ON THE WEALTH DYNAMICS OF SWEDISH FAMILIES, 1984–98

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This paper focuses on three issues. First, it analyzes the increasing inequality of wealth in Sweden in terms of percentile age and birth cohort differences, and finds very weak evidence of life-cycle savings. There are rather strong birth cohort differences in wealth accumulation. Second, it is shown that bequests and inter vivo gifts contribute to the age and cohort differences in wealth, but do not increase the inequality of wealth. The third theme is mobility of wealth as a function of bequests, age, period, length of the transition period, and the magnitude of quantile differences.

1. INTRODUCTION

Measurement and decomposition characterize much of previous empirical research on the distribution of wealth. Using comparisons across nations and time and decomposition by type of asset and type of wealth holder we have attempted to better understand changes and cross-sectional differences in the distribution of wealth. Usually there is a focus on the inequality of wealth and in particular on the wealth share of the top 1 or 5 percent. This could be motivated by the finding that much of the activity goes on in the extreme right tail of the wealth distribution and by the influence of the very rich at the national level. However, the almost obsessed interest in the very rich does not justify only a modest interest for the remaining 95 percent of the population, in particular as the notorious difficulties in measuring wealth are particularly severe for the very rich.

In Sweden two data sources have been used. One is register data from self-assessments for taxation purposes and from employers, banks and brokers, and another is survey data. Estate data have (to my knowledge) only been used by economic historians in geographically very limited studies. Measures of inequality depend very much on what is included in the wealth concept as demonstrated in Bager-Sjögren and Klevmarken (1993). In particular, they found that the inequality of tax assessed wealth was much higher than the inequality of a wealth concept based on market values and with a broader coverage. Older Swedish studies that had to rely on self-assessment data thus probably exaggerated inequality as compared to later studies based on better data. In the last decade the quality of register data from Statistics Sweden has increased considerably and today much speak in their favor, but to get a longer perspective the Swedish Household Panel Surveys

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TABLE 1
PERCENTILES OF NET WORTH 1984–98 (1993 SEK)

Year	P10	P25	P50	P75	P90
1984	5,684	167,380	471,908	819,534	1,281,925
	(8,266)	(18,871)	(30,433)	(40,804)	(95,362)
1986	32,859	154,065	470,212	827,896	1,240,956
	(5,815)	(15,547)	(12,079)	(20,952)	(54,268)
1993	28,009	201,127	504,048	946,200	1,541,751
	(10,325)	(16,227)	(25,207)	(47,791)	(67,941)
1996	50,160	239,832	568,898	1,039,157	1,642,465
	(9,604)	(16,003)	(14,293)	(40,657)	(65,038)
1998	49,863	263,886	616,035	1,122,862	1,796,924
	(10,559)	(21,964)	(16,529)	(27,954)	(54,295)

Note: Standard errors in parenthesis include uncertainty from random imputations.

(HUS) are used in this study. They were originally designed using the U.S. Panel Study of Income Dynamics (PSID) as a model. Comparisons with register data can be found in Bager-Sjögren and Klevmarken (1993, 1998).

Previous Swedish estimates of the inequality of wealth (Spånt, 1987) show a decline from the beginning of the previous century to the middle of the 1970s. The decline then came to a halt (Jansson and Johansson, 1988). The inequality of wealth started to increase in the 1980s. Depending on inequality measure used the increase can be dated to the beginning, the middle or the end of this decade (SCB, 2000). It continued to increase through the 1990s. Table 1 and Figure 1 summarize the 1984, 1993 and 1998 net worth distributions as estimated from the HUS surveys. They demonstrate the increase in average wealth as well as the increase in inequality. Although the estimates of the 10th and the 90th percentiles are rather uncertain, the picture of a very small increase in the 10th percentile, and a strong increase of the 90th percentile, in particular during the second half of the period 1984–98, is quite clear. Median net worth also increased more than the 10th percentile did, but much less than the 90th percentile.

The Swedish changes in wealth more or less parallel those of other European countries and of the United States as summarized in Davies and Shorrocks (1999). One difference between Sweden and the United States is that the Swedish increase in inequality originated primarily from the extreme tails of the distribution as measured by the ratio between the 90th and the 10th percentiles, while in the U.S. this ratio as well as the quartile ratio had increased (see Klevmarken *et al*., 2003, Display 1). This finding for Sweden parallels that of Spånt (1987) who showed that the drop of the share of the top 10 percent in the period 1920–75 was almost all accounted for by the decline of the top 1 percent. Inequality among those below the top did not change much.

There are probably several explanations for the increase in inequality in the 1980s and 1990s. One is the aging of the baby boom cohorts who in these decades approached the peak of the age-wealth profile as predicted by the life-cycle hypothesis. Another is the increasing distrust in the social security system and increased private pension savings to compensate for anticipated cuts in compensation. A third is the deregulation of the capital markets at the end of the 1980s, and a fourth
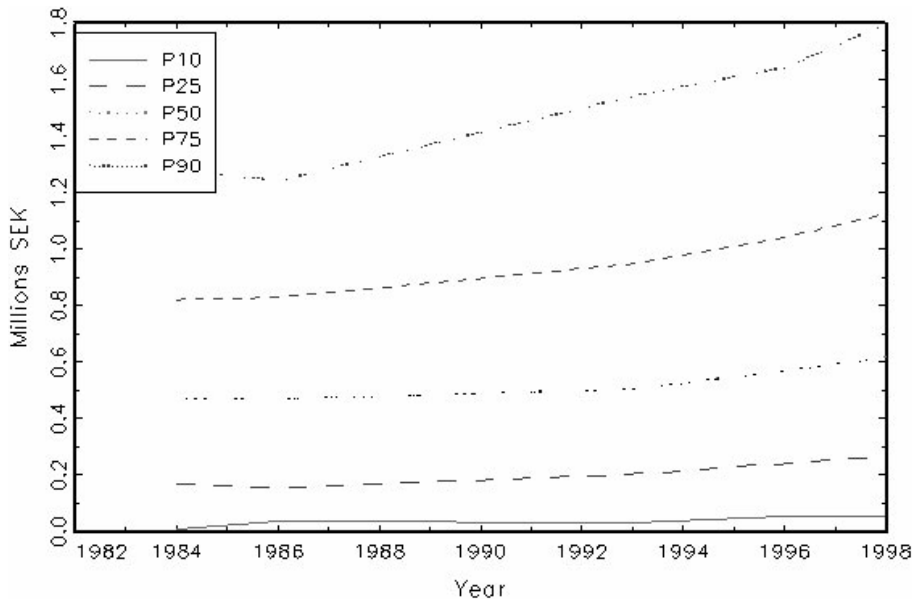
Figure 1. Percentiles of Net Worth 1984–98

