Two Nations?

The Inheritance of Poverty and Affluence

Paul Johnson and Howard Reed

Institute for Fiscal Studies

An E.S.R.C. Research Centre

The Institute for Fiscal Studies
7 Ridgmount Street
London WC1E 7AE

Tel.: +44-171-636 3784
Fax: +44-171-323 4780
Email: mailbox@ifs.org.uk

Published by

The Institute for Fiscal Studies
7 Ridgmount Street
London WC1E 7AE
Tel.: +44-171-636 3784
Fax: +44-171-323 4780

ISBN 1-873357-53-2

Printed by

KKS Printing
Stanway Street
London N1 6RZ

Acknowledgement

The authors gratefully acknowledge the financial support of the Economic and Social Research Council through core funding of the ESRC Centre for Fiscal Policy at IFS.

This paper will be published in *Oxford Review of Economic Policy*, volume 12, number 1.

Contents

Introduction

Does inequality in the distribution of income matter? All sorts of answers can be provided to that question. Some have argued that a large degree of inequality, howsoever it comes about, is a matter of social, or indeed ethical, concern. Others would argue that it is the routes through which inequality is created that matter. If the industrious and talented have much higher incomes than the work-shy and stupid, then not only might we not be worried about inequality between them, but also such inequality as there is might be considered a positive good. If, on the other hand, inequality arises from chance of birth — if one's income is virtually determined by that of one's parents — then an unequal distribution might be a cause of serious concern. It might also be a cause for government action. This article is concerned with the intergenerational transmission of incomes.

If we take an income distribution defined over a cohort of parents and a corresponding distribution defined over their children, the question that an analysis of intergenerational income mobility is designed to answer is 'to what extent is there a correlation between a parent's position in the income distribution and that of his or her child?'. Is the affluence of our parents largely irrelevant in determining our eventual position in society, or does somebody stand a much better chance of doing well in later life if he or she comes from a well-off family? Correspondingly, are successive generations of disadvantaged families trapped in cycles of poverty? Obviously, providing rigorous answers to these questions is essential if we wish to ascertain whether intergenerational immobility represents a social problem, and if so, what can be done about it.

If we do find immobility, it is necessary to confront the even more difficult question of what is causing the transmission of outcomes across generations. Do poor children lack the opportunities for education and social advancement afforded the rest of society, or are they in some way less able than the rich, regardless of access to opportunities? In this Commentary, we hope to measure the extent of (im)mobility in Britain, and to attempt to find at least some of its causes.

We extend previous work on mobility by using a novel dataset, the National Child Development Survey, to look in particular at movements to and from the top and bottom of the distribution. These are parts of the distribution that might be of particular concern if we

are worried either about people being trapped in poverty and welfare dependency, or about transmission of power and influence within families.

We begin with a brief survey of the issues involved in the measurement of mobility and provide a few examples of previous empirical research. In the main part of the paper, we go on to present new evidence of the degree of mobility to and from the top and bottom of the distribution.

Measuring Mobility

One way to model the extent of mobility is through a simple log-linear regression of child's on parent's income:

$$y_i^{child} = \alpha + \beta y_i^{parent} + \varepsilon_i \qquad (1)$$

where y_i^{child} is log of child's income, y_i^{parent} is log of parent's income and ε_i is a random error term. The extent of intergenerational immobility, or transmission, is measured by β, the coefficient on parent's income. The two extreme cases in this model are *complete mobility*, where $\beta = 0$ and parental income is irrelevant to determining the child's income distribution, and *complete immobility*, where $\beta = 1$ and each child's place in the younger generation's income distribution is completely determined by parental income. Intermediate values imply intermediate degrees of mobility, so that a coefficient of 0.5 would indicate that the income of an individual in the current generation is half determined by their parent's income and half by other things. The coefficient can also be interpreted like an elasticity — one could expect a 1 per cent increase in parental income to result in a ½ per cent increase in child's income.

It should be stressed that it is *lifetime* or '*permanent*' income in which we are interested rather than current income as measured at any point in time; this could be taken as corresponding to the measure of income as used in life-cycle theories of consumption, but it is sometimes interpreted more broadly as encompassing everything that contributes to a person's economic and social status throughout his or her life. The problem for most attempts to estimate intergenerational mobility is that we only observe incomes of parents and children either once or on a very limited number of occasions. The worst manifestation of this problem lies in the fact that the parents of any given generation of children will vary in age when the children are born, so if, as is usual, we observe their incomes at a particular date, a

significant part of the income differences might result from the different points in the life cycle at which they are interviewed. The fact that the income of a 20-year-old is considerably less than that of a 40-year-old might tell us nothing about their relative positions over their lifetimes.

Such issues are discussed again in the next section, which deals with previous empirical work and the problems faced.

Previous Empirical Work and Problems

Table 1 presents some results from previous empirical work using the regression approach. The early US studies documented in the survey article by Becker and Tomes (1986) produced estimates of β at around 0.2, which led to the consensus opinion that immobility was not a particular cause for concern. This conclusion was disputed, however, by more recent American work (see in particular Solon (1992) and Zimmerman (1992)). In Britain, the main estimates using this kind of methodology are by Atkinson (1981) and Atkinson, Maynard and Trinder (1983). The charge levelled in these papers was that simple Ordinary Least Squares regression of fathers' on sons' current income, as used in the early work, generated biased results of β for the following reasons:

- problems caused by observing parents and children at different points in their life cycle, which can bias the estimate of β even when age effects are removed;
- the fact that many of the datasets used by early researchers were from samples that were much more homogeneous than the overall population (e.g. the sample of white male twins used by Behrman and Taubman (1985)).

