0.273,0.280]	[0.264,0.288]	[0.380,0.413]
n	78131	5797	27254	32564	2205	1805

C. Daughters

	Denmark	Finland	Norway	Sweden	UK	USNLSY
Percentiles						
20	16324	7871	10583	8959	7234	9145
	[16168,16490]	[7540,8184]	[10412,10738]	[8831,9063]	[6895,7617]	[7930,10189]
40	23374	13489	16487	13409	11887	17554
	[23306,23448]	[13126,13777]	[16348,16637]	[13316,13502]	[11427,12334]	[16205,18595]
60	27521	17775	21522	16730	17673	26060
	[27446,27599]	[17529,18043]	[21391,21655]	[16643,16826]	[16923,18429]	[25075,27331]
80	32943	22048	27038	20753	26354	39601
	[32851,33055]	[21820,22340]	[26875,27195]	[20630,20857]	[25361,27166]	[37787,41658]
Inequality						
90/10	3.965	6.243	5.009	4.593	7.347	12.884
	[3.876,4.052]	[5.780,6.790]	[4.849,5.165]	[4.468,4.730]	[6.705,7.958]	[10.393,15.650]
90/50	1.488	1.663	1.652	1.626	2.333	2.308
	[1.481,1.494]	[1.623,1.706]	[1.637,1.665]	[1.613,1.638]	[2.225,2.442]	[2.154,2.496]
10/50	0.375	0.266	0.330	0.354	0.318	0.179
	[0.367,0.383]	[0.246,0.286]	[0.320,0.340]	[0.344,0.364]	[0.296,0.345]	[0.147,0.218]
Gini	0.253	0.323	0.298	0.284	0.382	0.440
	[0.252,0.255]	[0.315,0.331]	[0.295,0.301]	[0.281,0.287]	[0.370,0.396]	[0.419,0.459]
n	73803	5450	25574	30901	2348	1614

Note: Earnings have been adjusted to 2000 prices and converted to 2000 international U.S. dollars using OECD's PPP exchange rate for that year. Fathers are between 35-64 years of age and earnings are measured in Denmark in 1980, Finland in 1975, Norway in 1974, Sweden in 1975, U.K. in 1974 and the U.S. in 1978. The sons and daughters are born in Denmark: 1958-1960, Finland: 1958-60, Norway: 1958, Sweden: 1962, U.K.: 1958 and the U.S.: 1957-1964 and their earnings are measured in Denmark: 1998 and 2000, Finland: 1995 and 2000, Norway: 1992 and 1999, Sweden: 1996 and 1999, U.K.: 1991 and 1999, U.S.: 1995 and 2001. The youngest offspring are 30 and oldest 42 in the years earnings are measured. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval.

3 Methods

Persistence versus mobility

Many important insights into the comparative patterns of intergenerational inequality have been gained from studying the intergenerational elasticity (i.e., the regression coefficient in a log-log regression) or the correlation coefficient in the log incomes of the offspring and the parent(s). These two both have their benefits. The correlation coefficient is a measure of association between variables whose dispersion has been standardized and can be useful when the marginal distribution has changed substantially across time. The elasticity of offspring income with respect to that of the father is a well understood measure of conditional expectation in log incomes.

The elasticity is, however, a measure of average *persistence* of income rather than of *mobility*. In other words, the regression coefficient on father's log (permanent) earnings tells us how closely related, on average, an offspring's economic status is to that of his or her parent. It is quite possible for two countries to have highly similar average peristence, but for one to have substantially more mobility around that average persistence. The elasticity can thus be the same, but arguably the country with a greater residual variation – that is, variability around the average persistence – is the one with greater mobility. Moreover, two countries with the same regression slope may have quite different, and varying, conditional variances around that slope. For instance, a country with a "bulge" in the variance at low levels of fathers' earnings, that is, a pear-shaped bivariate distribution, will exhibit relatively more mobility at the low end of the distribution than will a country with a constant conditional variance.

One approach is to examine both the regression coefficients and residual variances. We use a more direct method of comparison, however, based on quintile group mobility matrices. In allowing for fairly general patterns of mobility, mobility matrices offer the additional advantage of allowing for asymmetric patterns – more mobility at the top than at the bottom, say. Other approaches, such as non-parametric bivariate density estimates, would in principle be available (see e.g. Bowles & Gintis 2002). Since these typically require a large number of observations to work well and some of our data sets are fairly small, these are not an option here.

Choice of summary mobility index

To facilitate comparisons across countries, we compute summary measures of mobility based on the estimated quintile group mobility matrices. Bartholomew (1982), Checchi et al. (1999) and Fields & Ok (1999) review mobility indices based on mobility / transition matrices. The choice of measures is a non-trivial task, but we rely on fairly standard indices. Formally, let the $(k \times k)$ mobility matrix P have elements p_{ij} for which $\sum_j p_{ij} \equiv 1$. Ideally, a mobility index $M(P) \in [0,1]$ should satisfy $0 \equiv M(I_k) < M(P) < M(PM) < 1$, where PM is the "perfect mobility" matrix. Not all measures suggested in the literature satisfy the bounds of 0 and

1. The "perfect mobility" matrix *could* be taken to be $M(p_{ij} \equiv 1/k \forall i, j)$, i.e., the mobility matrix with independence of origin and destination (each destination is equally likely). This is the usual standard of comparison, and the one that we use here. Alternatively, it could be one matrix in the class for which $p_{ii} \equiv 0$ (in which nobody remains in their class of origin). This class would have maximal mobility if for every row (save the first and the last), the probabilities in the cells that are in the first and last columns sum to one and are zero elsewhere (in the first and last columns the anti-diagonal elements would both be one).

The *trace index*, M_T is based on the sum of the off-the-main-diagonal elements of a mobility matrix:

$$M_T = \frac{k - tr(P)}{k-1}. \tag{1}$$

One index, M_L is based on the second largest eigenvalue λ_2 of the mobility matrix:

$$M_L = 1 - |\lambda_2(P)| \tag{2}$$

which takes the value of one if the mobility matrix assigns equal probability to all transitions (or, more generally, if each row is equal to the limiting distribution [which in our case is 0.2 in each cell]). The index M_F is based on a direct comparison of the limiting distribution and the mobility matrix, defined to be

$$M_F = 1 - \frac{1}{k^2} \sum_i \sum_j \left| \frac{p_{ij}}{k^{-1}} - 1 \right|. \tag{3}$$

Finally, one index suggested by Bartholomew (1982) measures the expected number of classes to be moved across:

$$M_B = \sum_i \sum_j p_{ij} p_i |i - j|. \tag{4}$$

Statistical inference

We include for all our estimates the estimated confidence intervals. Since we estimate some quite complex statistics, such as (5×5) mobility matrices and summary measures based on these, and even for simpler cases rely on fairly complex standardisation procedures, we rely throughout the paper on bootstrap estimates of the sampling variability of our statistics (see Davison & Hinkley 1997).

Some of the statistics we study, such as the correlation coefficient or the intergenerational elasticity, have well-known sampling distributions. Others do not. For instance, in estimating the elements in the mobility matrix, there is some extra variation that is due to the fact that we estimate quintiles of the two income distributions simultaneously with the conditional probabilities that constitute the mobility matrix. As these estimators have complex or even unknown sampling distributions, we have chosen to use a simple re-sampling technique, the bootstrap, to simulate the sampling distributions of all statistics. We re-sample even those statistics which have known distributions as we may be interested in the joint distribution of two statistics, such as the regression coefficient and the trace index. Bootstrapping provides us with a multivariate sampling distribution.

To assess the extent to which sampling errors account for the ordering of countries, we first check if the confidence intervals for a specific parameter in two different countries overlap.[9] If not, we take this as evidence that the statistic in the two countries are different. In the cases where the confidence intervals overlap for a substantively interesting comparison, performing a proper statistical test on the difference would require us to pool the microdata. However, our Nordic data sets are by domestic law and by the practice of the Nordic statistical agencies not allowed to travel and not all pairwise comparisons can be done. That means that advanced methods of testing for whether a statistic estimated in two different samples is different or not, such as permutation tests or re-sampling from the two samples directly, are not available to us. Instead, we rely on a procedure for approximating the two-sample test that we outline below.

Whatever statistical tests we do, we must rely on the bootstrap distributions for our statistics to do them. The estimators in different countries are independent of each other. We could, in principle, assume asymptotic normality for both of the estimators and use a standard t-test on the difference between two estimated means. Many of the statistics we have estimated are restricted to the unit interval and whether or not asymptotic normality is appropriate likely varies across countries, as our sample sizes are very different.

The strategy we choose instead is as follows – see Figure 1. Suppose we estimate the value of a statistic $\theta \in \Theta$ in two countries, indexed by 1 and 2, by $\widehat{\theta}_j \equiv \bar{x}_j$ and we observe that $\bar{x}_1 < \bar{x}_2$. The null hypothesis is that $\theta_1 = \theta_2$. The problem is that the equality $\theta_1 = \theta_2$ can occur in a range of values of Θ – indeed, it could in the most general case take any value on the real line. We must take into account the range of values in assessing the probability of observing the difference we do, conditional on the null of equality holding. Denoting by z the values that our estimator can have, we take as our alternative hypothesis the *opposite* of what we observe, namely that $\bar{x}_1 \geq z \cap \bar{x}_2 < z$. We must then take into account the joint likelihood of $\bar{x}_1 \geq z \cap \bar{x}_2 < z$ at all possible values of z.

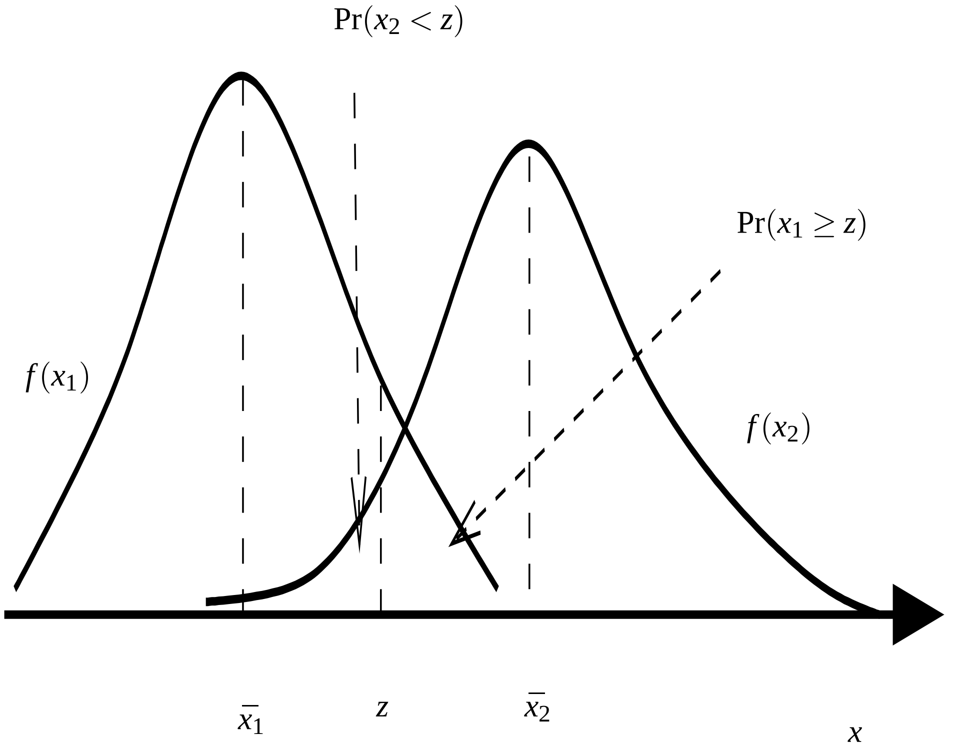
The estimators apply to two different country data sets and are independent. From their independence it follows that the likelihood of the event that $\bar{x}_1 \geq z \cap \bar{x}_2 < z$ is the product of $\Pr(x_1 \geq z) \times \Pr(x_2 < z)$ (see Panel A in Figure 1). An evaluation of this probability over all values of z is in a loose sense a test of the null hypothesis that the two parameters are equal against the one-sided alternative that $\theta_2 < \theta_1$. We report this probability that the ordering of the countries would be the opposite of what we observe as the p-value in our result tables.