the major tax reform in the beginning of the 1990s. Related to these changes there were rather dramatic changes in asset prices.[1]

The Swedish private savings rate peaked at about 12–13 percent around 1993–94 from a low of a few percent in the prior years. After 1993 the rate dropped back to below 5 percent in 1998 and 1999. One explanation to the peak in the time series is the reduction of debts after the tax reform in 1991. Debt ratios decreased in particular for high income and wealthy people. The savings rate then decreased as a result of the deep recession in the first half of the 1990s and falling real estate prices. It did not increase at the end of the recession, but continued to decrease reflecting a need to purchase durables, purchases that were postponed during the recession and which were boosted by favorable expectations about future income growth.

The importance of changes in asset prices to explain changes in the inequality of wealth has been documented in several studies: Spånt (1987), Pålsson (1993), Bager-Sjögren and Klevmarken (1998) and SCB (2000). Changes in the real price of homes and vacation homes primarily influence the center part of the wealth distribution. Real estate prices have been rather volatile. They peaked in the beginning of the 1980s, in the beginning of the 1990s and then again in the beginning of 2000. The troughs in the middle of the 1980s and in the middle of the 1990s were about 70 percent of the peaks. Over the entire period 1975–90 there was no increase in the real price of homes and vacation homes.

Increases in the prices of stocks and shares will primarily influence the right tail of the distribution. The increase in stock prices has been exceptional. In the

[1]See for instance Berg (2002, 2003).

period 1980 to the end of the 1990s the general index of the Stockholm Stock Exchange increased by a multiple of 17. The difference in price change between the real estate market and the stock market at least partly explains why the increase in wealth inequality in Sweden only is a move outward of the extreme right tail. Although not covered by our wealth data, the equally dramatic fall in stock prices after the peak in the beginning of year 2000 should have pulled in the right tail and decreased wealth inequality.

This study starts from the perspective of the life-cycle hypothesis and first focuses on the stability of age-wealth profiles by percentiles. This opens for a discussion of cohort and period effects on wealth and implications for the interpretation of the age-wealth relation. Is the reversed U-shaped cross-sectional profile a result of life-cycle savings or are there alternative explanations? The study then continues with an attempt to separate the life-cycle and bequest components of wealth using survey estimates of bequests. The final part of the paper is an analysis of how the percentile mobility of wealth depends on the time-span of mobility, the percentile width and age. We also estimate the contribution of bequests to the mobility of wealth.

2. DATA

Data for this study come from the Swedish household panel surveys HUS. For a general description and details about survey design and variables included, see the code-books (Klevmarken and Olovsson, 1993; Flood *et al.*, 1996; and the Internet home page of the HUS surveys).[2] The sample frame of these surveys was limited to non-institutionalized respondents in the age bracket 18–74. In the panel people were, however, interviewed also after the age of 74. All age groups are included in the analysis of this paper, but the number of observations beyond the age of 74 is less than proportional to the corresponding population totals.

The household concept used in these surveys defines a household to include people sharing the same dwelling and having meals together. Interviews were normally only conducted with the head and the head's spouse. The definition of a household is tied to the head. A household will almost always have the same head while other members living with the head might change.

Only one household member, normally the head and if the head was not available the head's spouse, was asked questions about real estate, assets and debts. The response should be given to include all household members.

Wealth data are available from the following waves of data collection: 1984, 1986, 1993, 1996 and 1998. Total net worth includes the following assets: owner occupied homes including condominiums, vacation homes, other real estate, savings and checking accounts, stocks and bonds, consumer durables, less mortgages and other debts. With the exception of 1984, life insurance and annuities are also included. When it was important to cover a long time period these two types of assets were, however, excluded, while in other cases when 1984 data were not used, they were included. Assets in the form of unincorporated business are always difficult to capture in wealth studies. No particular questions were asked about

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[2]http://www.handels.gu.se/econ/econometrics/hus/husin.htm.

this form of wealth until the 1998 survey. To maintain comparability with previous waves the value of unincorporated business was not included in the 1998 wealth figures of this study.[3] The share of this wealth component relative to total household wealth is, however, relatively small in Sweden, only about 3 percent in 1998. The responses to questions about financial wealth were given in bracketed form and then converted into Swedish crowns using bracket midpoints. Questions about real estate and mortgages were not bracketed. All asset data were transformed to constant 1993 Swedish crowns using the December CPI the year prior to the survey year.

Survey data on wealth is always burdened by non-response. To compensate for this problem Rubin's multiple imputation method was applied. Predictors used were assets with valid responses, average real estate prices by municipality, schooling of the head and a few demographic variables. Imputations were made at the sub-category level described in the previous paragraph and not at the total net worth level. The number of assets imputed thus varies from one household to another. For most assets 20–30 percent of the observations were imputed. In the 1980s the share of imputations was a little less than 20 percent while it increased to about 30 percent in 1998.

Imputations were done cross-sectionally which implied that imputed observations could not be used to study mobility. That would have inflated the mobility measures. For this purpose only observations without imputations were used. The disadvantage with this strategy is that we have to accept a relatively high non-response that might be selective. In future work it might be possible to increase the number of usable observations and then also the precision of estimates by a longitudinal imputation procedure.