This theoretical work on biases (which for the most part were alleged to bias β downward) led to the adoption of more sophisticated econometric techniques in an attempt to correct for bias; some of these are described in Table 1. The correction technique that interests us in this paper is used by Dearden, Machin and Reed (1995); it basically involves using information on the observable components of permanent status (e.g. educational attainment, social class variables) in conjunction with observed income to predict overall permanent status

conditional on what we observe.[1] Overall, the use of more complicated estimation methods produces much increased estimates of β — at least 0.4, and sometimes 0.5 or higher. If the new estimates are accurate, then immobility is a non-trivial phenomenon both in the UK and in the US.

Table 1: Recent regression estimates of intergenerational mobility

Author	Data	Estimation method	Estimate of β
Becker and Tomes, 1986	'Consensus' estimates from early (mainly US) studies	Usually OLS on single cross-section	Approx. .200
Atkinson, 1981	UK data on 307 father–son pairs with sons subsequently traced (in the late 1970s) from 1950 York Rowntree survey	OLS, raw wage	.358
		OLS, life-cycle adjustment	.425
Solon, 1992	US data from the Panel Survey of Income Dynamics on about 300 father–son pairs	OLS, corrected estimates of permanent status	.386
		IV (instrument = father's years of education)	.526
Zimmerman, 1992	US data from the National Longitudinal Survey on 876 father–son pairs	OLS, raw wage	.248
		IV (instrument = father's Duncan index of socio-economic status)	.417
Dearden, Machin and Reed, 1995	UK data from the National Child Development Survey; 1,565 father–son pairs, father's income measured 1974, son's income 1991	OLS, raw wage	.240
		IV (instrument = father's years of education)	.581
		OLS, corrected estimates of permanent status	.441

Data

Another problem with the early studies was the poor quality of data available. Ideally for this work, we would require observations on two generations over both life cycles; no such dataset exists at present. Early work often used contemporaneous interviewing of fathers and

[1] For a more technical explanation of this technique and the other techniques used to correct for bias, see Dearden, Machin and Reed (1995), and for the other techniques, Solon (1989 and 1992) and Zimmerman (1992).

sons, retrospective data on fathers' earnings from a sample of sons, or tracing the sons from an earlier survey of parents. All these approaches are problematic due to life-cycle problems, unrepresentative sampling and/or inaccurate reporting.[2] Recent US work uses earnings data from panel surveys which are of a much higher quality.

We use data from the UK National Child Development Survey (a cohort study of all individuals born in one week in 1958). Our data on children's earnings, etc. are taken from NCDS wave 5 in 1991 when the cohort of children was 33 years old, and the parents' data mainly from NCDS3 in 1974. We also use some data from NCDS1 (1965) and NCDS2 (1969). These data provide detailed information on, among much else, the incomes, educational attainments and occupations of both parents and children. The NCDS data provide one of the best available sources of information for studies of this kind.

A Different Perspective: The Transition Matrix Approach

Another way of trying to measure mobility is through a quantile transition matrix. The basic idea is simple yet powerful. Divide the income distributions for parents and children (preferably corrected for permanent status) into N equally-sized quantiles (quartiles are a commonly-used division). Then construct an $N \times N$ matrix showing the proportions of sons of fathers from each quantile in the father's distribution making a transition into each quantile in the son's distribution. For a father's quantile i and a son's quantile j, the proportion is denoted by a_{ij}. . Table 2a shows an example of a quartile transition matrix using data from Dearden, Machin and Reed (1995), whilst Tables 2b and 2c show what the extreme situations of complete immobility and complete mobility look like in this framework.

One important feature of these matrices is that all the rows and columns sum to one, i.e. the matrix is *bi-stochastic*. This property arises from the fact that both the father's and son's distributions are equally sized and divided into equal groups.

[2] For a more detailed discussion of the data problems in early surveys, see Atkinson (1981).

Table 2: Transition matrices

a: Data from Dearden, Machin and Reed (1995)

		Son's quartile			
		Bottom	**2nd**	**3rd**	**Top**
Father's quartile	**Bottom**	**.338**	.297	.238	.128
	2nd	.294	**.312**	.253	.140
	3rd	.304	.243	**.243**	.209
	Top	.064	.148	.266	**.522**

b: Complete immobility

		Son's quartile			
		Bottom	**2nd**	**3rd**	**Top**
Father's quartile	**Bottom**	**1**	0	0	0
	2nd	0	**1**	0	0
	3rd	0	0	**1**	0
	Top	0	0	0	**1**

c: Complete mobility

		Son's quartile			
		Bottom	**2nd**	**3rd**	**Top**
Father's quartile	**Bottom**	**.25**	.25	.25	.25
	2nd	.25	**.25**	.25	.25
	3rd	.25	.25	**.25**	.25
	Top	.25	.25	.25	**.25**