Panel B in Figure 1 shows how we proceed to evaluate the likelihood of observing $\bar{x}_1 \geq z \cap \bar{x}_2 < z$ for all possible values of z. The figure shows the x_1, x_2 plane. All points below the 45 degree line, where equal $z = x_1 = x_2$ are such that $x_2 < x_1$. We must therefore evaluate the likelihood of observing combinations of x_1, x_2 in that region. Any point x_1, x_2 is associated

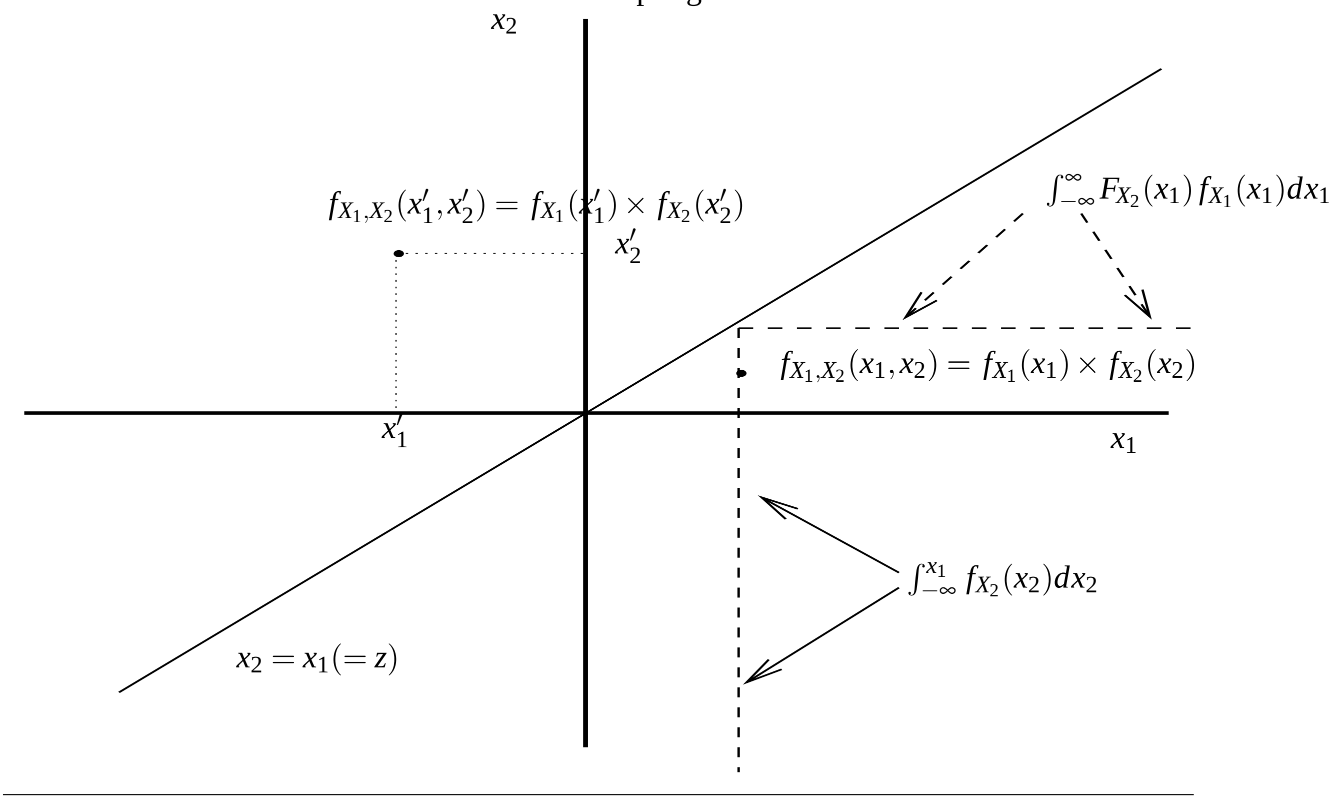
[9] There are several ways to construct a bootstrap confidence interval. We use the empirical percentiles corrected for bias.

Figure 1 Statistical inference for independently distributed statistics

A. The univariate sampling distributions



B. The bivariate sampling distribution



with the joint density $f_{X_1,X_2}(x_1,x_2)$. Since X_1,X_2 are independent, this joint density is the product of the marginals, $f_{X_1}(x_1)\times f_{X_2}(x_2)$. This means that we can evaluate the likelihood of observing $x_2 < x_1$ as

$$\Pr(\bar{x_2} < \bar{x_1}) = \int_{-\infty}^{\infty}\int_{-\infty}^{x_1} f_{X_2}(x_2)\, f_{X_1}(x_1) dx_2 dx_1 \tag{5}$$

We integrate along the vertical line across values of x_2 up until x_1 in Panel B of the Figure 1 to get:

$$\begin{aligned}\Pr(\bar{x_2} < \bar{x_1}) = &= \int_{-\infty}^{\infty}\int_{-\infty}^{x_1} f_{X_2}(x_2) dx_2\, f_{X_1}(x_1) dx_1 \\ &= \int_{-\infty}^{\infty} F_{X_2}(x_1)\, f_{X_1}(x_1) dx_1\end{aligned} \tag{6}$$

We then integrate the value of the "vertical" integral across all values of x_1:

$$\Pr(\bar{x_2} < \bar{x_1}) = \mathbf{E}_{X_1}[F_{X_2}]. \tag{7}$$

Equation 7 says that the likelihood that $\bar{x_2} < \bar{x_1}$ is the expectation of the cumulative density function of X_2 with respect to the distribution of X_1. Our strategy is to use the bootstrap distributions to estimate the densities involved and use numerical integration over a pointwise two-dimensional grid of values to evaluate the empirical probability of observing $\bar{x_2} < \bar{x_1}$ for interesting pairwise comparisons. These empirical probabilities are our p-values.

In implementing our test procedures, we make no allowance for the fact that we conduct multiple tests on the same statistics. Moreover, we ignore the fact that tests on different parameters are correlated. Nonetheless, we believe our procedure conveys useful information of the role of sampling error in our cross-country comparisons.

4 Intergenerational earnings persistence and mobility

In this section, we start by showing estimated intergenerational earnings elasticities and correlations for the parent-child pairs in order to contrast our findings with the previous literature. We then proceed to report our main contribution, the estimated quintile group mobility matrices and mobility statistics based on these. The section includes additional results aimed at examining if the sample restrictions and data choices that are in part dictated by the inclusion of the U.K. data affects our results.

Regression and correlation coefficients

We show in Table 2 the estimated log earnings elasticities and correlation coefficients for father-offspring pairs with positive earnings in at least one year. Focusing first on men, we note that the elasticity and correlation coefficients offer a clear and mostly consistent ordering

Table 2 Pairwise comparisons for selected parameters – regression and correlation coefficients

Elasticity β

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.071 [0.064,0.079]	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Fi	0.173 [0.135,0.211]	.	$>_{ol}$ (21.9)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
No	0.155 [0.137,0.174]	.	.	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Sw	0.258 [0.234,0.281]	.	.	.	$<_{ol}$ (8.4)	$<$ (0.0)
UK	0.306 [0.242,0.370]	.	.	.	.	$<$ (0.0)
US	0.517 [0.444,0.590]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.034 [0.027,0.041]	$<$ (1.1)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Fi	0.080 [0.042,0.118]	.	$<_{ol}$ (7.4)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
No	0.114 [0.090,0.137]	.	.	$<$ (0.0)	$<$ (0.0)	$<$ (0.1)
Sw	0.191 [0.166,0.216]	.	.	.	$<$ (1.0)	$<_{ol}$ (4.4)
UK	0.331 [0.223,0.440]	.	.	.	.	$>_{ol}$ (27.1)
US	0.283 [0.181,0.385]	.	.	.	.	.

Correlation $\beta\sigma_P/\sigma_O$

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.089 [0.079,0.099]	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Fi	0.157 [0.128,0.186]	.	$>_{ol}$ (12.7)	$>_{ol}$ (15.9)	$<_{ol}$ (5.9)	$<$ (0.0)
No	0.138 [0.123,0.152]	.	.	$<_{ol}$ (38.7)	$<$ (0.4)	$<$ (0.0)
Sw	0.141 [0.129,0.152]	.	.	.	$<$ (0.4)	$<$ (0.0)
UK	0.198 [0.156,0.240]	.	.	.	.	$<$ (0.0)
US	0.357 [0.306,0.409]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.045 [0.036,0.054]	$<_{ol}$ (3.9)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Fi	0.074 [0.045,0.103]	.	$<_{ol}$ (28.0)	$<_{ol}$ (3.6)	$<_{ol}$ (0.6)	$<$ (0.4)
No	0.084 [0.070,0.099]	.	.	$<_{ol}$ (3.6)	$<$ (0.9)	$<$ (0.5)
Sw	0.102 [0.090,0.113]	.	.	.	$<_{ol}$ (4.3)	$<_{ol}$ (2.2)
UK	0.141 [0.099,0.183]	.	.	.	.	$<_{ol}$ (30.3)
US	0.160 [0.105,0.215]	.	.	.	.	.

Note: See sections 2 and 3 for definitions of the data. These results include only non-zero observations of both offspring and father. Regressions are in log form. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval. The entries after the 1st column show the direction of the difference between the estimate for the country in the row and the column, i.e., $\hat{\theta}_{\text{row}} - \hat{\theta}_{\text{column}}$, where $<, >$ denote a negative and a positive difference, respectively. The *ol* in $<_{ol}, >_{ol}$ denotes cases where the confidence intervals for $\hat{\theta}_{\text{row}}$ and $\hat{\theta}_{\text{column}}$ overlap. The number in parentheses is the probability, in percentage terms, of the *opposite* order of what has in fact been observed. If $\hat{\theta}_{\text{row}} > \hat{\theta}_{\text{column}}$, this is the probability, in light of the estimated sampling distribution, that $\hat{\theta}_{\text{row}} < \hat{\theta}_{\text{column}}$.

of intergenerational mobility. The Nordic countries have the highest and United States the lowest level of mobility. The United Kingdom lies between the two. The differences between the U.S., the U.K. and the Nordic countries are mostly statistically significant, as can clearly be verified by the non-overlapping (95 per cent) confidence intervals. The four Nordic countries are very similar, perhaps with slightly higher mobility in Denmark and Norway than in Finland and Sweden – although the Norway-Finland comparison turns out not to be statistically significant. At this point, our results confirm what previous studies have found.

There is one exception where the difference in earnings persistence between Nordic countries and the U.K. fails to be significant. The point estimates of the elasticities for Sweden and the U.K. are $\widehat{\theta}_{\text{SW}} = 0.258$ and $\widehat{\theta}_{\text{UK}} = 0.306$ and their difference is $\Delta\widehat{\theta}_{\text{UK-SW}} = 0.048$. In light of the estimated sampling distributions for these two independent random variables, we estimate the probability of the region in which, contrary to what the point estimates suggest, $\widehat{\theta}_{\text{SW}} > \widehat{\theta}_{\text{UK}}$. This probability, our equation 5, turns out to be 8.4 percent. While low, it is higher than the conventional rejection probability of 5 percent so we do not reject the null that they are the same.

The Swedish elasticity of 0.258 suggests that intergenerational mobility is lower in Sweden compared to the other Nordic countries. One reason for the high estimate, however, is that the general inequality in the incomes distribution has increased more in Sweden than in the other countries (as measured by the ratio of variances). Ceteris paribus, a general increase in inequality (from the parent to the offspring generation) raises the incomes elasticity, but not the correlation coefficient.

Moving to the correlation coefficients, the differences among the Nordic countries are rarely statistically significant, except that Denmark always exhibits higher mobility. However, all pairwise comparisons of a Nordic country with either the U.K or the U.S are significant, as are the findings that the regression and correlation coefficients in the U.K. are lower than those in the U.S.

For women, our estimates of the differences between countries are much smaller. The ordering of countries is more or less the same as for men, but the estimates are less precise and the confidence intervals are no longer consistently non-overlapping. Intergenerational mobility is highest in the Nordic countries, lowest in the U.S, and somewhere between in the U.K. Again, the Swedish elasticity estimate is somewhat higher than in the other Nordic countries, reflecting a general rise in income inequality from the father to the daughter generation. From the pair-wise comparisons we find that both elasticities and correlations are significantly lower for the Nordic countries than for the U.K. or and U.S. estimates. Comparing U.S. with the U.K. there is no statistically significant difference in the intergenerational mobility for the daughters.

Our linear model results are broadly in line with those found for sons in previous studies. More than twenty estimates have been produced for U.S. men during the last fifteen years and elasticities seem to cluster in the region 0.35 - 0.5, Solon (2002), Corak (2004*a*), although a recent study suggests even higher persistence, Mazumder (2005). While few studies consider women, Chadwick & Solon (2002) report estimates in the range of 0.35-0.49, based on family income, somewhat lower than the corresponding estimate for sons.

The first U.K. elasticity estimate of 0.36 based on weekly earnings, from sons of the city of York, Atkinson (1981), Atkinson et al. (1983) is very similar to ours. The high estimate of 0.57 in Dearden et al. (1997) is commonly cited as an indicator of intergenerational mobility in the U.K., but this is an IV-estimate using father's schooling as an instrument. Acknowledging the upward bias likely to be involved, recent U.K. studies like Blanden et al. (2004) use standard least squares and report elasticities somewhat below ours for the 1958 cohort, 0.18 for sons and 0.31 for daughters. As we both use the NCDS data, the divergence reflects in part the fact that we use data for older offspring, including outcomes at age 41 and not only at 33.

For Sweden, Björklund & Jäntti (1997) report an (IV) estimate for father-son pairs of 0.28 and elasticities in more recent studies based on register data are similar, (e.g. 0.24 in Björklund & Chadwick 2003). Earlier estimates of intergenerational income elasticity in Finland are in the same range as in this paper. The individuals in the sample in Österbacka (2001) are born during 1950-1960, and observed three times when they are between 25 and 45. The elasticity estimates are 0.13 for pairs of father-son and 0.10 for father-daughter pairs. In Pekkala & Lucas (2005), the elasticity estimates for offspring born 1958-1960 is 0.23 for sons and 0.17 for daughters. They observe earnings for the offspring in many years, between ages of 25 and 59. For the parent's generation, they use mean parental taxable income. Recent Norwegian studies include Bratberg et al. (2005) who report an intergenerational elasticity of 0.13 for both sons and daughters born in 1960. For Denmark, Eriksson et al. (2005) report a significantly higher estimate of 0.29 for both genders, when offspring wage earnings are measured at age 47. Unlike most other Nordic studies, these are based on a survey data. Bonke et al. (2005), who restrict both offpsring and parental age much like we do, but use a 5-year average of father's earnings, report an elasticity of .240 for men and .204 for women.