3. AGE-WEALTH PROFILES

The life-cycle hypothesis suggests a hump-shaped relation between age and total wealth, and several studies have tested this hypothesis with varying success. The problem is that the profile does not always decay as quickly after retirement as predicted by the life-cycle hypothesis. To explain this deviation from theory it has been suggested that uncertainty about health and the need for care at the end of life and uncertainty about the length of life itself make people reduce their wealth less than suggested by the life-cycle hypothesis. Some people also want to leave bequests to their children.

Figures 2–6 display age-wealth profiles obtained from quantile regressions of net worth on age in the form of simultaneously estimated piecewise linear splines. The first two of these figures show the 10th, 50th and 90th percentile profiles for 1984 and 1998 respectively. The 10th percentile has almost no hump shape while the median profile has a clear hump that becomes even more pronounced for the 90th percentile. The peak of the 1998 profiles is around the typical retirement age of 65 as predicted by the life-cycle hypothesis. For 1984 the peak is not as well estimated. Although the estimated profiles are cross-sectional and not cohort

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[3]This does not imply that the self-employed are excluded from the sample, only that wealth invested in unincorporated and family business is excluded.
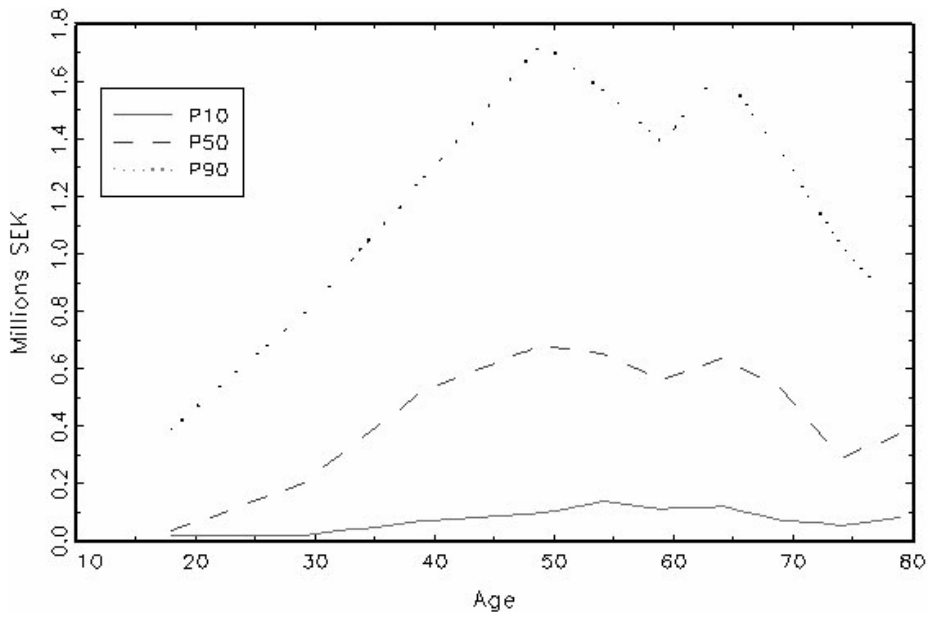
Figure 2. The 10th, 50th and 90th Percentiles of Net Worth by age in 1984
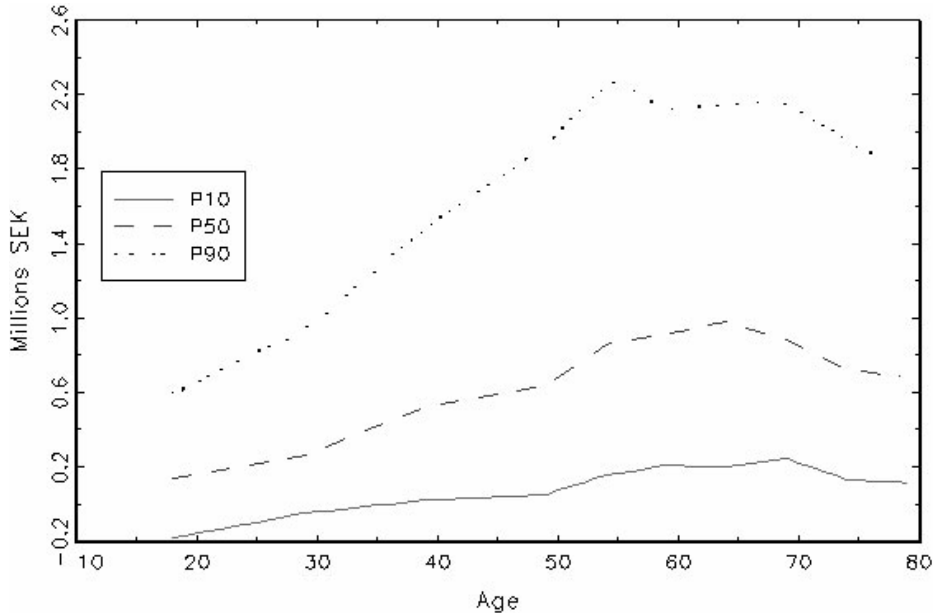