We see that in the case of complete immobility, everyone stays on the leading diagonal of the matrix, and in the case of complete mobility, the distribution is completely uniform. Transition matrices on actual data will fall somewhere between the two extremes. From the data analysed by Dearden et al., we see from looking at the leading diagonal that the biggest proportion of sons who remain in the same quartile as their fathers is in the highest-earning (top) quartile — 52 per cent, a markedly large figure. The proportion of sons remaining in the lowest earning quartile is also relatively large. There does, however, appear to be some asymmetry, with upward movement from the bottom of the distribution being easier than downward movement from the top. In part, though, this result illustrates a problem with using

earnings data — the sample illustrated in the matrix is drawn from those fathers and sons who both had earnings, so the unemployed are excluded. One can move downwards out of the bottom quartile of earnings into unemployment. One cannot move upwards from the top quartile. This problem is a part of the motivation for the main analysis of this paper, which looks in detail at the extremes of the distribution.

Extension of Transition Matrices: Social Class

So far we have concentrated on incomes. It is also possible to look at mobility between social classes, again using transition matrices. The classification schema that we use splits employees up into Class I (managerial), Class II (professional), Class III (skilled workers), Class IV (semi-skilled workers) and Class V (unskilled workers); there is also a subdivision of Class III into non-manual and manual workers. One problem with using a discrete variable such as social class as the variable of interest is that the rows and columns of the transition matrix will not be equally sized (as was the case when income quantiles were used). This means that it is a little more complex to infer conclusions from a social class matrix, as we have to be careful not to confuse movements in class from father to child because of intergenerational transmission with movement occurring merely because of the changing structure of employment (e.g. the decline of skilled manual labour). To illustrate, Table 3 gives, to the nearest percentage point, the proportions of fathers and sons and fathers and daughters in various social class groupings, as well as the overall sample size we use. It is clear from these figures that the cell sizes will be quite unequal, sometimes strikingly so (for example, the 44 per cent of fathers in Class III non-manual as opposed to a mere 7 per cent of daughters in that class).

Table 3: Proportions of fathers and sons/daughters in different social classes

	Percentages of sample in indicated social class (%)				
	I/II	**III-m**	**III-nm**	**IV/V**	*Sample size*
Fathers/	27	10	44	19	
Sons:	39	11	35	16	3,573
Fathers/	28	10	44	19	
Daughters:	32	36	7	25	3,591

There are also problems associated with the fact that people move between social classes over time. Young people might well move up as they get older. In addition, the skill requirements, prestige and relative remuneration associated with a job with a certain nominal description may change over time. The upshot of this is that over different generations there can be real problems associated with achieving consistent definitions of class over time.[3]

Because of these problems, we do not show raw transition matrices. We instead present a set of results derived from these data which is more suited to our purposes. The tables below give the ratio of the probability that a child of a father from a particular social class will end up in a given class to the probability that a child of a father from a *different* social class will end up in that given class. Hence it gives us some idea of the 'competition' for entry into a particular class at adulthood, and the effect that family background has on the outcomes of that competition. If family background does not affect class outcomes, then we might expect the ratios in the tables to be very close to one. The results are shown in Tables 4a and 4b.

Table 4a: Likelihood ratios of fathers coming from different social classes at NCDS3, grouped by son's class at NCDS5

[Log ratios in brackets]	*Son's social class at NCDS5*			
Different fathers' social classes at NCDS3	**I/II**	**III-nm**	**III-m**	**IV/V**
I/II vs. III-nm	1.4 [0.34]	0.6 [–0.48]	0.7 [–0.37]	0.8 [–0.27]
I/II vs. III-m	2.1 [0.74]	1.3 [0.24]	0.4 [–0.87]	0.4 [–0.87]
I/II vs. IV/V	2.7 [1.01]	1.8 [0.61]	0.4 [–0.84]	0.3 [–1.34]
III-nm vs. III-m	1.5 [0.41]	2.1 [0.72]	0.6 [–0.49]	0.6 [–0.60]
III-nm vs. IV/V	2.0 [0.68]	3.0 [1.09]	0.6 [–0.47]	0.3 [–1.08]
III-m vs. IV/V	1.3 [0.27]	1.5 [0.37]	1.0 [0.01]	0.6 [–0.48]

[3] The data on father's social class from NCDS3 use the 1971 classification. For sons and daughters, NCDS5 contains social class data organised by a variety of classifications. It was decided to use the 1991 classification for the sons' and daughters' data, although using the 1971 classification does not produce radically different results from those presented here.