Mobility matrices and summary indices

We now examine the income quintile group transition matrices and the indices that are based on these. The full mobility tables, based also on samples that include zero earners (in both generations) are shown in the appendix. To facilitate comparison of intergenerational mobility across countries, we focus on mobility matrices, i.e., we look at how the children are distributed *conditional* on father's status.[10] Table 3 reports summary measures of intergenerational mobility based on the quintile mobility matrices as well as all pairwise cross-country comparisons for each these indices.

For men, all four summary measures identify the United States as the country with least

[10]The unconditional cross tabulations are available from the authors on request. The U.S. data, based as on surveys with varying sampling probabilities, supply sampling weights that should be used to generate unbiased estimates. We use those but rescale the weights to sum to sample rather than population size. Thus, for these data sets the raw counts in the appendix can take non-integer values even if they sum (approximately) to the actual number of underlying cases.

Table 3 Pairwise comparisons for selected parameters – mobility matrix indices

Mobility index: M_T

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.923 [0.919,0.928]	$<_{ol}$ (32.3)	$>_{ol}$ (39.9)	$<_{ol}$ (19.8)	$<_{ol}$ (13.8)	$>$ (0.0)
Fi	0.928 [0.912,0.944]	.	$>_{ol}$ (28.2)	$>_{ol}$ (48.3)	$<_{ol}$ (26.1)	$>$ (0.0)
No	0.922 [0.916,0.929]	.	.	$<_{ol}$ (16.6)	$<_{ol}$ (12.3)	$>$ (0.0)
Sw	0.927 [0.921,0.933]	.	.	.	$<_{ol}$ (20.9)	$>$ (0.0)
UK	0.938 [0.913,0.962]	.	.	.	.	$>$ (0.0)
US	0.857 [0.822,0.892]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.945 [0.941,0.950]	$<_{ol}$ (17.6)	$<_{ol}$ (6.8)	$<_{ol}$ (4.1)	$>_{ol}$ (32.7)	$>_{ol}$ (24.9)
Fi	0.954 [0.937,0.970]	.	$>_{ol}$ (43.8)	$>_{ol}$ (45.1)	$>_{ol}$ (17.4)	$>_{ol}$ (15.7)
No	0.952 [0.945,0.959]	.	.	$<_{ol}$ (48.3)	$>_{ol}$ (16.4)	$>_{ol}$ (16.0)
Sw	0.952 [0.946,0.958]	.	.	.	$>_{ol}$ (15.5)	$>_{ol}$ (15.5)
UK	0.940 [0.916,0.963]	.	.	.	.	$>_{ol}$ (36.5)
US	0.932 [0.894,0.969]	.	.	.	.	.

Mobility index: M_L

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.776 [0.767,0.785]	$<_{ol}$ (8.3)	$<_{ol}$ (41.3)	$>_{ol}$ (43.1)	$<_{ol}$ (49.2)	$>$ (0.0)
Fi	0.804 [0.759,0.848]	.	$>_{ol}$ (10.9)	$>_{ol}$ (7.8)	$>_{ol}$ (24.1)	$>$ (0.0)
No	0.778 [0.764,0.791]	.	.	$>_{ol}$ (36.2)	$<_{ol}$ (52.3)	$>$ (0.0)
Sw	0.774 [0.761,0.787]	.	.	.	$<_{ol}$ (46.9)	$>$ (0.0)
UK	0.787 [0.695,0.878]	.	.	.	.	$>_{ol}$ (0.1)
US	0.653 [0.594,0.711]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.834 [0.825,0.843]	$<_{ol}$ (11.6)	$<_{ol}$ (4.6)	$<_{ol}$ (20.2)	$<_{ol}$ (33.6)	$>_{ol}$ (22.8)
Fi	0.858 [0.817,0.899]	.	$>_{ol}$ (36.0)	$>_{ol}$ (22.2)	$<_{ol}$ (59.6)	$>_{ol}$ (15.2)
No	0.849 [0.835,0.863]	.	.	$>_{ol}$ (23.0)	$<_{ol}$ (52.9)	$>_{ol}$ (17.0)
Sw	0.841 [0.828,0.855]	.	.	.	$<_{ol}$ (43.2)	$>_{ol}$ (19.8)
UK	0.864 [0.764,0.963]	.	.	.	.	$>_{ol}$ (18.4)
US	0.798 [0.675,0.921]	.	.	.	.	.

Mobility index: M_F

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.832 [0.823,0.840]	$<_{ol}$ (43.3)	$>_{ol}$ (39.2)	$>_{ol}$ (0.5)	$>_{ol}$ (37.4)	$>$ (0.0)
Fi	0.834 [0.810,0.857]	.	$>_{ol}$ (37.2)	$>_{ol}$ (7.5)	$>_{ol}$ (35.0)	$>$ (0.0)
No	0.829 [0.818,0.841]	.	.	$>_{ol}$ (2.9)	$>_{ol}$ (42.5)	$>$ (0.0)
Sw	0.815 [0.805,0.824]	.	.	.	$<_{ol}$ (28.9)	$>$ (0.0)
UK	0.825 [0.790,0.860]	.	.	.	.	$>$ (0.1)
US	0.718 [0.669,0.768]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.869 [0.860,0.877]	$<_{ol}$ (7.8)	$<$ (0.1)	$<_{ol}$ (3.0)	$>_{ol}$ (49.9)	$>$ (1.0)
Fi	0.887 [0.864,0.910]	.	$<_{ol}$ (35.8)	$>_{ol}$ (34.6)	$>_{ol}$ (18.8)	$>$ (0.3)
No	0.892 [0.881,0.903]	.	.	$>_{ol}$ (8.6)	$>_{ol}$ (9.3)	$>$ (0.1)
Sw	0.881 [0.871,0.891]	.	.	.	$>_{ol}$ (23.7)	$>$ (0.3)
UK	0.868 [0.835,0.901]	.	.	.	.	$>_{ol}$ (2.6)
US	0.808 [0.757,0.858]	.	.	.	.	.

Mobility index: M_B

A. Men

	Estimate	Fi	No	Sw	UK	US
De	1.373 [1.363,1.382]	$<_{ol}$ (39.1)	$>_{ol}$ (8.5)	$>_{ol}$ (26.7)	$>_{ol}$ (49.1)	$>$ (0.0)
Fi	1.378 [1.344,1.411]	.	$>_{ol}$ (17.8)	$>_{ol}$ (29.2)	$>_{ol}$ (42.4)	$>$ (0.0)
No	1.360 [1.346,1.374]	.	.	$<_{ol}$ (23.4)	$<_{ol}$ (34.9)	$>$ (0.0)
Sw	1.367 [1.355,1.380]	.	.	.	$<_{ol}$ (45.4)	$>$ (0.0)
UK	1.372 [1.323,1.421]	.	.	.	.	$>$ (0.0)
US	1.198 [1.133,1.264]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	1.434 [1.424,1.444]	$<_{ol}$ (6.0)	$<_{ol}$ (1.3)	$<_{ol}$ (3.1)	$<_{ol}$ (24.6)	$>_{ol}$ (10.2)
Fi	1.463 [1.429,1.497]	.	$>_{ol}$ (32.0)	$>_{ol}$ (23.8)	$>_{ol}$ (35.6)	$>_{ol}$ (3.2)
No	1.454 [1.440,1.469]	.	.	$>_{ol}$ (33.8)	$>_{ol}$ (47.1)	$>_{ol}$ (3.7)
Sw	1.450 [1.437,1.462]	.	.	.	$<_{ol}$ (48.2)	$>_{ol}$ (4.7)
UK	1.451 [1.404,1.499]	.	.	.	.	$>_{ol}$ (7.2)
US	1.383 [1.308,1.459]	.	.	.	.	.

Note: For all the mobility indices greater values suggest greater mobility. See equations 1 to 4 for definitions and interpretation. See Table 2 for an explanation of the structure of the entries.

intergenerational income mobility. But apart from this finding, there appear to be only relatively small differences between the various countries, and the ranking is to some extent measure-dependent. In particular, it is no longer the case that the U.K. is unambiguously placed between the U.S. and the Nordic countries. Regardless of which of the matrix-based measures one looks at, the U.K. is not significantly different from the Nordic countries. For women, the picture is even more blurred. The only crystal-clear result is that there is less intergenerational mobility in the U.S. than in the other countries. For men, this difference is in every case statistically significant. For women, it is more often the case that the difference fails to be significant at conventional levels. Note also that the Nordic ranking differs from the linear model. Denmark is not highest and Sweden not necessarily the highest.

We now turn to the estimated mobility matrices. The full mobility matrices, both excluding zero father-offspring pairs and including them, are shown in Tables 12- 15 in the Appendix. First, for men, the Nordic countries are relatively similar in all parts of the bivariate father-offspring earnings distribution. In particular, approximately 25 per cent of sons born into the poorest quintile remain in that position themselves, while around 10-15 per cent reach the very top quintile (compared to the 20 per cent who would have ended up in each of these two states if the distribution of offspring earnings was completely random). The bottom-to-top mobility is significantly larger in Denmark than in the other Nordic countries. The persistence of very high incomes is much larger than the persistence of very low incomes in all the Nordic countries – around 35 per cent of sons born into the richest quintile remain in that position.

An interesting set of cross-country differences emerge from the study of the extreme cells, or "corners" of the mobility matrix, shown for both sons and daughters in Table 4. Comparing the Nordic matrices with those of the U.S., there is one difference that immediately stands out as significant, substantively as well as statistically, and that is the much lower upwards mobility out of the poorest quintile group in the U.S. More than 40 per cent of U.S. males born into this position remain there. For this away-from-the-bottom mobility measure, the U.K. is much more similar to the Nordic countries than to the U.S.. The probability that the son of a lowest-quintile father makes it into the top quintile group – "rags-to-riches" mobility – is lower in the U.S. than in all other countries, statistically significantly so for Denmark, Norway and the U.K. These two findings – higher low-income persistence and a lower likelihood of rags-to-riches mobility – seem to us quite powerful evidence against the traditional notion of American exceptionalism consisting of a greater rate of upward social mobility than in other countries. In light of this evidence, the U.S. appears to be exceptional in having less rather than more upward mobility.

Another interesting difference between the U.S. and the Nordic countries is that of top-to-bottom downwards mobility. Fewer than 10 per cent of U.S. males born into the richest quintile take the step all the way down to the bottom quintile, while this is typically the case for around 15 per cent of Nordic males. And at this point, the U.K. is more similar to the U.S. than to the Nordic countries. As pointed out already by Atkinson (1981, p 213), there is less long-distance mobility down from the top than there is upward mobility from the bottom.

Table 4 Pairwise comparisons for selected parameters – conditional probability of being in the extreme diagonal and antidiagonal cells

Pr(Offspring in lowest quintile group| Father in lowest group)

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.247 [0.240,0.254]	$<_{ol}$ (1.3)	$<$ (0.0)	$<_{ol}$ (4.1)	$<$ (0.3)	$<$ (0.0)
Fi	0.278 [0.253,0.303]	.	$<_{ol}$ (39.8)	$>_{ol}$ (8.0)	$<_{ol}$ (14.9)	$<$ (0.0)
No	0.282 [0.272,0.292]	.	.	$>$ (0.0)	$<_{ol}$ (16.0)	$<$ (0.0)
Sw	0.258 [0.248,0.267]	.	.	.	$<_{ol}$ (1.4)	$<$ (0.0)
UK	0.303 [0.264,0.342]	.	.	.	.	$<$ (0.0)
US	0.422 [0.362,0.481]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.235 [0.228,0.243]	$<_{ol}$ (44.0)	$>_{ol}$ (47.7)	$<_{ol}$ (28.3)	$>_{ol}$ (45.1)	$<_{ol}$ (25.2)
Fi	0.238 [0.212,0.264]	.	$>_{ol}$ (42.5)	$<_{ol}$ (48.2)	$>_{ol}$ (40.7)	$<_{ol}$ (29.6)
No	0.235 [0.224,0.246]	.	.	$<_{ol}$ (28.8)	$>_{ol}$ (46.2)	$<_{ol}$ (24.6)
Sw	0.239 [0.230,0.249]	.	.	.	$>_{ol}$ (37.2)	$<_{ol}$ (29.5)
UK	0.232 [0.196,0.268]	.	.	.	.	$<_{ol}$ (24.7)
US	0.256 [0.201,0.310]	.	.	.	.	.

Pr(Offspring in highest quintile group| Father in lowest group)

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.144 [0.138,0.150]	$>$ (0.3)	$>$ (0.0)	$>$ (0.0)	$>_{ol}$ (8.0)	$>$ (0.0)
Fi	0.113 [0.094,0.133]	.	$<_{ol}$ (27.8)	$>_{ol}$ (35.2)	$<_{ol}$ (31.6)	$>_{ol}$ (5.2)
No	0.119 [0.111,0.128]	.	.	$>_{ol}$ (3.3)	$<_{ol}$ (44.1)	$>_{ol}$ (1.6)
Sw	0.109 [0.101,0.116]	.	.	.	$<_{ol}$ (20.4)	$>_{ol}$ (5.4)
UK	0.122 [0.093,0.152]	.	.	.	.	$>_{ol}$ (3.5)
US	0.079 [0.044,0.113]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.160 [0.153,0.166]	$>_{ol}$ (2.1)	$>$ (0.4)	$>_{ol}$ (0.3)	$<_{ol}$ (47.3)	$>$ (0.2)
Fi	0.136 [0.113,0.158]	.	$<_{ol}$ (27.5)	$<_{ol}$ (22.3)	$<_{ol}$ (9.9)	$>_{ol}$ (4.6)
No	0.143 [0.134,0.153]	.	.	$<_{ol}$ (39.8)	$<_{ol}$ (14.2)	$>$ (1.6)
Sw	0.145 [0.137,0.153]	.	.	.	$<_{ol}$ (16.5)	$>$ (1.3)
UK	0.162 [0.130,0.194]	.	.	.	.	$>_{ol}$ (0.8)
US	0.097 [0.062,0.132]	.	.	.	.	.