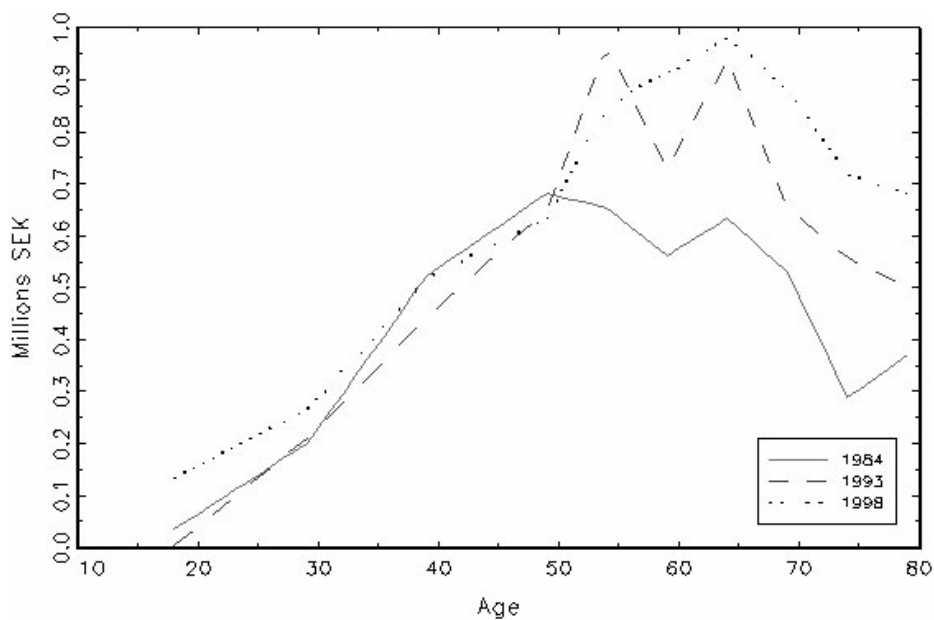Figure 3. The 10th, 50th and 90th Percentiles of Net Worth by age in 1998

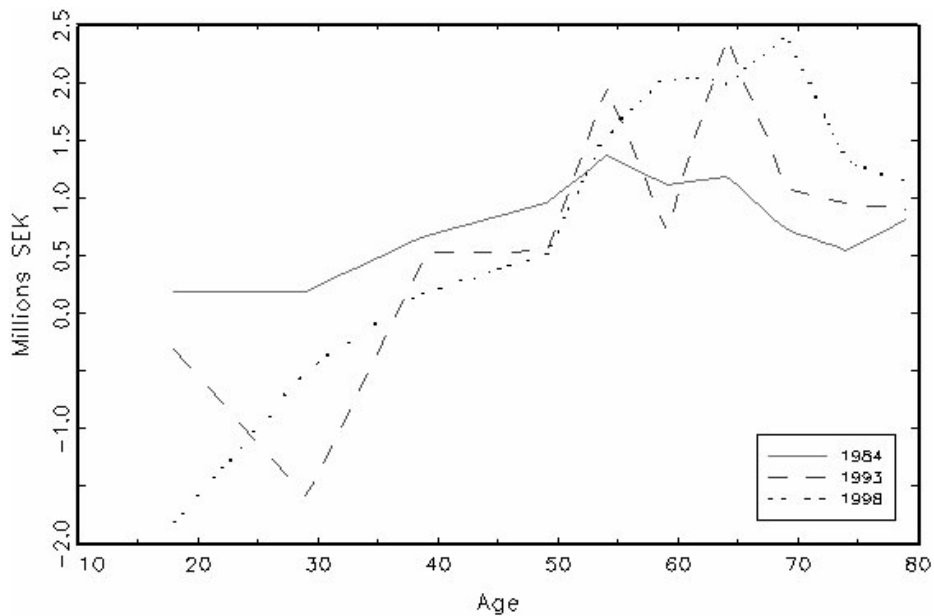Figure 4. Median Net Worth by Age in 1984, 1996 and 1998

Figure 5. The 10th Percentile of Net Worth by Age in 1984, 1996 and 1998
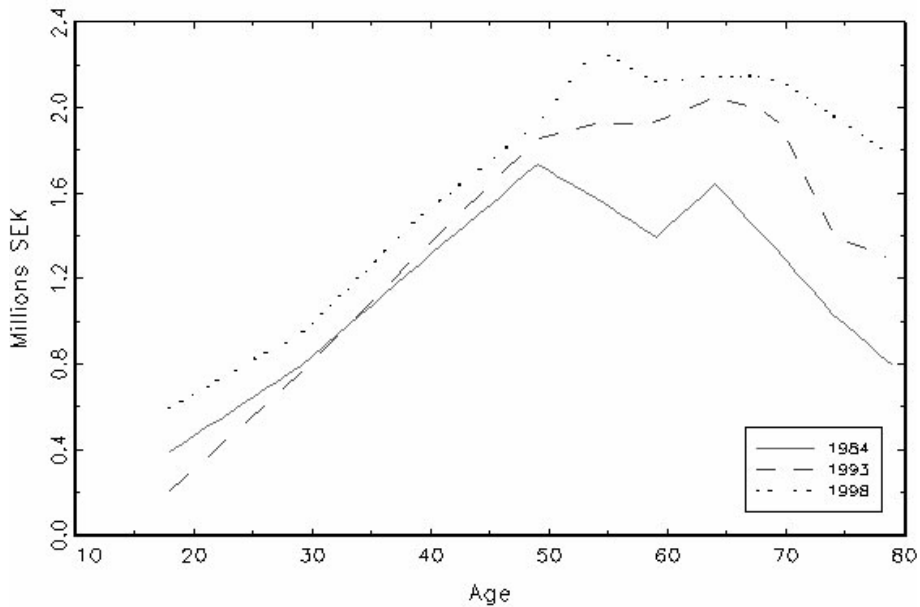
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Figure 6. The 90th Percentile of Net Worth by Age in 1984, 1996 and 1998

profiles the difference in shape between the 10th and the 90th percentile might suggest that the life-cycle hypothesis is a better explanation of behavior for the wealthy while there is very little life-cycle savings among the poor.