Table 4b: Likelihood ratios of fathers coming from different social classes at NCDS3, grouped by daughter's class at NCDS5

[Log ratios in brackets]	*Daughter's social class at NCDS5*			
Different fathers' social classes at NCDS3	**I/II**	**III-nm**	**III-m**	**IV/V**
I/II vs. III-nm	1.4 [0.35]	0.8 [–0.21]	1.1 [0.06]	0.7 [–0.38]
I/II vs. III-m	1.8 [0.59]	1.0 [–0.08]	0.5 [–0.65]	0.5 [–0.78]
I/II vs. IV/V	2.2 [0.81]	1.0 [0.02]	0.4 [–0.85]	0.4 [–0.97]
III-nm vs. III-m	1.3 [0.24]	1.1 [0.13]	0.5 [–0.72]	0.7 [–0.36]
III-nm vs. IV/V	1.6 [0.46]	1.3 [0.24]	0.4 [–0.92]	0.6 [–0.59]
III-m vs. IV/V	1.2 [0.22]	1.1 [0.01]	0.8 [–0.20]	0.8 [–0.23]

As an illustration of what these tables mean, look at the first column, fifth row down, of Table 4a, where the number appearing is 2.0. This means that a son with a father from Class III-nm is twice as likely to end up in Class I/II as is a son with a father from Class IV/V. In this sense, the figures can be considered as the relative odds of sons with fathers from one background as opposed to another ending up in a particular social class. Because they are a comparison of odds among the children all at the same age, the problems associated with changing class composition are largely circumvented. The odds might be different from what they would have been if class compositions had not been changing (though they need not be), but they are telling us about the relative chances of individuals from the same cohort and at the same age reaching a particular status.

As the row categories are always expressed as higher class vs. lower class, an outcome where a higher class background is more likely is expressed by a ratio more than one (positive log ratio), and an outcome where a lower class background is more likely by a ratio less than one (negative log ratio). Also, the more the ratio deviates from one (the log ratio deviates from zero), the more important differences in family background are for determining eventual

social class. In terms of comparing the intensity of differences in likelihood, it is better to use the log ratio, because of its symmetric property: if all the *A* vs. *B* entries in the above tables were reversed to *B* vs. *A*, the raw ratios would alter substantially, whereas the log ratios merely reverse in sign.

The results obtained here illustrate a number of interesting points. First, in the left-hand column, the ratios are all greater than one. This ties in with what we would expect – people starting from a higher class background should find it easier to get into the top class than people with a lower class background. The reverse is true for the right-hand column; here, the ratios are all less than one, and hence people from lower class backgrounds are more likely to 'fall' into the bottom class. Second, the ratios are particularly large, in absolute terms, when we compare non-manual workers (i.e. Classes I/II and III-nm) with manual workers (i.e. Classes III-m and IV/V). In the outside columns (son's Class I/II and IV/V), the absolute value of the log ratios for manual/non-manual comparisons ranges between 0.24 and 1.34, whereas for manual/manual or non-manual/non-manual comparisons it ranges between 0.22 and 0.48. Not only are the offspring of the higher classes more likely to end up in the higher classes than the offspring of the lower classes, and vice versa, but there seems to be a clear division between the mobility prospects of manual and non-manual workers.

Sons from managerial/professional families are getting on for three times as likely to end up in managerial/professional occupations themselves as are sons from semi-skilled and unskilled manual fathers. They are less than a third as likely to end up in this lowest group.

Finally, the magnitudes of the log ratios are in the main somewhat greater on the fathers/sons table than on the fathers/daughters table. This seems to indicate that father's social class is a more important determinant of eventual social standing in the case of sons than of daughters; this may be because a substantial proportion of daughters in NCDS5 are married and not in the labour force, and hence their social class is determined by their husband's social class in a way that destroys the link between the father's social class and the daughter's current situation.

The Top and Bottom of the Distribution

Analysis of transition matrices presents a more detailed picture of the patterns of intergenerational mobility to be found in the NCDS data than does the regression approach. It nevertheless still presents a fairly aggregated picture. We now move beyond this to look in more detail at mobility to and from the top and bottom of the income distribution — areas in which particular interest is often expressed.

If people are trapped in the low incomes of their parents, or if it is only possible for those from families at the very top of the distribution to get to the top themselves, we might be particularly worried about the degree of intergenerational mobility. These are groups for whom life chances might be very different from those of the rest of the population. And these are groups whose exclusion from society in the one instance, and power in the other, make them of interest for a variety of economic, social and political reasons. At the bottom of the distribution, worries about intergenerational transmission of poverty and welfare dependency are of particular concern. Movement, or lack of it, around the intermediate parts of the distribution might be of significantly less concern.

Rather than simply breaking down the population by income level and selecting the poorest quintile or decile, we select poor parents and offspring on the basis of group or type, looking at groups such as single parents and the long-term unemployed. This makes the analysis more interesting as it allows us to consider the reasons for entering a group that we know is poor over a long period. It also gets around the problems associated with measuring the determinants of incomes that are not based on earnings but on social security benefits.[4]

The question we are asking here is 'does one's family background affect the probability of being especially disadvantaged or advantaged in the labour market?'. For example, one can look at the proportion of sons and daughters (as measured by NCDS5) who fall into a generally disadvantaged category, such as the unemployed or lone parents, and examine whether the extent of that disadvantage amongst children of unemployed, low-income or absent fathers as measured by earlier NCDSs is significantly higher than that of the overall sample. In general, there are two sorts of questions one can ask — 'where do the rich/poor

[4] When we look at the top of the distribution, we do use income as the basis for comparison. This is (a) because the problems of incomes being composed mainly of social security benefits are unlikely to apply here and (b) because it is difficult to identify a group that we know is rich over a long period except by looking at income.

come from?' and 'what happens to the offspring of the rich/poor?'. We perform a number of such analyses, on the following groups:

- sons/daughters who were unemployed for one or more of the years 1981–91;
- sons/daughters with no father/mother at NCDS3; and
- daughters who were lone parents at NCDS5 (we also perform work on the subsample of lone mothers who had never been married).