Pr(Offspring in lowest quintile group| Father in highest group)

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.153 [0.146,0.159]	$>_{ol}$ (43.0)	$>_{ol}$ (12.2)	$<_{ol}$ (3.5)	$>$ (0.1)	$>$ (0.3)
Fi	0.151 [0.129,0.173]	.	$>_{ol}$ (37.1)	$<_{ol}$ (17.1)	$>_{ol}$ (0.8)	$>_{ol}$ (1.0)
No	0.146 [0.137,0.155]	.	.	$<_{ol}$ (0.4)	$>$ (0.5)	$>$ (0.8)
Sw	0.163 [0.154,0.171]	.	.	.	$>$ (0.0)	$>$ (0.1)
UK	0.107 [0.079,0.134]	.	.	.	.	$>_{ol}$ (32.2)
US	0.095 [0.055,0.135]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.172 [0.165,0.179]	$>_{ol}$ (49.9)	$>_{ol}$ (46.8)	$>_{ol}$ (10.0)	$>_{ol}$ (1.2)	$<_{ol}$ (39.7)
Fi	0.172 [0.148,0.196]	.	$>_{ol}$ (50.3)	$>_{ol}$ (30.3)	$>_{ol}$ (3.3)	$<_{ol}$ (40.4)
No	0.171 [0.162,0.181]	.	.	$>_{ol}$ (16.2)	$>_{ol}$ (1.5)	$<_{ol}$ (38.9)
Sw	0.165 [0.156,0.173]	.	.	.	$>_{ol}$ (3.7)	$<_{ol}$ (30.4)
UK	0.134 [0.103,0.166]	.	.	.	.	$<_{ol}$ (8.8)
US	0.180 [0.123,0.237]	.	.	.	.	.

Pr(Offspring in highest quintile group| Father in highest group)

A. Men

	Estimate	Fi	No	Sw	UK	US
De	0.363 [0.356,0.371]	$>_{ol}$ (13.4)	$>_{ol}$ (11.3)	$<_{ol}$ (10.4)	$>$ (0.1)	$>_{ol}$ (48.2)
Fi	0.347 [0.321,0.374]	.	$<_{ol}$ (32.5)	$<_{ol}$ (5.2)	$>_{ol}$ (1.9)	$<_{ol}$ (36.6)
No	0.354 [0.343,0.366]	.	.	$<_{ol}$ (1.7)	$>$ (0.3)	$<_{ol}$ (44.0)
Sw	0.371 [0.361,0.381]	.	.	.	$>$ (0.0)	$>_{ol}$ (37.6)
UK	0.297 [0.259,0.335]	.	.	.	.	$<_{ol}$ (5.1)
US	0.360 [0.297,0.422]	.	.	.	.	.

B. Women

	Estimate	Fi	No	Sw	UK	US
De	0.320 [0.312,0.327]	$>_{ol}$ (34.7)	$>_{ol}$ (18.3)	$<_{ol}$ (29.0)	$>_{ol}$ (20.5)	$<_{ol}$ (32.3)
Fi	0.313 [0.287,0.340]	.	$>_{ol}$ (49.6)	$<_{ol}$ (25.6)	$>_{ol}$ (33.5)	$<_{ol}$ (27.2)
No	0.313 [0.302,0.324]	.	.	$<_{ol}$ (9.9)	$>_{ol}$ (32.0)	$<_{ol}$ (25.6)
Sw	0.323 [0.313,0.334]	.	.	.	$>_{ol}$ (15.9)	$<_{ol}$ (36.4)
UK	0.303 [0.265,0.341]	.	.	.	.	$<_{ol}$ (19.8)
US	0.338 [0.270,0.407]	.	.	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

The probability that the son of a rich father remains in that group is highest in the U.S. and lowest in the U.K., but not statistically significantly so. The persistence of high earnings is very similar in the U.S. and the Nordic countries.

In more central parts of the bivariate income distributions, as shown in Tables 12- 15 in the Appendix, all six countries are remarkably similar, a point we shall return to in our concluding comments. Hence, we conclude that most of the difference reflected in elasticity and correlation measures discussed above reflect the phenomenon that mobility out of the lowest earnings quintile group is much lower in the U.S. than in the other countries, and that mobility from the top to the bottom of the earnings distributions is lower in both the U.S. and the U.K. than in the Nordic countries.

For daughters, the picture is again much more blurred, and most differences between countries are not statistically significant at conventional significance levels. A point to note, however, is that daughters born into poor families in the U.S. have a much higher probability of climbing up the income distribution than their brothers have. The out-of-poverty mobility for women is almost at the same level as for the other five countries, i.e. around 75 per cent. However, very few of them (around 9 per cent according to the point estimate) reach the very top quintile. This bottom-to-top mobility seems to be higher in all the other countries (around 15 per cent). Apart from this, there are only minor differences between the mobility matrices for the different countries.

In conclusion, a fairly rich picture emerges from an examination of the transition probabilities combined with the elasticities and correlations. Admittedly, the comparable data that we could construct suffer from the well-known short-coming that having only a single year of parental income data tends to bias the estimated elasticities downward. The bias may well vary across countries and is likely to affect the mobility tables as well. However, a comparison of our regression-based results suggest the same ordering as other within-country studies, where this bias has been reduced. The mobility matrices enrich our picture of the orderings generated by the elasticities and correlations, in particular in allowing us to examine persistence and movements in various parts of the distribution.

Sensitivity analyses

This section contains results from several sensitivity checks. We show that some potentially crucial limitations imposed by the U.K. data do not have serious implications for our cross country comparisons. First, a single year of earnings is, of course, a noisy measure of permanent earnings. Since we have but a single year of parental earnings, we know our regression coefficients are likely to be downward-inconsistent estimates of the population parameters.[11] The impact of such attenuation bias on the cross-country comparisons can be assessed by

[11]This is not necessarily a reason for preferring mobility matrices, however, as measurement errors in earnings lead to both biased estimates of the percentiles (depending on the exact type of measurement error) and to classification error. It is possible that, as in the regression coefficient case, use of annual rather than long-run incomes lead us to underestimate mobility.

means of extended data for the United States and the Nordic countries. We find it unlikely that the Nordic-U.S. differential is explained by measurement error, since it would require that Nordic register data were less reliable than the self-reported U.S. measure of parental income. Moreover, transitory earnings shocks are unlikely to be more important in countries with less wage dispersion and lower unemployment.

Our expectation is lent support by the results in Tables 5–7, where we have replaced the single year observation with the average of two years of parental income for the United States, Finland, Sweden and Norway. For Sweden and Finland, we build on earnings observations five years apart, in the census years 1970 and 1975. For Norway, we report an eight-year average of annual earnings, but the Norwegian results are not very sensitive to the exact number of years. For the NLSY, we include a two-year average of father's family income. In all cases, our data are unbalanced, i.e., we use all cases that contribute at least one valid income observation. Focusing on males, we find higher regression coefficients in all countries, except Norway where the estimate is about the same (Table 5).[12] Most important, the ordering of countries remains intact and the magnitude of the cross-country differences are hardly affected. As the dispersion of parental earnings falls when we use a two year average, the correlation coefficient is less affected than the elasticity and it actually drops for two of our four countries.

A two-year average of family income raises the value of the mobility matrix-based indices in Table 6 for the U.S. males and they drop a little for the Nordic countries. Thus, the differences between the Nordic countries and the U.S. are now smaller than before, but the Nordic countries still display significantly more mobility than the U.S.. Finally, examination of the four "corners" of the mobility matrix (Table 7) still suggests that the U.S. has the greatest persistence of poverty, has lower extreme movements and has slightly greater persistence of riches. The main difference is that our comparisons across countries of the probability that the son of a poor father ends up in the top quintile group ("rags-to-riches") no longer provide unambiguous evidence. The confidence intervals remain overlapping, but the upward long-distance mobility is lower, albeit not statistically significantly so, in the U.S. than in Sweden, Norway and Finland.

For women, the earnings persistence, measured by regression and correlation coefficients, are higher in all countries but the comparative perspective on Nordic countries vis a vis the United States remains. Just like in our base case, no firm conclusions can be drawn from the mobility indices and matrices.

The second issue relates to weekly versus annual earnings for the offspring generation. While the literature typically provides evidence using annual measures, only weekly earnings are available for the U.K.. Since adult unemployment is no doubt related to family background and the unemployment insurance replacement ratio is below unity, one might expect that the effect on annual earnings exceeds the effect on weekly earnings. The former also captures the

[12] In Norway, there are two different issues. Lengthening the time-period during which father's are observed would lead to a smaller transitory variance, but this also allows for a less restrictive sample, allowing for greater heterogeneity.

Table 5 Sensitivity analysis using multi-year average of parental income: Pairwise comparisons for selected parameters – regression and correlation coefficients

Elasticity β

A. Men

	Estimate	No	Sw	US
Fi	0.213 [0.172,0.253]	$>$ (0.4)	$<_{ol}$ (1.7)	$<$ (0.0)
No	0.150 [0.132,0.168]	.	$<$ (0.0)	$<$ (0.0)
Sw	0.267 [0.241,0.293]	.	.	$<$ (0.0)
US	0.531 [0.456,0.606]	.	.	.

B. Women

	Estimate	No	Sw	US
Fi	0.099 [0.061,0.137]	$<_{ol}$ (16.8)	$<$ (0.0)	$<$ (0.0)
No	0.121 [0.099,0.143]	.	$<$ (0.0)	$<$ (0.1)
Sw	0.204 [0.179,0.229]	.	.	$<_{ol}$ (4.0)
US	0.307 [0.200,0.415]	.	.	.

Correlation $\beta\sigma_P/\sigma_O$

A. Men

	Estimate	No	Sw	US
Fi	0.179 [0.150,0.208]	$>_{ol}$ (1.5)	$>_{ol}$ (1.0)	$<$ (0.0)
No	0.142 [0.127,0.157]	.	$>_{ol}$ (45.1)	$<$ (0.0)
Sw	0.140 [0.128,0.153]	.	.	$<$ (0.0)
US	0.347 [0.303,0.391]	.	.	.

B. Women

	Estimate	No	Sw	US
Fi	0.087 [0.059,0.114]	$<_{ol}$ (34.7)	$<_{ol}$ (11.3)	$<_{ol}$ (1.7)
No	0.093 [0.079,0.107]	.	$<_{ol}$ (9.9)	$<_{ol}$ (1.9)
Sw	0.105 [0.094,0.116]	.	.	$<_{ol}$ (4.5)
US	0.153 [0.101,0.205]	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

Table 6 Sensitivity analysis using multi-year average of parental income: Pairwise comparisons for selected parameters – mobility matrix indices

Mobility index: M_T

A. Men

	Estimate	No	Sw	US
Fi	0.926 [0.910,0.941]	$>_{ol}$ (20.0)	$>_{ol}$ (18.0)	$>$ (0.3)
No	0.918 [0.911,0.925]	.	$>_{ol}$ (47.0)	$>$ (0.5)
Sw	0.918 [0.912,0.924]	.	.	$>$ (0.5)
US	0.872 [0.838,0.905]	.	.	.

B. Women

	Estimate	No	Sw	US
Fi	0.955 [0.939,0.971]	$>_{ol}$ (31.9)	$>_{ol}$ (22.3)	$>_{ol}$ (18.3)
No	0.951 [0.944,0.958]	.	$>_{ol}$ (31.0)	$>_{ol}$ (23.1)
Sw	0.949 [0.943,0.955]	.	.	$>_{ol}$ (27.1)
US	0.937 [0.900,0.973]	.	.	.

Mobility index: M_B

A. Men

	Estimate	No	Sw	US
Fi	1.362 [1.329,1.394]	$>_{ol}$ (15.8)	$>_{ol}$ (32.4)	$>$ (0.0)
No	1.343 [1.329,1.357]	.	$<_{ol}$ (16.1)	$>$ (0.0)
Sw	1.353 [1.340,1.366]	.	.	$>$ (0.0)
US	1.201 [1.138,1.264]	.	.	.

B. Women

	Estimate	No	Sw	US
Fi	1.454 [1.420,1.489]	$>_{ol}$ (27.2)	$>_{ol}$ (22.5)	$>_{ol}$ (4.3)
No	1.442 [1.427,1.458]	.	$>_{ol}$ (41.3)	$>_{ol}$ (6.0)
Sw	1.440 [1.427,1.453]	.	.	$>_{ol}$ (6.7)
US	1.384 [1.313,1.455]	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

Table 7 Sensitivity analysis using multi-year average of parental income: Pairwise comparisons for selected parameters – conditional probability of being in the extreme diagonal and antidiagonal cells

Pr(Offspring in lowest quintile group| Father in lowest group)

A. Men	Estimate	No	Sw	US	B. Women	Estimate	No	Sw	US
Fi	0.282 [0.256,0.307]	$<_{ol}$ (30.1)	$>_{ol}$ (25.3)	$<$ (0.1)	Fi	0.243 [0.218,0.268]	$>_{ol}$ (48.6)	$<_{ol}$ (50.0)	$>_{ol}$ (51.2)
No	0.290 [0.279,0.300]	.	$>_{ol}$ (0.9)	$<$ (0.1)	No	0.242 [0.231,0.253]	.	$<_{ol}$ (44.0)	$<_{ol}$ (49.8)
Sw	0.272 [0.262,0.281]	.	.	$<$ (0.0)	Sw	0.244 [0.234,0.253]	.	.	$>_{ol}$ (50.8)
US	0.379 [0.326,0.431]	.	.	.	US	0.243 [0.191,0.295]	.	.	.