Figure 4 displays the median profiles for the three years 1984, 1993 and 1998. They do not show a stable relationship with age. While the first part of the pro-files up until the age of 45–50 is about the same, the peak becomes higher and is pushed towards a higher age in the later profiles. Older people have thus become wealthier. The profiles for the 10th percentile have become steeper (Figure 5) which implies that the age differences among the poor have increased. Young people are relatively less well of in the end of the 1990s compared to the middle of the 1980s. Similar to the median profiles the 90th percentile profiles peak higher and later in age at the end of the period (Figure 6). The lack of stability in the age-wealth pro-files suggests that there are other forces than stable life-cycle savings that deter-mine the wealth distribution. One alternative is that there are birth cohort differences in wealth accumulation, and another possibility is that there are period effects that interact with age. Unfortunately data have only been collected at five different time points which makes it very difficult if not impossible to identify and estimate any period effects interacting with age.

It is well-known that age, period and cohort effects are not all identified unless at least one of them can be captured by one or more explanatory variables, or a linear constraint is imposed. With the small number of periods covered by our data, an identifying restriction is necessary. One extreme alternative is to assume that there are no cohort effects but have each period represented by a dummy vari-able and thus allow the period effects to adjust freely to data. The period effects

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will then capture the average increase in wealth in the sample period, while the age effects will give an age-wealth relation which is an average of the age-wealth profiles in each of Figures 4–6 adjusted for the overall differences in wealth levels. This parameterization will thus give hump-shaped age-wealth profiles but not allow for changes in the shape of the cross-sectional profiles.

Another parameterization of the model is to assume no period effects but allow the cohort effects to capture changes in the wealth profiles. This parameterization will allow both for shifts and changes in the shape of the cross-sectional age-wealth profiles. It is also supported by independent evidence (see below). However, the interpretation of the birth cohort wealth effects become delicate. As will become obvious from the interpretation of the empirical results below we do not necessarily mean that people of different birth cohorts were born with different amounts of wealth; we rather think of these cohort effects as representing different experiences in life. It thus becomes conceptually difficult to distinguish between birth cohort effects and period effects interacting with age.

Table 2 gives the estimates of a model with no period effects. Note that the estimated age effects are annual increases within each age group, while the cohort effects are to be interpreted as deviations in level from the level of the birth-cohorts 1940–49. Although each cohort parameter is not very precisely estimated there is a clear birth cohort pattern. The older cohorts had less wealth than the younger cohorts. There is an interesting difference between the wealthy and the poor. For the 90th percentile the cohort effect continuously increases with each younger cohort. Do we see in these numbers the young affluent dot.com generation that was able to build up a fortune early in life? In the 10th percentile, however, the birth cohorts of the 1940s had more compared to both older and younger cohorts. Those who did not belong to the affluent dot.coms were thus relatively less successful.

The corresponding age-wealth profiles are displayed in Figure 7. They show a rather different picture compared to the unadjusted age profiles presented earlier. There is now no hump shape in the profiles of the 10th and 50th percentile and only a weak hump can be detected in the profile of the 90th percentile. With this parameterization of the model, wealth increases more or less linearly with age and there are clear advantages to younger generations. These results do not support the life-cycle hypothesis. There would seem to be very little of life-cycle saving in Sweden.[4]

Similar results have recently been reported from a Panel on Research Agenda and New Data for an Aging World (U.S. National Research Council, 2001). For the United States, The Netherlands, Italy and Japan this panel found strong trends across cohorts. Younger cohorts had considerably more household wealth than older cohorts at the same age. In the case of The Netherlands this was explained by the combined effect of less prevalent home ownership of the elderly than among the young and the rise in housing prices.

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[4]To an unknown extent the small number of observations above the age of 74 might have contributed to this result, in particular if the down turn of the age-wealth profile does not start until after this age.

TABLE 2
Percentiles of Net Worth by Age and Birth Cohort

	Est.	Std.
P10		
–29	−5,741.8	4,441.2
30–39	3,020.2	3,156.6
40–49	3,813.9	3,403.0
50–54	12,365.6	11,171.4
55–59	7,709.2	8,929.2
60–64	594.6	8,341.5
65–69	3,112.8	8,735.1
70–74	−1,696.4	7,689.9
75–	4,851.5	5,933.8
–1919	−123,003.1	34,799.4
1920–29	−75,319.8	30,835.0
1930–39	−9,337.5	19,475.6
1940–49	0.0	
1950–59	−17,159.2	20,808.6
1960–69	−74,178.7	24,411.1
1970–79	−95,661.9	43,692.1
Const.	80,575.7	48,041.6
P50		
–29	20,647.0	12,083.0
30–39	23,083.6	11,113.1
40–49	16,063.6	4,993.5
50–54	35,953.6	14,862.7
55–59	20,453.8	14,949.9
60–64	−875.1	17,584.1
65–69	33,199.9	23,334.5
70–74	−34,068.6	29,358.1
75–	21,876.5	15,466.1
–1919	−505,019.5	136,674.8
1920–29	−280,764.2	82,213.1
1930–39	−30,111.9	41,617.3
1940–49	0.0	
1950–59	−317.5	43,046.5
1960–69	−4,086.7	61,951.6
1970–79	86,415.6	203,764.6
Const.	31,407.6	112,116.0
P90		
–29	71,103.2	51,701.1
30–39	44,926.9	34,073.4
40–49	106,319.7	158,682.1
50–54	−32,973.7	335,559.2
55–59	46,343.9	94,994.7
60–64	57,751.0	151,690.5
65–69	21,021.0	187,669.9
70–74	−80,490.9	34,394.8
75–	36,852.5	31,890.4
–1919	−1,206,605.3	465,832.6
1920–29	−596,185.7	128,802.2
1930–39	−352,652.3	419,523.5
1940–49	0.0	
1950–59	95,356.3	239,102.5
1960–69	240,303.7	405,709.3
1970–79	366,784.5	402,367.9
Const.	−66,934.7	658,027.4