With respect to the fathers/mothers of these subgroups, we were interested in the following:

- the father's unemployment history (starting with a 'snapshot' at NCDS3 and then bringing in additional information from earlier NCDSs);
- the father's raw income quintile;
- the father's estimated 'permanent' income quintile from the father's wage equations discussed earlier; and
- the mother's raw income quintile.

We also do work on those sons/daughters who were in the top quintile/decile of the 1991 income distribution. In addition, for both the advantaged and the disadvantaged, we do some analysis on educational attainment and ability scores in school tests to ascertain whether there is some characteristic of the high or low achievers that sets them apart from the population at large.

Unemployment

We begin by looking at the unemployment status of sons and relating it to the earnings and employment status of their fathers. Table 5 shows the proportion of sons who had been unemployed for a (cumulative) year or more in the decade prior to their thirty-third birthday. It then shows the proportions of subgroups who were unemployed. So it shows that 9.9 per cent of all sons were unemployed for at least this period, but this was true of 19.1 per cent of sons whose father was unemployed when they were 16. Whereas 15.4 per cent of sons whose father was in the poorest earnings quintile ended up unemployed for a year or more, this was true of fewer than 7 per cent of sons with fathers in the highest income quintile. Overall,

there is a reasonably marked inverse relationship between unemployment propensity and father's income level as measured by quintile. This relationship is in fact accentuated if we use the estimates of father's permanent status (the predicted values from the father's wage equation). Sons of fathers from the lowest *permanent* income quintile are three times as likely to have had such an unemployment history as are sons of fathers from the top quintile.

Table 5: Relationship between father's labour market status and likelihood of son's having been unemployed for at least one year in the decade prior to NCDS5

Sample description	Proportion unemployed (%)	Sample size
Overall	9.9	3,102
Father unemployed	19.1	457
Father in bottom income quintile	15.4	620
Father in 2nd income quintile	12.1	620
Father in 3rd income quintile	8.7	621
Father in 4th income quintile	6.5	620
Father in top income quintile	6.6	621

The figures given in Table 5 use an unemployment measure for sons that does *not* include those listed in the NCDS5 data as 'not in the labour force', as opposed to those 'unemployed and seeking work'. In the case of males especially, it may be the case that members of the sample who are not in the labour force are 'discouraged' workers, i.e. men who have given up seeking jobs because they believe that none are available, and hence are in some sense 'hidden' unemployed. Repeating the analysis for a wider subsample including those out of the labour force results in a similar picture. Just under 12 per cent of sons spent a year or more not in work, compared with 22 per cent of the sons of unemployed fathers and 18 per cent of sons of fathers in the bottom earnings quintile. Only just over 7 per cent of sons of top quintile fathers had this experience of being out of work.

To some extent, the value of the analyses to this point are limited by the fact that, while we observe the employment status of sons over a 10-year period, we have only been able to relate this to the employment status of the father at one point in time — the year in which the sons reached the age of 16. Given the limited nature of this information, the strength of the relationship between fathers' and sons' unemployment status is all the more remarkable.

Previous waves of NCDS data do, though, contain some more information that we can use specifically relating to whether or not the father was unemployed in the year in which the earlier waves were carried out, i.e. when the sons were seven and 11. Adding this information, which is still a series of snapshots, we can examine whether the results arrived at so far can be strengthened, and whether they are robust to different variable specifications. Table 6 presents sons' unemployment propensity results for subsamples of sons grouped by having fathers who were unemployed in one or more of the periods covered by the NCDS data.

Table 6: Relationship between likelihood of son's having been unemployed and father's unemployment at one or more points in the NCDS surveys

Sample description	Proportion unemployed (%)	Sample size
Overall	9.9	3,102
(a): Father unemployed, NCDS3	19.1	457
(b): (a) and father unemployed for >=1 week, year prior to NCDS3	15.0	310
(c): (b) and father unemployed for >=1 week, year prior to NCDS2	19.4	153
(d): (c) and father unemployed, NCDS1	50.0	26

Table 6 shows that, except for the case where all four NCDS variables on father's employment are brought into play, the proportion of sons unemployed in the different subsamples is roughly the same. For the case where the subsample is of those fathers who were unemployed in all the variables used, the unemployment proportion is much higher, but this may just be a quirk arising from an extremely small sample size. On balance, it would seem that the relationship previously identified, where having an unemployed father leads to a rough doubling of the son's unemployment propensity, seems to hold up well under different specifications of the father's unemployment variable.

It seems safe to conclude from this set of analyses that there is clear intergenerational transmission of 'poverty' through unemployment. Those people raised against a backdrop of unemployment are approximately twice as likely as the population in general to end up with a substantial history of unemployment themselves. Furthermore, those from poorer

backgrounds are also significantly more likely to end up unemployed than are those with better-paid fathers.