Pr(Offspring in highest quintile group| Father in lowest group)

A. Men	Estimate	No	Sw	US	B. Women	Estimate	No	Sw	US
Fi	0.119 [0.099,0.138]	$>_{ol}$ (32.4)	$>_{ol}$ (5.6)	$>_{ol}$ (13.2)	Fi	0.129 [0.107,0.150]	$<_{ol}$ (23.6)	$<_{ol}$ (29.5)	$>_{ol}$ (12.4)
No	0.113 [0.105,0.121]	.	$>_{ol}$ (2.0)	$>_{ol}$ (16.9)	No	0.138 [0.128,0.147]	.	$>_{ol}$ (37.3)	$>_{ol}$ (4.2)
Sw	0.102 [0.094,0.109]	.	.	$>_{ol}$ (38.3)	Sw	0.135 [0.127,0.144]	.	.	$>_{ol}$ (5.1)
US	0.096 [0.062,0.129]	.	.	.	US	0.102 [0.064,0.140]	.	.	.

Pr(Offspring in lowest quintile group| Father in highest group)

A. Men	Estimate	No	Sw	US	B. Women	Estimate	No	Sw	US
Fi	0.145 [0.123,0.167]	$>_{ol}$ (43.0)	$<_{ol}$ (5.6)	$>_{ol}$ (3.0)	Fi	0.176 [0.152,0.200]	$>_{ol}$ (26.0)	$>_{ol}$ (18.3)	$<_{ol}$ (47.9)
No	0.142 [0.134,0.151]	.	$<$ (0.0)	$>_{ol}$ (2.4)	No	0.167 [0.157,0.177]	.	$>_{ol}$ (32.8)	$<_{ol}$ (34.7)
Sw	0.165 [0.157,0.174]	.	.	$>$ (0.1)	Sw	0.164 [0.156,0.172]	.	.	$<_{ol}$ (30.3)
US	0.102 [0.065,0.139]	.	.	.	US	0.178 [0.128,0.228]	.	.	.

Pr(Offspring in highest quintile group| Father in highest group)

A. Men	Estimate	No	Sw	US	B. Women	Estimate	No	Sw	US
Fi	0.353 [0.326,0.380]	$<_{ol}$ (42.0)	$<_{ol}$ (8.6)	$<_{ol}$ (31.4)	Fi	0.319 [0.291,0.346]	$>_{ol}$ (37.3)	$<_{ol}$ (26.3)	$<_{ol}$ (33.8)
No	0.357 [0.346,0.368]	.	$<_{ol}$ (1.7)	$<_{ol}$ (34.6)	No	0.313 [0.302,0.324]	.	$<_{ol}$ (2.4)	$<_{ol}$ (26.6)
Sw	0.373 [0.363,0.383]	.	.	$>_{ol}$ (46.3)	Sw	0.329 [0.319,0.339]	.	.	$<_{ol}$ (44.9)
US	0.370 [0.312,0.427]	.	.	.	US	0.334 [0.273,0.395]	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

Table 8 Sensitivity analysis on using weekly incomes: Pairwise comparisons for selected parameters

Regression and correlation

A. Men / **B. Women**

Elasticity β

A. Men

	Estimate	US
UK	0.306 [0.242,0.370]	$<$ (0.1)
US	0.462 [0.394,0.529]	.

B. Women

	Estimate	US
UK	0.331 [0.223,0.440]	$>_{ol}$ (9.2)
US	0.237 [0.154,0.319]	.

Correlation $\beta\sigma_P/\sigma_O$

A. Men

	Estimate	US
UK	0.198 [0.156,0.240]	$<$ (0.0)
US	0.354 [0.300,0.409]	.

B. Women

	Estimate	US
UK	0.141 [0.099,0.183]	$<_{ol}$ (27.2)
US	0.163 [0.108,0.217]	.

Mobility indices

Regression and correlation

Mobility index: M_T

A. Men

	Estimate	US
UK	0.938 [0.913,0.962]	$>_{ol}$ (3.6)
US	0.898 [0.863,0.932]	.

B. Women

	Estimate	US
UK	0.940 [0.916,0.963]	$<_{ol}$ (16.6)
US	0.961 [0.926,0.996]	.

Mobility index: M_B

A. Men

	Estimate	US
UK	1.372 [1.323,1.421]	$>$ (0.0)
US	1.213 [1.146,1.281]	.

B. Women

	Estimate	US
UK	1.451 [1.404,1.499]	$>_{ol}$ (4.7)
US	1.375 [1.302,1.447]	.

The conditional corner probabilities

A. Men / **B. Women**

Pr(Offspring in lowest quintile group| Father in lowest group)

A. Men

	Estimate	US
UK	0.303 [0.264,0.342]	$<_{ol}$ (4.8)
US	0.362 [0.306,0.418]	.

B. Women

	Estimate	US
UK	0.232 [0.196,0.268]	$>_{ol}$ (44.8)
US	0.227 [0.177,0.277]	.

Pr(Offspring in highest quintile group| Father in lowest group)

A. Men

	Estimate	US
UK	0.122 [0.093,0.152]	$>_{ol}$ (6.4)
US	0.085 [0.050,0.120]	.

B. Women

	Estimate	US
UK	0.162 [0.130,0.194]	$>$ (0.3)
US	0.094 [0.062,0.126]	.

Pr(Offspring in lowest quintile group| Father in highest group)

A. Men

	Estimate	US
UK	0.107 [0.079,0.134]	$>_{ol}$ (4.9)
US	0.067 [0.031,0.103]	.

B. Women

	Estimate	US
UK	0.134 [0.103,0.166]	$<_{ol}$ (48.8)
US	0.137 [0.088,0.186]	.

Pr(Offspring in highest quintile group| Father in highest group)

A. Men

	Estimate	US
UK	0.297 [0.259,0.335]	$<_{ol}$ (28.7)
US	0.318 [0.260,0.377]	.

B. Women

	Estimate	US
UK	0.303 [0.265,0.341]	$<_{ol}$ (45.2)
US	0.309 [0.240,0.379]	.

Note: See Table 2 for an explanation of the structure of the entries.

impact from family background on weeks of paid work during the year. When, for the U.S., we divide annual earnings by the reported number of weeks worked during the last year, we do find lower estimates of intergenerational earnings persistence, in Table 8. (Note that reliable register information on hours worked per year among adult men in the 1970s is not available in the Nordic countries.) For example, the elasticity for men drops from 0.517 to 0.466, but the earnings persistence remains significantly higher in the U.S. than in the U.K..

Turning to the mobility measures, the two indices confirm the result of higher mobility in the U.K., although with a p-value of 3.6 percent for the trace index, M_T. For the corners of the mobility matrix we find that persistence is lower and mobility is higher in the U.S. when we use of weekly earnings for sons. This suggests that a intergenerational disadvantage in the U.S. may show up in working time and in unemployment. This further implies that our base case tends to exaggerate the difference in mobility between the U.K. and the U.S.. On the other hand, this also suggests that the differences between the U.K. and the Nordic countries are larger, since the use of weekly earnings tends to give lower persistence and more mobility than measures based on annual outcomes. For women, there is no clear U.K.-U.S. pattern when we use weekly earnings as different measures give opposite results.

Table 9 Sensitivity analysis on using family income: Pairwise comparisons for selected parameters – regression and correlation coefficients

Elasticity β

A. Men

	Estimate	No	Sw	UK	US
Fi	0.220 [0.181,0.260]	$>$ (0.0)	$>_{ol}$ (25.1)	$<_{ol}$ (1.3)	$<$ (0.0)
No	0.133 [0.117,0.148]	.	$<$ (0.0)	$<$ (0.0)	$<$ (0.0)
Sw	0.204 [0.179,0.229]	.	.	$<$ (0.2)	$<$ (0.0)
UK	0.306 [0.242,0.370]	.	.	.	$<$ (0.0)
US	0.517 [0.444,0.590]	.	.	.	.

B. Women

	Estimate	No	Sw	UK	US
Fi	0.112 [0.074,0.150]	$<_{ol}$ (44.4)	$<_{ol}$ (2.3)	$<$ (0.0)	$<$ (0.1)
No	0.116 [0.096,0.136]	.	$<_{ol}$ (0.3)	$<$ (0.0)	$<$ (0.1)
Sw	0.159 [0.136,0.183]	.	.	$<$ (0.2)	$<_{ol}$ (1.0)
UK	0.331 [0.223,0.440]	.	.	.	$>_{ol}$ (27.1)
US	0.283 [0.181,0.385]	.	.	.	.

Correlation $\beta\sigma_P/\sigma_O$

A. Men

	Estimate	No	Sw	UK	US
Fi	0.190 [0.160,0.219]	$>$ (0.0)	$>$ (0.0)	$<_{ol}$ (37.8)	$<$ (0.0)
No	0.126 [0.113,0.140]	.	$>_{ol}$ (32.0)	$<$ (0.1)	$<$ (0.0)
Sw	0.122 [0.109,0.135]	.	.	$<$ (0.0)	$<$ (0.0)
UK	0.198 [0.156,0.240]	.	.	.	$<$ (0.0)
US	0.357 [0.306,0.409]	.	.	.	.

B. Women

	Estimate	No	Sw	UK	US
Fi	0.100 [0.072,0.128]	$>_{ol}$ (32.8)	$>_{ol}$ (31.6)	$<_{ol}$ (6.2)	$<_{ol}$ (3.2)
No	0.093 [0.079,0.106]	.	$>_{ol}$ (49.0)	$<_{ol}$ (2.0)	$<_{ol}$ (1.0)
Sw	0.092 [0.080,0.104]	.	.	$<_{ol}$ (1.8)	$<$ (1.0)
UK	0.141 [0.099,0.183]	.	.	.	$<_{ol}$ (30.3)
US	0.160 [0.105,0.215]	.	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

The third check is related to the unit for which earnings are measured in the parents' generation. In the Nordic countries economic resources during childhood and adolescence is measured by the father's labour earnings while family income from all sources are available for the U.S. and U.K.. Income information on 'other sources' are not available in Nordic registers of the 1970s, but we have replaced father's earnings with the sum of both parents for

Table 10 Sensitivity analysis on using family income: Pairwise comparisons for selected parameters – mobility matrix indices

Mobility index: M_T

A. Men

	Estimate	No	Sw	UK	US
Fi	0.913 [0.897,0.929]	$<_{ol}$ (6.0)	$<$ (0.0)	$<_{ol}$ (5.3)	$>$ (0.3)
No	0.927 [0.920,0.934]	.	$<$ (0.0)	$<_{ol}$ (21.0)	$>$ (0.0)
Sw	0.943 [0.937,0.949]	.	.	$>_{ol}$ (33.3)	$>$ (0.0)
UK	0.938 [0.913,0.962]	.	.	.	$>$ (0.0)
US	0.857 [0.822,0.892]	.	.	.	.

B. Women

	Estimate	No	Sw	UK	US
Fi	0.954 [0.937,0.971]	$>_{ol}$ (37.2)	$<_{ol}$ (46.4)	$>_{ol}$ (16.8)	$>_{ol}$ (15.1)
No	0.951 [0.944,0.958]	.	$<_{ol}$ (18.0)	$>_{ol}$ (19.1)	$>_{ol}$ (17.6)
Sw	0.955 [0.949,0.961]	.	.	$>_{ol}$ (10.5)	$>_{ol}$ (12.4)
UK	0.940 [0.916,0.963]	.	.	.	$>_{ol}$ (36.5)
US	0.932 [0.894,0.969]	.	.	.	.

Mobility index: M_B

A. Men

	Estimate	No	Sw	UK	US
Fi	1.325 [1.294,1.356]	$<$ (0.3)	$<$ (0.0)	$<_{ol}$ (5.8)	$>$ (0.1)
No	1.372 [1.358,1.386]	.	$<$ (0.0)	$<_{ol}$ (52.2)	$>$ (0.0)
Sw	1.414 [1.402,1.427]	.	.	$>_{ol}$ (5.4)	$>$ (0.0)
UK	1.372 [1.323,1.421]	.	.	.	$>$ (0.0)
US	1.198 [1.133,1.264]	.	.	.	.