Note: Std are asymptotic standard errors including the variance due to random imputations.
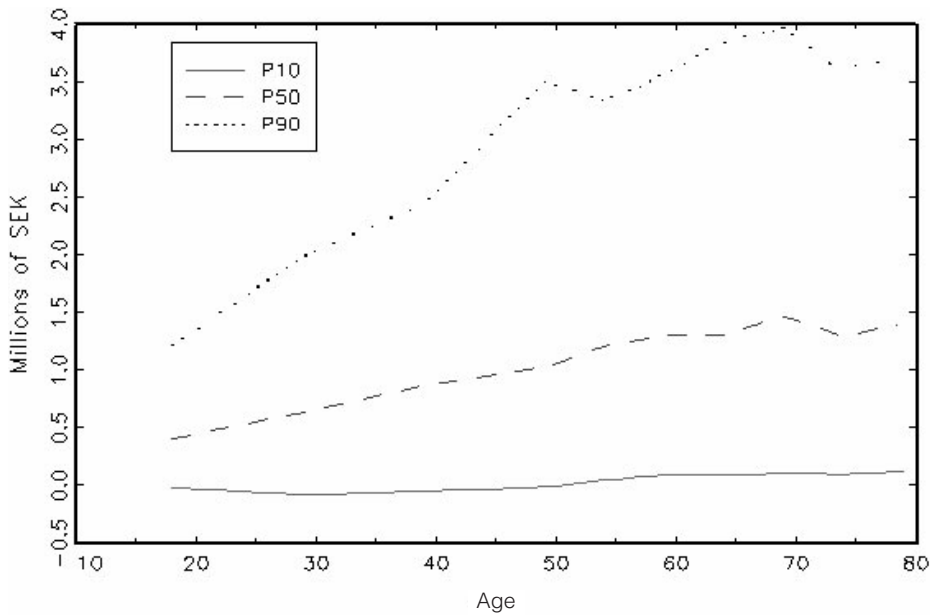
Figure 7. Percentile Age–Net Worth Profiles Net of Birth Cohort Effects

What explains the Swedish cohort differences in wealth? The cohorts of the 1940s could take advantage of the relatively prosperous 1960s and 70s, periods of relatively high growth not disturbed by periods of high unemployment. These cohorts were able to get a job and to keep it, buy a house or a condominium and then surface on the price increases in the real estate market and in the stock market. Older generations had to carry on the heritage of the depression in the 1930s and the war-time economy in the 1940s. Our results indicate a more divided picture for the post-war generations. As a matter of interpretation, some have been lucky and inherited wealth that has grown in the stock market and real estate market, while others who did not get an equally fortunate start were hurt by periods of low income growth and high unemployment in the 1980s and 1990s. Probably there are also cohort differences in private pension savings. The growing awareness in the 1990s of the future problems with the social security system has increased savings in private pension policies. It is unknown how much of this is just a real-location of already existing portfolios, but the young generations have probably generated new savings for this purpose.

Unfortunately it has not been possible to estimate models that also include period effects as for instance picked up by price changes in stocks and shares and in real estate, and changes in labor incomes. Even with richer data than have been available for this study the identification of all three effects is a delicate issue. Their separation will very much depend on the model specification. Alternative para-meterizations of the model will lead to alternative interpretations of data, but for the reasons given above we find the interpretation offered here plausible.

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TABLE 3

The Distributions of Inheritance and Gifts Among Those Who Received an Inheritance or a Gift (thousands of 1993 Swedish crowns)

Statistic	Inheritance	Capitalized Inheritance	Gifts	Capitalized Gifts	Inheritance and Gifts	Capitalized Inheritance and Gifts
Mean	270	480	88	173	283	511
CV	524	650	570	851	489	614
P10	19	22	4	4	14	17
P25	35	45	9	9	39	47
P50	76	96	17	19	87	107
P75	204	295	44	52	210	299
P90	499	754	120	144	508	761
No. of observations	724	724	404	404	816	816

4. The Relative Importance of Bequests

Blinder (1988) and Davies and Shorrocks (1999) summarize well the discussion about the relative importance of bequests. Estimates depend on the kind of data source used, but the latter authors conclude that a reasonable rough estimate is that inheritance contributes some 35–45 percent to aggregate wealth.

The 1998 wave of the HUS surveys includes questions about inheritance and gifts received that can be used to estimate the relative importance of these two sources of wealth in shaping the distribution of total net worth. Each household has been asked if they inherited and/or received any gifts at a value of more than 1,000 Swedish crowns;[5] if yes, how many times, when and how much. For each household it is thus possible to compute the capitalized value of inherited wealth and of gifts using various interest rates and assumptions about consumption out of the amounts received. In this paper the aim is only to get a rough idea of the relative importance of this kind of wealth and we will only use two different alternatives: the sum of all amounts received without capitalization and with capitalization to the real interest rate of 3 percent. On average median net worth increased by 1.9 percent annually in the period 1984–98. In the last five years of this period real net worth increased at a higher annual rate, 4.1 percent. Three percent might serve as a good compromise.

For the households that received a gift or inherited wealth, Table 3 gives a few descriptive statistics of the distributions of inherited wealth, gifts and the sum of the two with and without capitalization. Of the respondent households, 30.5 percent had inherited, 17 percent received one or more gifts, 13.2 percent both inherited and received gifts, and 34.4 percent inherited or received a gift. Using similar data from the U.S. Survey of Consumer Finances, Wolff (2002) obtained estimates of almost the same order. Depending on year the percentage of households receiving wealth transfers varied from 20.4 to 23.5 percent.

Although one would have to look more closely at the timing of gifts and bequests and find out who the donator is before any firm conclusions can be drawn

[5]Approximately US $130.