The Labour Market Outcomes of Lone Mothers

There are good reasons for believing a priori that lone parents represent an obviously disadvantaged group in society; certainly the image of single motherhood that is propagated in the media would lead one to take this view. With this in mind, we examined how the proportions of lone mothers with unemployed fathers/mothers, absent fathers/mothers and fathers/mothers in particular income quintiles compare with the overall population. In an additional attempt to narrow down the sample of lone mothers to an especially disadvantaged group, we repeated this analysis for those lone mothers who were never married, as opposed to separated/divorced. Table 7 gives the results.

The results of this analysis are interesting in that they largely fail to confirm prior views we might have had as to the origins of lone mothers. There is a slightly higher propensity to be a lone mother amongst the daughters both of unemployed and absent fathers, but it is nowhere near as pronounced as with our previous results on unemployment propensity. There is a slight relationship between father's income quintile and propensity, but this disappears once we use corrected estimates of permanent status. Splitting the sample by mother's status also fails to produce conclusive results. It should, of course, be stressed that these are results conducted on a specific cohort who, at the age of 33 by 1991, are less likely to be lone mothers, and particularly never-married lone mothers, than younger generations.[5] It is quite possible that the origins of newer cohorts of lone mothers are significantly different from those of this cohort. None the less, these results represent an interesting contribution to the debate over the origins of lone motherhood and particularly views of lone motherhood as part of an intergenerational cycle of deprivation.

[5] In addition, one should bear in mind here that the 'received view' of single mothers as hailing predominantly from poor backgrounds may be concerned with single mothers in their teens and twenties, who are not captured by the data we use.

Table 7: Proportions of lone mothers in subsamples chosen by father's and mother's labour market status

Sample description	Proportion of all lone mothers in sample (%)	Proportion of never-married lone mothers in sample (%)	Sample size
Overall, father's sample	6.2	1.4	2,933
Father unemployed NCDS3	8.8	0.9	114
No father NCDS3	7.5	1.6	253
Father bottom quintile raw income	7.3	2.0	586
Father 2nd quintile raw income	6.1	1.2	587
Father 3rd quintile raw income	5.8	1.0	586
Father 4th quintile raw income	7.2	1.9	587
Father top quintile raw income	4.8	1.0	587
Overall, father's permanent income sample	6.4	1.5	2,475
Father bottom quintile permanent income	6.0	1.6	495
Father 2nd quintile permanent income	6.5	1.8	495
Father 3rd quintile permanent income	7.1	1.8	495
Father 4th quintile permanent income	6.3	1.6	495
Father top quintile permanent income	6.3	0.6	495
Overall, mother's sample	6.2	1.3	3,071
Mother unemployed, NCDS3	7.1	1.2	1,187
No mother NCDS3	8.1	0.0	62
Mother bottom quintile raw income	6.4	1.5	614
Mother 2nd quintile raw income	7.7	0.8	614
Mother 3rd quintile raw income	6.7	2.2	614
Mother 4th quintile raw income	5.4	0.8	614
Mother top quintile raw income	4.9	1.3	615

The Labour Market Progress of Children of Disadvantaged Fathers

This section moves beyond simple descriptive statistics and unemployment proportion analysis of certain subsamples of the NCDS5 population by approaching the data from a

slightly different angle. Here, we take a subsample of sons in NCDS5 with fathers who were either unemployed at NCDS3 or in the lowest permanent income quintile at NCDS3 or both, and examine where the sons of this subsample end up on the NCDS5 income distribution, by quintile. As well as comparing this subsample's performance with that of the population at large, we can compare the outcomes of those members of the sample who do well (e.g. moving a long way up the income distribution compared with their background) and those who do badly (e.g. staying where they are, in the lowest quintile) and ask whether there are any differences between the groups (e.g. in terms of ability or educational attainment) that might account for some people being able to 'escape' from a poor background whilst others remain 'trapped' in poverty. In conducting this analysis, we are helped by the wealth of information on ability tests carried out by schools when the cohort members were seven years old, and the information on educational and vocational qualifications in the NCDS dataset.

Table 8 shows the proportions of the sons of these disadvantaged fathers in this subsample who are (a) out of work or (b) in income quintiles 1 through 5 of the overall sample income distribution. For the overall sample used in this case (those for whom we had adequate son's income data), the proportion with unemployment of a year or more was 8.6 per cent. The proportion of cohort members in each income quintile was 20 per cent by definition.

Table 8: Proportions of subsample of disadvantaged fathers experiencing various labour market outcomes

Labour market outcome	Proportion of subsample (%)
Unemployed at NCDS5	14.9
Bottom quintile, son's income	29.8
2nd quintile, son's income	24.9
3rd quintile, son's income	22.9
4th quintile, son's income	10.6
Top quintile, son's income	11.7

Table 8 shows that, once again, a significantly higher proportion of sons with disadvantaged fathers are unemployed at NCDS5 than in the population at large. In addition, these sons are to be found disproportionately towards the bottom end of the NCDS5 male income distribution: almost three times as many sons in the subsample are located in the bottom

quintile as are found in either of the top two quintiles. In short, as with the transition matrices described earlier, we see a limited but significant degree of upward mobility from the bottom of the distribution.