B. Women

	Estimate	No	Sw	UK	US
Fi	1.446 [1.412,1.481]	$>_{ol}$ (27.3)	$<_{ol}$ (19.9)	$<_{ol}$ (44.1)	$>_{ol}$ (7.2)
No	1.434 [1.419,1.449]	.	$<$ (0.3)	$<_{ol}$ (25.5)	$>_{ol}$ (10.3)
Sw	1.463 [1.450,1.476]	.	.	$>_{ol}$ (33.5)	$>_{ol}$ (2.2)
UK	1.451 [1.404,1.499]	.	.	.	$>_{ol}$ (7.2)
US	1.383 [1.308,1.459]	.	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

Finland, Norway and Sweden and make new comparisons with the base case estimates for the U.K and U.S, in Tables 9 – 11. For men, the elasticities as well as correlations are lowered for Norway and Sweden. In Finland, however, persistence becomes more similar to what we find in the U.K. and is significantly lower than in the U.S. only. Turning again to mobility measures for men, the indices still show that mobility in the Nordic countries is higher than in the U.S., but not significantly different from the U.K. The "corners" of the mobility matrix for males suggests the same ordering of countries as in our base case. For women, the results are unchanged if we use the sum of parents' earnings rather than father's earnings.

We have conducted a further sensitivity check (numbers not reported here), namely that of excluding from the U.S. data those father-offspring pairs who belong to minority groups, i.e., blacks and hispanics. The probability that the white, non-hispanic son of a lowest quintile group father remains poor is only marginally lower than for the full sample (.381 compared to base case .422) and still substantially higher than for the U.K. or the Nordic countries. The regression elasticity is a little higher. We conclude that it is not the inclusion of racial minorities in the U.S. data that accounts for its greater intergenerational income persistence.

In all cross-country studies based on the construction of national evidence from different data-generating processes, comparability is crucial. The sensitivity analyses show that our central conclusions hold and are not sensitive to the particular data differences we have identified.

Table 11 Sensitivity analysis on using family income: Pairwise comparisons for selected parameters – conditional probability of being in the extreme diagonal and antidiagonal cells

Pr(Offspring in lowest quintile group| Father in lowest group)

	A. Men Estimate	No	Sw	UK	US	B. Women Estimate	No	Sw	UK	US
Fi	0.281 [0.255,0.306]	$<_{ol}$ (50.0)	$>_{ol}$ (2.2)	$<_{ol}$ (18.0)	$<$ (0.0)	0.224 [0.200,0.249]	$<_{ol}$ (25.5)	$<_{ol}$ (20.7)	$<_{ol}$ (37.4)	$<_{ol}$ (16.1)
No	0.281 [0.270,0.292]	.	$>$ (0.0)	$<_{ol}$ (15.0)	$<$ (0.0)	0.234 [0.223,0.245]	.	$<_{ol}$ (41.2)	$>_{ol}$ (47.5)	$<_{ol}$ (23.9)
Sw	0.253 [0.243,0.262]	.	.	$<$ (0.7)	$<$ (0.0)	0.236 [0.227,0.246]	.	.	$>_{ol}$ (43.4)	$<_{ol}$ (26.0)
UK	0.303 [0.264,0.342]	.	.	.	$<$ (0.0)	0.232 [0.196,0.268]	.	.	.	$<_{ol}$ (24.7)
US	0.422 [0.362,0.481]	.	.	.	.	0.256 [0.201,0.310]	.	.	.	.

Pr(Offspring in highest quintile group| Father in lowest group)

	A. Men Estimate	No	Sw	UK	US	B. Women Estimate	No	Sw	UK	US
Fi	0.105 [0.086,0.124]	$<_{ol}$ (3.8)	$<_{ol}$ (14.6)	$<_{ol}$ (17.7)	$>_{ol}$ (10.2)	0.140 [0.118,0.162]	$>_{ol}$ (36.0)	$<_{ol}$ (46.3)	$<_{ol}$ (14.1)	$>_{ol}$ (3.1)
No	0.124 [0.115,0.133]	.	$>_{ol}$ (8.9)	$>_{ol}$ (47.0)	$>$ (0.9)	0.135 [0.125,0.145]	.	$<_{ol}$ (17.6)	$<_{ol}$ (5.8)	$>_{ol}$ (3.5)
Sw	0.116 [0.109,0.123]	.	.	$<_{ol}$ (35.9)	$>_{ol}$ (2.2)	0.141 [0.133,0.149]	.	.	$<_{ol}$ (11.1)	$>$ (1.9)
UK	0.122 [0.093,0.152]	.	.	.	$>_{ol}$ (3.5)	0.162 [0.130,0.194]	.	.	.	$>_{ol}$ (0.8)
US	0.079 [0.044,0.113]	.	.	.	.	0.097 [0.062,0.132]	.	.	.	.

Pr(Offspring in lowest quintile group| Father in highest group)

	A. Men Estimate	No	Sw	UK	US	B. Women Estimate	No	Sw	UK	US
Fi	0.138 [0.117,0.158]	$<_{ol}$ (22.3)	$<$ (0.5)	$>_{ol}$ (4.1)	$>_{ol}$ (3.5)	0.159 [0.135,0.182]	$<_{ol}$ (46.2)	$<_{ol}$ (33.4)	$>_{ol}$ (11.8)	$<_{ol}$ (25.4)
No	0.147 [0.138,0.156]	.	$<$ (0.1)	$>$ (0.4)	$>$ (0.8)	0.160 [0.151,0.170]	.	$<_{ol}$ (28.0)	$>_{ol}$ (6.5)	$<_{ol}$ (25.7)
Sw	0.169 [0.160,0.177]	.	.	$>$ (0.0)	$>$ (0.0)	0.164 [0.156,0.173]	.	.	$>_{ol}$ (3.8)	$<_{ol}$ (30.2)
UK	0.107 [0.079,0.134]	.	.	.	$>_{ol}$ (32.2)	0.134 [0.103,0.166]	.	.	.	$<_{ol}$ (8.8)
US	0.095 [0.055,0.135]	.	.	.	.	0.180 [0.123,0.237]	.	.	.	.

Pr(Offspring in highest quintile group| Father in highest group)

	A. Men Estimate	No	Sw	UK	US	B. Women Estimate	No	Sw	UK	US
Fi	0.362 [0.336,0.388]	$>_{ol}$ (5.7)	$>_{ol}$ (3.5)	$>$ (0.4)	$>_{ol}$ (49.8)	0.328 [0.302,0.355]	$>_{ol}$ (36.9)	$>_{ol}$ (7.9)	$>_{ol}$ (14.8)	$<_{ol}$ (42.1)
No	0.338 [0.327,0.349]	.	$>_{ol}$ (36.9)	$>_{ol}$ (2.3)	$<_{ol}$ (25.7)	0.323 [0.311,0.335]	.	$>_{ol}$ (2.5)	$>_{ol}$ (16.7)	$<_{ol}$ (36.0)
Sw	0.335 [0.326,0.345]	.	.	$>_{ol}$ (3.0)	$<_{ol}$ (23.0)	0.307 [0.298,0.317]	.	.	$>_{ol}$ (43.0)	$<_{ol}$ (20.1)
UK	0.297 [0.259,0.335]	.	.	.	$<_{ol}$ (5.1)	0.303 [0.265,0.341]	.	.	.	$<_{ol}$ (19.8)
US	0.360 [0.297,0.422]	.	.	.	.	0.338 [0.270,0.407]	.	.	.	.

Note: See Table 2 for an explanation of the structure of the entries.

5 Concluding comments

There is a substantial recent literature on the extent of intergenerational earnings mobility for different countries. We identify two significant shortcomings with much of this literature, however. First, for the most part this literature examines the extent of earnings persistence across generations by the estimation of simple parent-child elasticities and correlations. We know far less about the detailed nature of mobility and persistence at different points of the bivariate distributions. Second, and perhaps more importantly, very few studies are explicitly comparative in construction, relying instead on a comparison of estimates drawn from independent country-specific studies. The current paper has attempted to extend the existing literature by addressing both of these issues. Analysing both traditional elasticities and the rather more general mobility patterns that are possible in a quintile group mobility matrix, we examine how mobility patterns vary across countries when we impose on the data and analysis as much similarity across countries as possible.

Our results suggest that all countries exhibit substantial earnings persistence across generations, but with statistically significant differences across countries among men, not women. Mobility among men is lower in the U.S. than in the U.K., where it is lower again compared to the Nordic countries. Surprisingly, we find that most of the cross-country difference in income correlations and elasticities is confined to rather limited parts of the bivariate earnings distribution: persistence is most pronounced in the tails of the distributions. For example, the difference between the U.K. and the Nordic countries is to a large extent associated with the lower downwards male mobility from the very top to the bottom end of the earnings distribution in the U.K.. An even lower long-distance mobility from the top is found for the United States.

The main driver of the difference in the pattern of male intergenerational mobility in the U.S. from that of each of the other countries in our study is the low mobility out of the lowest quintile group in the United States. Indeed, it is very noticeable that while for all of the other countries persistence is particularly high in the upper tails of the distribution, in the U.S. this is reversed - with a particularly high likelihood that sons of the poorest fathers in the U.S. will remain in the lowest earnings quintile. We view this as a challenge to the popular notion of an "American exceptionalism" in economic mobility. Indeed, the combination of a high probability of American sons of the poorest fifth of fathers remaining in the lowest quintile group, the lower probability of "rags-to-riches" (poorest to richest) and slightly lower probability of "riches-to-rags" (richest to poorest), places the notion of American exceptionalism in a new light. The U.S., or at least the population of young U.S. men, seems to be distinguished from other countries by having greater low-income persistence, rather than less, having fewer very large positional changes across generations, rather than more, and possibly having a greater persistence of high income, rather than less.

While we are driven to make some non-ideal choices for our sample – using a single-year average of parental income, weekly income and family income in place of father's income –

our sensitivity checks suggest that these are not responsible for our country orderings and that the main results established in the paper remain intact.

It is intriguing to speculate about why the U.S. public appears to believe the U.S. has more, not less, social and economic mobility than other advanced nations. One reason that may account for the widespread belief is that it is the middle classes who primarily hold this belief. An insightful article on this matter in the Financial Times a few years ago (Griffith 2001) suggests that the poor in the U.S. are fully aware of their low chances of upward mobility but the middle classes believe social mobility is prevalent. Our data may offer an insight into how such a belief may be sustained. Namely, the "middle" of our moblity matrix, consisting of the inner 3×3 matrix, is remarkably similar across countries, suggesting that the U.S. middle classes are quite as likely to be mobile as those in the U.K. or the Nordic countries. In the U.S., such middle class moves are associated with fairly substantial changes in real living standards (i.e., measured in actual dollars earned). We speculate that the fact that such changes in living standards are experienced or witnessed by a substantial fraction of the U.S. population may account for the widely held belief of substantial mobility. Because this substantial fraction of the U.S. population includes the median voter, such attitudes might help explain why there is not more political pressure for mobility-promoting policies in the country (cf. Alesina & Glaeser 2004, ch. 3).

Finally, we note that international comparisons of intergenerational mobility are often motivated by the light they may shed on the mechanisms behind transmission of socio-economic outcomes across generations. Such knowledge would in turn inform public policy interventions designed to decrease intergenerational inequities. The understanding of the mechanisms behind mobility should also be informed about *where* in the distribution we have great persistence. Our results suggest that increases in overall mobility would most likely occur from interventions designed to increase the mobility of the very poorest.

A Country data descriptions

Denmark The Danish data emanate from a longitudinal database, IDA, which contains detailed register information about individuals' labour market status and earnings for each year during the period 1980-2000 for all people resident in Denmark in those years, and which has been merged with the so called fertility database which provides detailed demographic information about the individuals, their biological parents and siblings. The sons and daughters are born in 1958-60, and their earnings are measured in 1998 and 2000. The fathers of the offspring are 35-64 years of age when their earnings are measured in 1980. The earnings measure includes wages, salaries and self-employment income and the source of this information is tax registers.

Finland The present Finnish data available come from the quinquennial census panel covering the period 1970 to 2000. Attached to this data set, is labor market statistics from the years 1987-2001. Information from registers have been used whenever possible, and completely since 1990. The data set covers a representative sample of Finnish residents in 1970, and follows them and their household members over the years, always gathering new household members who either move in with or are born to original panel members (see Eriksson & Jäntti 1997).

We use the Census definition of a family in 1975 to define the father-offspring relation. We choose those father-offspring pairs where the children were born between 1958 and 1960 and where the father was between 36 and 64 years old. The mean age of the fathers in 1975 is 47. The earnings measure equals wages and salaries plus self-employment income and stem from tax records. The earnings of the father are measured in 1975, when the children were between 15 and 17 years old. The earnings of the offspring are measured in 1993 and in 2000. In the first wave, the offspring are 33-35 years old and in the second wave, they are 40-42 years old (see (see Statistics Finland 2001).

Norway The Norwegian sample consists of the complete 1958 birth cohort, excluding foreign born later residents, offspring of immigrants and those who died before year 2000. Fatherhood is biological and given by the official birth register. A small proportion of cohort members with a father without recorded earnings in any of the years 1967-2001 or educational attainment in the official education register, are also excluded. Finally, the sample is restricted to cohort members with a father aged 35-64 when fathers earnings is measured in 1974. Earnings are from administrative records collected from tax returns and other government agencies. Earnings are annual, before tax/deductions and include wages, self-employment income, unemployment benefits and sick-leave payments. Capital income, social assistance, pensions and other transfers are not included. Fathers earnings are measured at age 16, i.e. annual earnings in 1974, while earnings of the cohort members are measured in 1992 and 1999. The same data sources have been used previously in studies of families by Björklund et al. (2002), Bratberg et al. (2005), Raaum et al. (2003) and Raaum et al. (2005).