TABLE 4

THE 1993 DISTRIBUTION OF NET WORTH COMPARED TO DISTRIBUTIONS WITH INHERITANCE AND GIFTS
SUBTRACTED (THOUSANDS OF 1993 SWEDISH CROWNS)

Statistic	Net Worth	Net Worth Less Inheritance and Gifts	Net Worth Less Inheritance and Gifts Capitalized by 3%
Mean	928	831	752
CV	117	154	273
P90-P10	1,961	1,846	1,832
P90-P10/P50	2.81	2.92	3.01
P10	56	30	14
P25	284	243	227
P50	699	632	609
P75	1,258	1,172	1,153
P90	2,017	1,877	1,845

Note: Net worth includes life insurances and annuities.

about gifts as an early substitute for bequests, the fact that almost all gifts go to households that also inherit suggests that the two should be treated as one and the same type of intergenerational transfer. The median capitalized sum of gifts and inherited wealth is a little more than 100,000 Swedish crowns and the 90th percentile almost 800,000. Gifts are typically smaller than amounts inherited. The mode of the distribution of single gifts is 10,000 Swedish crowns. The reason is almost certainly that gifts larger than 10,000 are due to gift tax. The median of the sum of all gifts received is about 17,000 Swedish crowns. The median of the sum of all inherited wealth is 75,000. These amounts are thus relatively small, but the distributions are heavily skewed. The corresponding means are 90,00 and 270,00 Swedish crowns respectively. The mean of all capitalized transfers was 511,000 and the median only 107,000 crowns. The corresponding U.S. estimates (Wolff, 2002, Table 1) are five to six times higher.

Table 4 displays the net worth distribution with and without inheritance and gifts. The 1998 mean net worth in 1993 Swedish crowns was 928,000. Net of inheritance and gifts without capitalization it was 831,000 and with capitalization 752,000 Swedish crowns. In neither case was anything subtracted for consumption purposes. The shares of inherited wealth and gifts out of total net worth with and without capitalization thus become 19 and 10.5 percent. These numbers are low compared to the best estimates of Davies and Shorrocks (1999), but they are in the same range as some of the previous estimates from survey data. For instance, in the U.S. Panel Study of Income dynamics (PSID), it was found that only one in five households had received any financial inheritances as of 1984. Smith (1999) estimated that inheritances would account for only 13 percent of PSID 1984 wealth values, as well as 13 percent of the increment in wealth between 1984 and 1994. The estimates in Wolff (2002) are higher. The share of the present value of transfers to net worth ranged from 19.4 to 35.5 percent. It is generally believed that survey data underestimate the share of bequests out of total net worth because surveys have difficulties in capturing households with the largest fortunes, most of which are believed to originate from bequests. It is impossible to know without additional information on the very rich if this is the explanation

to the comparatively low figures in our case or if bequests are relatively less important in Sweden with its low wealth dispersion and high tax on bequests and gifts.[6]

If most of the very large fortunes are inherited, then one would expect that the wealth distribution net of bequests would be more equal than the distribution including these sources of wealth. It is then interesting to note from Table 4 that this is not the case. Inherited wealth and gifts make the distribution of net worth more equal! All inequality measures in this table give the same result. A tabulation of the present value of all transfers by net worth of the receiving household in Table 5a shows that more wealthy households more frequently receive a transfer than those less wealthy, and that their transfers are larger. There is, however, one major exception. Households belonging to the first decile receive transfers more frequently than households in all other deciles and the amounts transferred are several times higher.[7] Table 5b, which displays transfers by the age of the household head at the time when they were done, shows that the median bequest is relatively high among young households. This suggests that the first decile of the wealth distribution includes a high share of young households and even recipients that were children at the time they received a transfer.

Even if the first decile is disregarded bequests are relatively more important for the poor than for the wealthy. In the second decile transfers add about 40 percent to net worth, while in the top decile it is less than 10 percent. Again, this might be the result of an inability of the survey to capture the very large bequests, but among the 95 percent of the population who do not belong to the very rich, bequests tend to make the wealth distribution more equal. The explanation is that in most cases estates are split over several heirs, that assets are transferred from wealthy to less wealthy and that although most amounts are rather small, even small amounts mean relatively much to people who are not so wealthy.

Bequests and inter vivo gifts will, depending on when during the life course they are received, influence the shape of the wealth profiles. Previous studies have demonstrated a positive correlation between wealth and survival that might suggest that children of more wealthy people inherit at a relatively old age. But if there is also a positive correlation between schooling and wealth, they might have chosen to have children relatively late, which would balance their higher longevity. Because the 1998 HUS wave includes data on when each bequest and gift was obtained, it is possible to estimate the age of the recipient at the time the transfer took place.[8] Table 5b reports the share of all bequests (gifts) received prior to the interview in 1998 by age group, as well as the median value transferred by the age of the recipient. The median age of inheritance is 46 years and the quartiles 36 and 55 respectively. Most heirs are thus middle aged. Disregarding the first age

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[6]The larger wealth in the form of unincorporated and family business in the United States probably contributes to this difference between the two countries.

[7]In Wolff (2002) there is a similar table which consistently shows that the percentage of households with transfers and the mean transfer increase with increasing wealth. It is, however, not explicitly mentioned whether transfers are tabled by wealth gross or net of the transfers received. Similarly, when transfers were grouped by the age of the household head, the text does not say if it was done by the current age of the head or by the age when the transfer was received.

[8]This is the age of the household member who reported about bequests and gifts (usually the household head) in the year of transfer.

TABLE 5a

INTERGENERATIONAL TRANSFERS AS OF 1998 BY DECILES OF THE NET WORTH OF THE RECEIVING
HOUSEHOLD

Decile of Net Worth Net of the Present Value of Bequests and Gifts (thousands of 1993 SEK)	Share of Households that Inherited or Received a Gift	Household Mean of all Transfers (Bequests + Gifts) (thousands of 1993 SEK)	75th Percentile (thousands of 1993 SEK)	95th Percentile (thousands of 1993 SEK)
1 (14)	48.4	1,096	239	3,276
2 (148)	23.1	36	0	187
3 (302)	28.6	44	14	253
4 (462)	30.8	75	34	446
5 (610)	34.3	75	52	406
6 (796)	29.3	56	27	365
7 (1,017)	29.2	57	16	372
8 (1,322)	39.0	84	66	568
9 (1,845)	38.6	85	65	524
10	43.1	149	114	596

Note: All transfers have been recomputed to their present value in 1998 using a real rate of interest of 3% and converted to 1993 Swedish crowns. The table gives means over ten replications of imputed net worth.