The next stage is to ascertain whether there are any attributes of the 'movers' up the distribution that distinguish them from the 'non-movers'. In making a first attempt to do this, we use the ability test and educational qualification information mentioned earlier. Taking ability first, NCDS1 (the survey conducted when the children were seven years of age) contains information on mathematics and verbal ability tests sat by the children. We examined the overall distribution of scores on both these tests. For the maths test, the distribution of marks is roughly normal. In the case of the verbal test, a large number of the children involved attain the top mark, i.e. the test was too easy to discriminate ability at the top end of the distribution; hence we concentrate on the maths test on the grounds that this gives us a better distribution of scores to work with than does the verbal test. The histograms in Figure 1 illustrate the distribution of marks for three subsamples of the distribution:

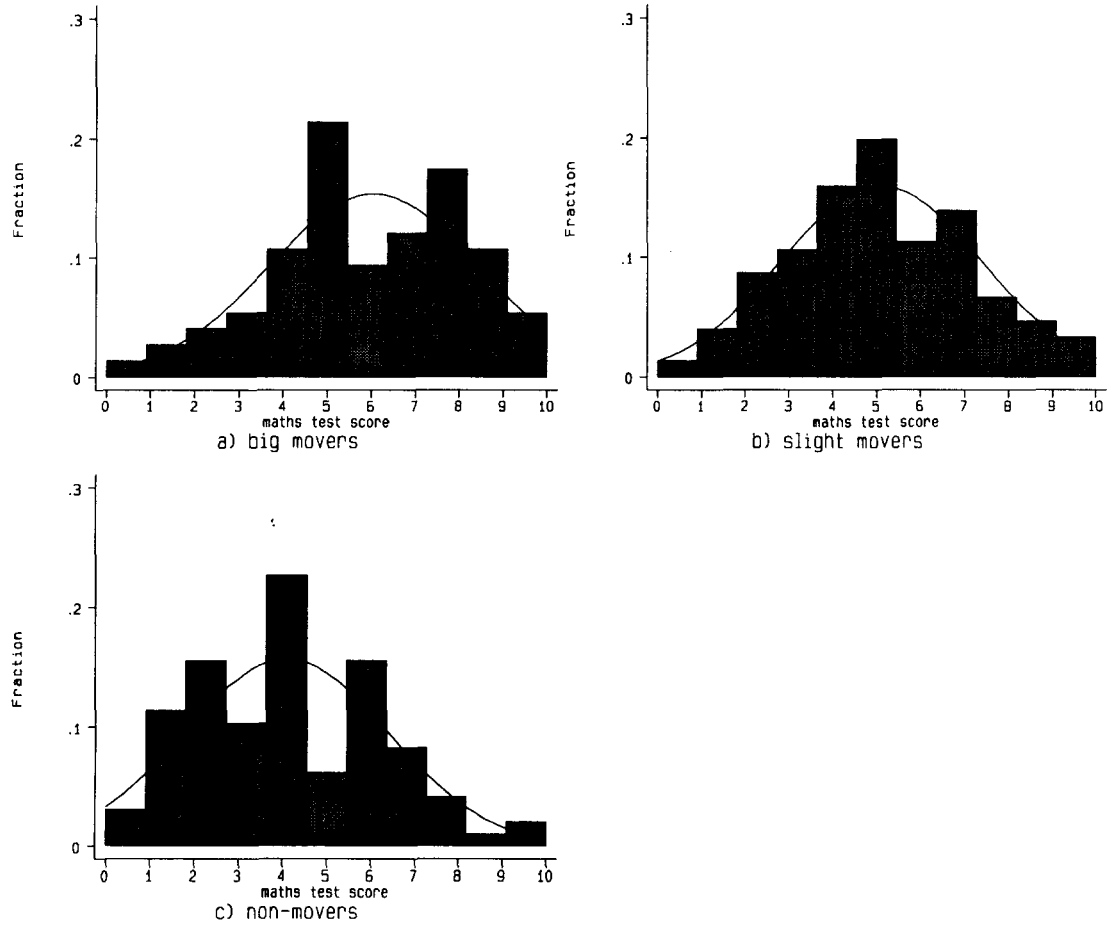
- those sons who end up in the bottom income quintile at NCDS5 ('non-movers');
- those sons who move to the 2nd or 3rd income quintile ('slight movers'); and
- those sons who move to the 4th or 5th income quintile ('big movers').

To help show what is going on, we overlay a normal curve on each distribution. Table 9 gives some descriptive statistics for the subsamples.

Table 9: Descriptive statistics for test scores of sons of poor fathers

Group	Mean of test score	Standard deviation of test score	Sample size
Big movers	6.04	2.37	75
Slight movers	5.09	2.28	151
Non-movers	4.08	2.32	97

Figure 1: Maths test scores by mover group for sons of poor fathers



As Figure 1 shows, there are clear differences in the distribution between the 'big movers' and the 'non-movers'. The 'slight movers' distribution comes somewhere in between the two. Table 9 backs this up: the non-movers score on average about one mark out of 10 less than the slight movers, who in turn do one mark out of 10 less well than the top movers. In short, the ability measure that we are using seems to correlate fairly strongly with the amount of movement up the distribution for these children from low-income backgrounds. Bright children do seem to have a better chance of escaping low incomes.

A useful extension to these results is to explore the link between these ability test scores and the educational attainment of the subsample. Table 10 shows the proportions of movers and non-movers who achieved each of four levels of educational attainment as measured in NCDS4:

- no qualifications;
- less than five O levels, lower-level vocational qualifications, or other lower-level qualifications (such as CSEs);
- five or more O levels, or mid-level vocational qualifications; and
- A levels, higher-level vocational qualifications, or higher qualifications (e.g. degrees).