Sweden The Swedish data stem from Statistics Sweden's administrative registers. We use a 20 percent random sample of the cohort born in 1962. The sample is drawn from those born in Sweden and those who were born abroad but moved to Sweden before the age of 17 years. The parent-offspring relationship is that defined by Statistics Sweden in the 1975 Census household. Thus, we use a social definition of fatherhood. We measure this father's earnings in 1970, 1975 and 1980 and offspring's earnings in 1996 and 1999. We include only a single cohort of children, those born in 1962. They were 13 at the time we measure their father's earnings and 34 and 37 years old in 1996 and 2000. Statistics Sweden's earnings originally stem from tax assessment report by individuals and from employers' compulsory reports to tax authorities. Note though that earnings include self-employment income as well as short-term sickness benefits.

United Kingdom The National Child Development Survey (NCDS) began as a survey of all children born in the U.K. in a particular week - March 3rd to March 9th - in 1958. Subsequent follow-up surveys have been conducted in 1965, 1969, 1974, 1981, 1991 and 1999/2000. The NCDS is recognised as a very rich data set that forms the basis for much of the leading work on the empirical analysis of intergenerational mobility in the U.K. (see, for example, Dearden et al. (1997), Gregg & Machin (1999), Gregg & Machin (2000) and Blanden et al. (2004).

The third sweep of the NCDS, NCDS3 in 1974, provides information on weekly net pay of each parent and on all other sources of weekly net income when the child (that is, the cohort member) was aged 16 years. This forms the basis of our measure of parental earnings. We note that the underlying earnings variables are grouped into 12 earnings bands. The value implemented is slightly off the interval midpoint, based on actual distributions from the GHS (General Household Survey). The earnings of offspring are based on information on current gross weekly earnings both from NCDS5 in 1991, when offspring were aged 33 years, and from NCDS6 in 1999/2000, when offspring were aged 41 years. Dearden et al. (1997) have compared the data on parental earnings in NCDS3 with data from the Family Expenditure Survey of 1974. They find the estimated age-earnings profiles to be very similar and conclude that the NCDS3 data on parental earnings are reliable. We note that the average age of fathers in 1974 was 46. Thus, although information on father's income is obtained when they are a little older than offspring at the last date for which we have information on offspring earnings, the difference in age is not great. In our empirical analysis we include controls for father's age. Information on father's age comes from the original 1958 survey and so we restrict the analysis to natural fathers in 1974.

United States (NLSY) The National Longitudinal Survey of Youth is a nationally representative sample of 12,686 young men and women who were 14-22 years old when they were first surveyed in 1979. These individuals are now in their early forties, and have been interviewed annually through 1994 and biennially since 1996. Since their first interview, many of the respondents have made transitions from school to work, and from their parents' homes to being parents and homeowners. These data form the basis for a number of influential studies of the labour market outcomes of American men and women born in the 1950s and 1960s. For youths living at home with their father at the time of the initial survey, we use information about family income as our measure of parental earnings. The family income variable pertains to income earned during 1978, and includes any income from a number of potential sources such as wages, self-employment earnings, disability benefits, and social security. The sample is restricted to those born in the United States and whose father was aged 35 to 64 in 1978. Taking advantage of the sibling structure of the data, we are able to increase the sample size by observing parental income of younger siblings still living with their parents in 1979. In sensitivity analysis, we also use family income in 1979. This information is collected from youths living with their father in 1980, and the sample is extended, whenever possible, to include older siblings who have moved away from the family home. We base the analysis of offspring's labour market status on data collected in 1996 and 2002. Earnings are measured as the respondent's total wage and salary income during the calendar year prior to the survey, that is, earnings are from 1995 and 2001. Included in the sample are only those with a valid earnings record for at least one of those years.

B Appendix tables

Table 12 Intergenerational mobility tables – earnings quintile group transition matrices corrected for age for fathers and sons. Excluding zeros

Denmark (n = 59213)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.247	0.226	0.194	0.189	0.144
	[0.240,0.255]	[0.219,0.233]	[0.186,0.201]	[0.183,0.196]	[0.138,0.150]
fq2	0.208	0.249	0.220	0.188	0.135
	[0.200,0.215]	[0.242,0.256]	[0.213,0.227]	[0.181,0.194]	[0.129,0.141]
fq3	0.188	0.211	0.224	0.207	0.171
	[0.181,0.194]	[0.204,0.218]	[0.216,0.230]	[0.201,0.214]	[0.164,0.177]
fq4	0.165	0.178	0.204	0.223	0.230
	[0.158,0.171]	[0.171,0.185]	[0.197,0.210]	[0.217,0.231]	[0.223,0.237]
fq5	0.153	0.118	0.156	0.209	0.363
	[0.147,0.160]	[0.112,0.124]	[0.150,0.163]	[0.202,0.216]	[0.355,0.371]

Finland (n = 5458)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.278	0.234	0.203	0.172	0.113
	[0.252,0.302]	[0.209,0.259]	[0.180,0.226]	[0.150,0.194]	[0.094,0.134]
fq2	0.192	0.216	0.249	0.191	0.153
	[0.166,0.216]	[0.194,0.240]	[0.225,0.273]	[0.168,0.214]	[0.133,0.173]
fq3	0.177	0.198	0.219	0.216	0.189
	[0.155,0.201]	[0.174,0.224]	[0.196,0.243]	[0.194,0.240]	[0.165,0.213]
fq4	0.164	0.195	0.195	0.229	0.218
	[0.141,0.186]	[0.169,0.222]	[0.171,0.219]	[0.204,0.255]	[0.194,0.243]
fq5	0.151	0.156	0.140	0.206	0.347
	[0.129,0.173]	[0.137,0.179]	[0.117,0.162]	[0.181,0.229]	[0.321,0.375]

Norway (n = 26656)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.282	0.234	0.205	0.159	0.119
	[0.272,0.292]	[0.224,0.244]	[0.195,0.215]	[0.151,0.169]	[0.111,0.127]
fq2	0.202	0.238	0.223	0.200	0.137
	[0.191,0.212]	[0.228,0.248]	[0.212,0.233]	[0.190,0.209]	[0.129,0.147]
fq3	0.188	0.209	0.215	0.210	0.177
	[0.178,0.198]	[0.199,0.219]	[0.204,0.226]	[0.200,0.220]	[0.168,0.187]
fq4	0.173	0.183	0.204	0.221	0.218
	[0.163,0.183]	[0.173,0.193]	[0.194,0.214]	[0.211,0.231]	[0.209,0.229]
fq5	0.146	0.135	0.155	0.209	0.354
	[0.137,0.155]	[0.126,0.144]	[0.145,0.164]	[0.200,0.219]	[0.343,0.366]

Sweden (n = 31996)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.258	0.243	0.215	0.176	0.109
	[0.248,0.267]	[0.233,0.253]	[0.205,0.224]	[0.167,0.184]	[0.102,0.116]
fq2	0.209	0.225	0.237	0.195	0.133
	[0.201,0.218]	[0.216,0.235]	[0.228,0.246]	[0.185,0.204]	[0.125,0.141]
fq3	0.183	0.211	0.219	0.223	0.164
	[0.174,0.192]	[0.201,0.220]	[0.210,0.229]	[0.214,0.232]	[0.155,0.173]
fq4	0.175	0.177	0.196	0.218	0.234
	[0.166,0.184]	[0.168,0.186]	[0.187,0.205]	[0.208,0.227]	[0.224,0.244]
fq5	0.163	0.140	0.134	0.193	0.371
	[0.155,0.171]	[0.131,0.148]	[0.126,0.142]	[0.184,0.202]	[0.361,0.381]

UK (n = 2205)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.303	0.235	0.165	0.174	0.122
	[0.264,0.342]	[0.199,0.272]	[0.133,0.199]	[0.139,0.212]	[0.093,0.151]
fq2	0.241	0.227	0.182	0.193	0.157
	[0.205,0.277]	[0.188,0.266]	[0.145,0.218]	[0.159,0.228]	[0.124,0.191]
fq3	0.188	0.195	0.227	0.206	0.184
	[0.155,0.224]	[0.156,0.235]	[0.188,0.263]	[0.170,0.244]	[0.147,0.221]
fq4	0.161	0.175	0.229	0.195	0.240
	[0.128,0.196]	[0.139,0.209]	[0.194,0.264]	[0.155,0.233]	[0.203,0.278]
fq5	0.107	0.168	0.197	0.231	0.297
	[0.081,0.133]	[0.135,0.199]	[0.162,0.232]	[0.195,0.271]	[0.258,0.335]

USNLSY (n = 1798)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.422	0.245	0.153	0.102	0.079
	[0.363,0.482]	[0.189,0.302]	[0.107,0.202]	[0.065,0.142]	[0.047,0.116]
fq2	0.194	0.283	0.208	0.174	0.140
	[0.142,0.250]	[0.230,0.341]	[0.159,0.260]	[0.128,0.221]	[0.097,0.185]
fq3	0.194	0.186	0.256	0.202	0.162
	[0.145,0.247]	[0.131,0.241]	[0.198,0.318]	[0.148,0.259]	[0.111,0.216]
fq4	0.125	0.182	0.198	0.252	0.243
	[0.082,0.176]	[0.129,0.247]	[0.133,0.263]	[0.198,0.311]	[0.187,0.300]
fq5	0.095	0.122	0.189	0.234	0.360
	[0.057,0.137]	[0.076,0.170]	[0.135,0.243]	[0.176,0.294]	[0.296,0.421]

Note: These results include only those father-offspring pairs that have non-zero earnings. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval.

Table 13 Intergenerational mobility tables – earnings quintile group transition matrices corrected for age for fathers and daughters. Excluding zeros

Denmark (n = 55178)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.235	0.213	0.206	0.185	0.160
	[0.228,0.243]	[0.206,0.220]	[0.199,0.213]	[0.179,0.192]	[0.153,0.166]
fq2	0.215	0.232	0.225	0.189	0.139
	[0.208,0.223]	[0.224,0.239]	[0.217,0.233]	[0.182,0.197]	[0.132,0.145]
fq3	0.188	0.204	0.216	0.208	0.184
	[0.180,0.195]	[0.197,0.212]	[0.209,0.224]	[0.201,0.216]	[0.177,0.190]
fq4	0.178	0.184	0.196	0.216	0.227
	[0.172,0.185]	[0.176,0.190]	[0.188,0.203]	[0.208,0.223]	[0.220,0.234]
fq5	0.172	0.148	0.150	0.211	0.320
	[0.165,0.179]	[0.141,0.154]	[0.144,0.157]	[0.203,0.217]	[0.312,0.327]

Finland (n = 5144)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.238	0.201	0.230	0.195	0.136
	[0.213,0.263]	[0.175,0.226]	[0.205,0.256]	[0.171,0.221]	[0.114,0.157]
fq2	0.222	0.225	0.202	0.191	0.159
	[0.197,0.249]	[0.201,0.254]	[0.178,0.229]	[0.166,0.216]	[0.138,0.184]
fq3	0.187	0.190	0.203	0.225	0.195
	[0.164,0.210]	[0.164,0.218]	[0.178,0.229]	[0.200,0.251]	[0.170,0.220]
fq4	0.181	0.206	0.196	0.206	0.210
	[0.157,0.204]	[0.182,0.232]	[0.170,0.224]	[0.179,0.231]	[0.185,0.236]
fq5	0.172	0.166	0.160	0.188	0.313
	[0.148,0.196]	[0.142,0.190]	[0.137,0.184]	[0.164,0.213]	[0.286,0.339]

Norway (n = 25046)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.235	0.214	0.209	0.199	0.143
	[0.224,0.246]	[0.203,0.225]	[0.198,0.220]	[0.189,0.209]	[0.134,0.153]
fq2	0.212	0.225	0.223	0.196	0.145
	[0.200,0.222]	[0.213,0.237]	[0.211,0.233]	[0.186,0.207]	[0.135,0.155]
fq3	0.191	0.206	0.211	0.203	0.189
	[0.181,0.202]	[0.195,0.216]	[0.201,0.223]	[0.191,0.213]	[0.178,0.199]
fq4	0.188	0.192	0.199	0.208	0.212
	[0.178,0.198]	[0.181,0.202]	[0.189,0.210]	[0.197,0.219]	[0.202,0.223]
fq5	0.171	0.159	0.161	0.195	0.313
	[0.161,0.181]	[0.149,0.169]	[0.151,0.171]	[0.185,0.206]	[0.302,0.324]

Sweden (n = 30410)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.239	0.214	0.215	0.187	0.145
	[0.229,0.248]	[0.205,0.224]	[0.205,0.224]	[0.178,0.196]	[0.137,0.153]
fq2	0.208	0.213	0.224	0.209	0.146
	[0.199,0.217]	[0.204,0.223]	[0.215,0.233]	[0.200,0.219]	[0.137,0.155]
fq3	0.197	0.202	0.212	0.213	0.177
	[0.188,0.207]	[0.192,0.211]	[0.202,0.221]	[0.203,0.223]	[0.167,0.186]
fq4	0.181	0.194	0.200	0.204	0.221
	[0.172,0.190]	[0.184,0.203]	[0.190,0.210]	[0.195,0.214]	[0.211,0.231]
fq5	0.165	0.172	0.150	0.190	0.323
	[0.156,0.173]	[0.163,0.180]	[0.142,0.158]	[0.181,0.199]	[0.313,0.333]

UK (n = 2348)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.232	0.226	0.198	0.183	0.162
	[0.193,0.266]	[0.190,0.262]	[0.163,0.235]	[0.149,0.219]	[0.129,0.195]
fq2	0.211	0.249	0.185	0.181	0.174
	[0.179,0.246]	[0.212,0.284]	[0.151,0.220]	[0.150,0.213]	[0.140,0.211]
fq3	0.224	0.164	0.232	0.192	0.188
	[0.190,0.260]	[0.126,0.203]	[0.198,0.265]	[0.156,0.228]	[0.154,0.222]
fq4	0.200	0.209	0.194	0.226	0.172
	[0.170,0.233]	[0.174,0.243]	[0.157,0.227]	[0.193,0.261]	[0.139,0.204]
fq5	0.134	0.154	0.190	0.220	0.303
	[0.105,0.165]	[0.118,0.190]	[0.156,0.223]	[0.183,0.255]	[0.265,0.341]

USNLSY (n = 1607)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.256	0.232	0.252	0.163	0.097
	[0.204,0.312]	[0.169,0.296]	[0.195,0.313]	[0.114,0.218]	[0.066,0.137]
fq2	0.197	0.241	0.195	0.206	0.161
	[0.139,0.261]	[0.182,0.303]	[0.139,0.256]	[0.151,0.261]	[0.109,0.214]
fq3	0.202	0.257	0.206	0.166	0.169
	[0.143,0.268]	[0.193,0.319]	[0.141,0.273]	[0.106,0.223]	[0.115,0.227]
fq4	0.171	0.178	0.185	0.233	0.233
	[0.114,0.237]	[0.120,0.238]	[0.132,0.245]	[0.170,0.296]	[0.172,0.297]
fq5	0.180	0.114	0.143	0.225	0.338
	[0.123,0.238]	[0.071,0.168]	[0.081,0.210]	[0.163,0.295]	[0.273,0.413]

Note: These results include only those father-offspring pairs that have non-zero earnings. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval.

Table 14 Intergenerational mobility tables – earnings quintile group transition matrices corrected for age for fathers and sons. Including zeros

Denmark (n = 87193)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.253	0.205	0.195	0.181	0.167
	[0.246,0.260]	[0.198,0.212]	[0.188,0.202]	[0.174,0.187]	[0.161,0.173]
fq2	0.237	0.236	0.196	0.185	0.145
	[0.230,0.244]	[0.229,0.243]	[0.189,0.203]	[0.179,0.192]	[0.139,0.151]
fq3	0.179	0.238	0.235	0.203	0.145
	[0.172,0.186]	[0.232,0.246]	[0.228,0.242]	[0.196,0.210]	[0.138,0.151]
fq4	0.165	0.195	0.217	0.220	0.203
	[0.159,0.172]	[0.188,0.201]	[0.211,0.224]	[0.214,0.227]	[0.195,0.210]
fq5	0.161	0.133	0.157	0.212	0.337
	[0.154,0.167]	[0.128,0.139]	[0.151,0.163]	[0.205,0.219]	[0.329,0.344]

Finland (n = 6108)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.281	0.226	0.210	0.154	0.128
	[0.255,0.304]	[0.205,0.248]	[0.187,0.233]	[0.133,0.175]	[0.111,0.149]
fq2	0.214	0.216	0.233	0.194	0.144
	[0.191,0.237]	[0.194,0.238]	[0.209,0.255]	[0.170,0.219]	[0.124,0.164]
fq3	0.184	0.207	0.215	0.224	0.171
	[0.161,0.206]	[0.183,0.229]	[0.191,0.241]	[0.199,0.249]	[0.148,0.194]
fq4	0.166	0.197	0.193	0.220	0.225
	[0.144,0.187]	[0.173,0.221]	[0.168,0.217]	[0.197,0.245]	[0.201,0.249]
fq5	0.153	0.154	0.147	0.210	0.336
	[0.130,0.175]	[0.134,0.172]	[0.126,0.167]	[0.187,0.232]	[0.310,0.362]

Norway (n = 28014)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.284	0.234	0.200	0.161	0.119
	[0.275,0.294]	[0.225,0.245]	[0.190,0.210]	[0.152,0.171]	[0.111,0.127]
fq2	0.206	0.240	0.220	0.199	0.135
	[0.196,0.216]	[0.230,0.250]	[0.209,0.230]	[0.190,0.209]	[0.126,0.144]
fq3	0.184	0.210	0.218	0.213	0.174
	[0.174,0.193]	[0.200,0.221]	[0.208,0.229]	[0.203,0.223]	[0.165,0.185]
fq4	0.176	0.181	0.203	0.220	0.221
	[0.166,0.186]	[0.172,0.190]	[0.192,0.213]	[0.210,0.230]	[0.211,0.231]
fq5	0.150	0.134	0.158	0.207	0.350
	[0.141,0.159]	[0.125,0.142]	[0.149,0.168]	[0.197,0.217]	[0.339,0.362]

Sweden (n = 33959)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.267	0.238	0.210	0.173	0.111
	[0.258,0.276]	[0.229,0.248]	[0.201,0.218]	[0.165,0.182]	[0.104,0.119]
fq2	0.208	0.230	0.233	0.195	0.134
	[0.199,0.216]	[0.221,0.240]	[0.223,0.242]	[0.186,0.204]	[0.126,0.142]
fq3	0.184	0.209	0.224	0.222	0.162
	[0.174,0.193]	[0.200,0.218]	[0.214,0.233]	[0.213,0.231]	[0.154,0.171]
fq4	0.176	0.178	0.198	0.219	0.230
	[0.167,0.185]	[0.169,0.187]	[0.189,0.206]	[0.209,0.228]	[0.220,0.239]
fq5	0.163	0.142	0.136	0.192	0.367
	[0.156,0.172]	[0.134,0.150]	[0.128,0.144]	[0.183,0.200]	[0.357,0.377]

UK (n = 2205)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.303	0.235	0.165	0.174	0.122
	[0.264,0.342]	[0.199,0.272]	[0.133,0.199]	[0.139,0.212]	[0.093,0.151]
fq2	0.241	0.227	0.182	0.193	0.157
	[0.205,0.277]	[0.188,0.266]	[0.145,0.218]	[0.159,0.228]	[0.124,0.191]
fq3	0.188	0.195	0.227	0.206	0.184
	[0.155,0.224]	[0.156,0.235]	[0.188,0.263]	[0.170,0.244]	[0.147,0.221]
fq4	0.161	0.175	0.229	0.195	0.240
	[0.128,0.196]	[0.139,0.209]	[0.194,0.264]	[0.155,0.233]	[0.203,0.278]
fq5	0.107	0.168	0.197	0.231	0.297
	[0.081,0.133]	[0.135,0.199]	[0.162,0.232]	[0.195,0.271]	[0.258,0.335]

USNLSY (n = 1930)

Father	Son oq1	oq2	oq3	oq4	oq5
fq1	0.400	0.254	0.165	0.108	0.074
	[0.348,0.451]	[0.206,0.307]	[0.121,0.209]	[0.074,0.148]	[0.042,0.109]
fq2	0.205	0.262	0.208	0.186	0.139
	[0.155,0.260]	[0.206,0.320]	[0.156,0.265]	[0.139,0.233]	[0.094,0.183]
fq3	0.181	0.204	0.250	0.202	0.162
	[0.132,0.234]	[0.147,0.262]	[0.192,0.312]	[0.149,0.266]	[0.111,0.214]
fq4	0.138	0.164	0.206	0.238	0.255
	[0.094,0.185]	[0.117,0.217]	[0.153,0.264]	[0.184,0.294]	[0.198,0.313]
fq5	0.098	0.117	0.166	0.259	0.360
	[0.060,0.141]	[0.074,0.166]	[0.113,0.220]	[0.199,0.316]	[0.298,0.421]

Note: These results include all father-offspring pairs, i.e., even those with zero earnings. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval.

Table 15 Intergenerational mobility tables – earnings quintile group transition matrices corrected for age for fathers and daughters. Including zeros

Denmark (n = 80637)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.213	0.208	0.204	0.192	0.182
	[0.206,0.221]	[0.201,0.216]	[0.197,0.211]	[0.185,0.199]	[0.176,0.188]
fq2	0.235	0.216	0.206	0.182	0.161
	[0.228,0.242]	[0.209,0.224]	[0.199,0.214]	[0.175,0.190]	[0.155,0.167]
fq3	0.203	0.223	0.229	0.197	0.148
	[0.196,0.210]	[0.216,0.230]	[0.222,0.237]	[0.190,0.204]	[0.142,0.155]
fq4	0.177	0.195	0.206	0.215	0.207
	[0.171,0.185]	[0.188,0.202]	[0.198,0.213]	[0.208,0.222]	[0.200,0.214]
fq5	0.177	0.159	0.155	0.211	0.298
	[0.171,0.184]	[0.153,0.165]	[0.148,0.161]	[0.204,0.218]	[0.291,0.305]

Finland (n = 5749)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.255	0.186	0.229	0.182	0.148
	[0.231,0.280]	[0.161,0.211]	[0.203,0.253]	[0.160,0.207]	[0.127,0.169]
fq2	0.206	0.246	0.192	0.201	0.156
	[0.183,0.229]	[0.221,0.271]	[0.167,0.218]	[0.176,0.225]	[0.135,0.179]
fq3	0.182	0.205	0.217	0.222	0.174
	[0.159,0.207]	[0.177,0.233]	[0.190,0.241]	[0.197,0.248]	[0.150,0.198]
fq4	0.188	0.190	0.200	0.198	0.223
	[0.164,0.213]	[0.165,0.215]	[0.178,0.223]	[0.174,0.223]	[0.200,0.248]
fq5	0.167	0.172	0.165	0.195	0.301
	[0.144,0.191]	[0.151,0.193]	[0.142,0.187]	[0.170,0.218]	[0.275,0.326]

Norway (n = 26838)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.243	0.207	0.203	0.200	0.147
	[0.233,0.254]	[0.196,0.217]	[0.193,0.214]	[0.190,0.210]	[0.137,0.156]
fq2	0.211	0.231	0.221	0.193	0.143
	[0.201,0.221]	[0.221,0.241]	[0.211,0.231]	[0.183,0.204]	[0.134,0.153]
fq3	0.196	0.204	0.212	0.201	0.186
	[0.187,0.206]	[0.193,0.215]	[0.202,0.222]	[0.190,0.211]	[0.176,0.196]
fq4	0.181	0.190	0.202	0.215	0.212
	[0.171,0.191]	[0.180,0.200]	[0.191,0.212]	[0.204,0.225]	[0.203,0.222]
fq5	0.168	0.167	0.162	0.191	0.311
	[0.158,0.177]	[0.158,0.177]	[0.152,0.172]	[0.182,0.202]	[0.299,0.322]

Sweden (n = 32209)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.244	0.214	0.210	0.186	0.145
	[0.235,0.254]	[0.206,0.223]	[0.200,0.221]	[0.178,0.196]	[0.137,0.153]
fq2	0.213	0.214	0.220	0.207	0.146
	[0.204,0.223]	[0.205,0.224]	[0.210,0.230]	[0.198,0.216]	[0.137,0.154]
fq3	0.195	0.203	0.210	0.216	0.175
	[0.186,0.205]	[0.194,0.213]	[0.201,0.219]	[0.206,0.225]	[0.166,0.184]
fq4	0.180	0.195	0.203	0.204	0.218
	[0.170,0.189]	[0.186,0.205]	[0.193,0.213]	[0.195,0.213]	[0.208,0.228]
fq5	0.166	0.171	0.154	0.189	0.320
	[0.157,0.174]	[0.163,0.180]	[0.145,0.162]	[0.181,0.199]	[0.310,0.330]

UK (n = 2348)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.232	0.226	0.198	0.183	0.162
	[0.193,0.266]	[0.190,0.262]	[0.163,0.235]	[0.149,0.219]	[0.129,0.195]
fq2	0.211	0.249	0.185	0.181	0.174
	[0.179,0.246]	[0.212,0.284]	[0.151,0.220]	[0.150,0.213]	[0.140,0.211]
fq3	0.224	0.164	0.232	0.192	0.188
	[0.190,0.260]	[0.126,0.203]	[0.198,0.265]	[0.156,0.228]	[0.154,0.222]
fq4	0.200	0.209	0.194	0.226	0.172
	[0.170,0.233]	[0.174,0.243]	[0.157,0.227]	[0.193,0.261]	[0.139,0.204]
fq5	0.134	0.154	0.190	0.220	0.303
	[0.105,0.165]	[0.118,0.190]	[0.156,0.223]	[0.183,0.255]	[0.265,0.341]

USNLSY (n = 1834)

Father	Daughter oq1	oq2	oq3	oq4	oq5
fq1	0.258	0.213	0.251	0.184	0.094
	[0.206,0.313]	[0.159,0.268]	[0.193,0.307]	[0.136,0.235]	[0.064,0.133]
fq2	0.169	0.223	0.228	0.209	0.170
	[0.114,0.222]	[0.163,0.283]	[0.171,0.286]	[0.157,0.261]	[0.120,0.226]
fq3	0.167	0.259	0.233	0.162	0.178
	[0.116,0.224]	[0.196,0.330]	[0.175,0.299]	[0.106,0.217]	[0.126,0.233]
fq4	0.188	0.184	0.170	0.219	0.240
	[0.133,0.253]	[0.129,0.243]	[0.111,0.231]	[0.163,0.274]	[0.181,0.300]
fq5	0.220	0.122	0.125	0.220	0.313
	[0.168,0.274]	[0.078,0.172]	[0.075,0.178]	[0.165,0.277]	[0.250,0.383]

Note: Tese results include all father-offspring pairs, i.e., even those with zero earnings. The numbers in brackets below the point estimates show the bias corrected 95 percent bootstrap confidence interval.

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