Table 10 shows that there is a clear correlation between high mobility up the income distribution and a high level of educational attainment. Non-movers are almost five times as likely to have no qualifications as big movers; at the other end of the scale, big movers are more than seven times as likely to have A levels or better than non-movers are.

Table 10: Proportions of disadvantaged sons reaching levels of educational attainment, by mover group

(Cell size in parentheses)	*Level of educational achievement*			
Group	**No qualification**	**<5 O levels / lower-level vocational**	**5+ O levels / mid-level vocational**	**A levels / higher-level vocational**
Non-movers	52.6 (51)	23.7 (23)	18.6 (18)	5.2 (5)
Slight movers	27.2 (41)	33.1 (50)	23.8 (36)	15.9 (24)
Big movers	10.7 (8)	28.0 (21)	24.0 (18)	37.3 (28)

The Other End of the Distribution: Children of Rich Fathers and Fathers of Rich Children

We now examine the top end of the distribution. We are interested both in what happens to the children of fathers in the top quintile or decile, and from what family background those cohort members who were at the top of the NCDS5 income distribution came. To begin with the former question, Table 11 shows the proportions of sons of fathers who were in the top quintile of the NCDS3 income distribution (calculated using our permanent income estimates) ending up in each quintile of the NCDS5 income distribution.

Table 11: Proportion of sons of top-earning fathers in each quintile of son's income

NCDS5 income quintile	Proportion of sons of top earners in quintile (%)
Bottom	11.1
2nd	12.8
3rd	18.0
4th	23.6
Top	34.4

Like the transition matrices presented earlier, these results show a degree of intergenerational immobility: a son of a father in the top income quintile is over three times as likely to end up in the top quintile as in the bottom quintile. To analyse these results further, we show in Figure 2 an ability test analysis similar to that shown in Figure 1. This time, the non-movers are those sons who stay in the top quintile, 'slight movers' move down to quintiles 3 or 4 and 'big movers' move down to quintiles 1 or 2.

Again, there does appear to be a difference between the graphs, with the movers being of lower ability than the non-movers, although this time the trend is not as pronounced as before. From Table 12, we see that the differences between the means of the average scores of the different groups are not as large as they were in Table 9; this confirms that the correlation between ability and movement is weaker.

Table 12: Descriptive statistics for test scores of sons of rich fathers

Group	Mean of test score	Standard deviation of test score	Sample size
Big movers	5.89	2.37	74
Slight movers	6.37	1.91	131
Non-movers	6.76	2.24	98

Table 15: Where sons in the top decile came from

Father's permanent income decile	Proportion of top-decile sons with fathers in this decile (%)
Bottom	5.4
2nd	1.8
3rd	7.8
4th	4.2
5th	10.2
6th	11.4
7th	6.0
8th	15.6
9th	16.8
Top	21.0

The increase in the proportion of fathers hailing from each decile as we go up the distribution is not as smooth as for the quintile table, perhaps because of the smaller sample sizes involved; none the less, these results strengthen the conclusions that we arrived at from looking at the quintile distribution. In particular, sons in the top decile are over five times as likely to have fathers from the top two deciles as from the bottom two deciles.

Conclusions

Our conclusion from these data must be that groups of people at the extreme ends of the distribution are particularly subject to immobility. This is an important addition to information about mobility within the whole distribution, not least because of the special advantages and disadvantages associated with being at either extreme of the distribution. Nevertheless, there clearly are pathways between the extremes which some people tread. We have presented some very preliminary estimates, which indicate that able children of poor parents do have a better chance of moving into higher income bands than do the less able children. Clearly, much remains to be done in understanding mobility and lack of it, in

particular with regard to educational attainment, school quality and other variables. Much of this information is available in the data we have been using, and further work is intended.

References

Atkinson, A. B. (1981), 'On intergenerational income in Britain', *Journal of Post Keynesian Economics*, vol. 3, pp. 194–218.

Atkinson, A. B., Maynard, A. and Trinder, C. (1983), *Parents and Children: Incomes in Two Generations,* London: Heinemann.

Becker, G. and Tomes, N. (1986), 'Human capital and the rise and fall of families', *Journal of Labour Economics*, vol. 4, no. 3, pp. S1–S39.

Behrman, J. R. and Taubman, P. (1985), 'Intergenerational earnings mobility in the United States: some estimates and a test of Becker's intergenerational endowments model', *Review of Economics and Statistics*, vol. 67, pp. 144–51.

Dearden, L., Machin, S. and Reed, H. (1995), 'Intergenerational mobility in Britain', Institute for Fiscal Studies, Working Paper no. W95/20.

Solon, G. (1989), 'Biases in the estimation of intergenerational earnings correlations', *Review of Economics and Statistics*, vol. 71, pp. 172–4.

Solon, G. (1992), 'Intergenerational income mobility in the United States', *American Economic Review*, vol. 82, pp. 393–408.

Zimmerman, D. J. (1992), 'Regression toward mediocrity in economic stature', *American Economic Review*, vol. 82, pp. 409–29.