TABLE 5b

BEQUESTS AND INTER VIVO GIFTS BY THE AGE OF THE RECIPIENT AT THE TIME OF THE TRANSFER
(THOUSANDS OF 1993 SWEDISH CROWNS)

Age when Transfer was Received	Bequests			Inter Vivo Gifts		
	Percent of All Bequests	Median Bequest	No. of Bequests	Percent of All Gifts	Median Gift*	No. of Gifts
1–20	4.41	109	25	2.46	10	12
21–30	10.40	53	59	23.15	5	113
31–40	20.82	44	118	28.90	9	141
41–50	28.57	73	162	29.59	9	144
51–60	22.57	48	128	11.47	9	56
61–	13.23	34	75	4.51	9	22

Notes: Median values are in 1993 SEK.
*The typical gift is 10,000 SEK in nominal terms; see explanation in main text.

group with relatively few observations, the table also shows a peak of the median bequest in the 41–50 age group. These results thus suggest that bequests enforce the peak of the cross-sectional age-wealth profile. Gifts are also transferred primarily to middle aged people. The median age is a little lower than for bequests, namely 39 years. The amounts transferred are, however, usually relatively small and the median amount about the same in all age groups. Gifts are thus not likely to have any major influence on the shape of the wealth profiles.

The interpretation of the results in Table 5b is, however, not as straightforward. A closer look at the data shows that bequests and gifts have been reported much more frequently in the ten years immediately prior to 1998 than earlier. Although it is likely that rising household wealth has increased the number of transfers, it is also possible that respondents tend to forget transfers received long

ago. Memory errors should thus result in underestimates of the number of transfers at a relatively young age of the recipient, but not necessarily any systematic errors in the age dependent median values. A median regression indicates that the median transfer has decreased while there is no partial relation with age. The peak we see in Table 5b could thus be the result of changes in the frequencies of transfer and amounts transferred rather than age related differences in amounts inherited. It is likely that intergenerational transfers increase from below as people become wealthier, and as most bequest are received in middle age the median sum transferred in this age will increase. If this is true, bequests explains at least partially the relatively high wealth of the baby-boom cohorts.

5. Wealth Mobility

The concept of mobility is related to the relative position of a family in the wealth distribution. A move up (down) in rank will normally but not necessarily imply an increase (decrease) in wealth. It will depend on how the whole distribution is shifted. Similarly, no change in rank does not exclude an increase (or decrease) in wealth. Usually mobility is measured relative to the quantiles of a distribution. As the quantiles change over time and differ across heterogeneous groups of wealth holders and across nations a move from one quantile to another might imply a very different move in terms of Swedish crowns or dollars depending on the context.

Quantile mobility in wealth is largely a result of initial heterogeneity in wealth, behavior and variable returns on investments. Unevenly distributed inherited tangible wealth and human capital give people different initial opportunities to accumulate further. There are also differences in the desires to postpone current for future consumption, and in the willingness to accept risks in exchange for higher returns. Simple differences in life-cycle stages is a fundamental cause of variation and hence mobility. Much of the heterogeneity in initial wealth and in behavior is best seen as random phenomena. Also events at least partly beyond individual control such as sickness, accidents and lottery gains add to the randomness of mobility. Finally there is the behavior of the macro economy, financial markets and responses to public policy that will contribute to the mobility of wealth.

The literature on mobility was reviewed in Bager-Sjögren and Klevmarken (1998). In summary they noted that the position in the life-cycle was important. Except possibly for the very young, the young and middle aged increase their wealth relatively rapidly. Marital status and changes in marital status contribute to mobility. To divorce or get widowed imply a high probability of losing in rank in the distribution of wealth, and those who stay single also have a higher probability to lose than to gain in rank. People who have a higher education and get managerial and similar white-collar jobs tend to increase their relative wealth position. Their review also found that the portfolio composition determines mobility when asset prices change differentially.

Klevmarken *et al*. (2003) compared the mobility of wealth in Sweden and the United States using a matching technique. Contrary to what one might have expected, quantile mobility is higher in Sweden than in the U.S. A quantile in the

TABLE 6
Transition Matrices 1996–98 and 1984–98

1996–98

		1998				
Shorrocks' mobility measure = 0.600						
Quintiles		1	2	3	4	5
1996	1	**0.669**	0.244	0.055	0.024	0.008
	2	0.213	**0.449**	0.252	0.047	0.039
	3	0.070	0.240	**0.426**	0.194	0.070
	4	0.040	0.040	0.230	**0.429**	0.262
	5	0.008	0.031	0.031	0.304	**0.625**

Note: This matrix is based on 637 observations.

1984–98

		1998				
Shorrocks' mobility measure = 0.827						
Quintiles		1	2	3	4	5
1984	1	**0.407**	0.389	0.093	0.056	0.056
	2	0.241	**0.204**	0.259	0.204	0.093
	3	0.204	0.185	**0.222**	0.222	0.167
	4	0.111	0.167	0.296	**0.296**	0.130
	5	0.036	0.055	0.127	0.218	**0.564**

Note: This matrix is based on 271 observations.

Quintiles (SEK 1993 price level)

	1984	1996	1998 (84)	1998 (96)
Q1	149,442	155,529	208,517	156,161
Q2	386,643	384,235	502,029	390,291
Q3	641,092	672,125	911,586	713,947
Q4	974,663	1,105,681	1,459,625	1,171,326

Note: The third column gives the 1998 quintiles used for the 1984–98 transition matrix, and the fourth column the quintiles for the 1996–98 matrix.

U.S. is, however, wider than a Swedish quantile, and after standardization for this difference (and differences in demographic composition) they found that quantile mobility was about the same in the two countries.

Table 6 details two transition matrices, one for a short transition 1996–98 and one for a longer period 1984–98. While the former is based on more than 600 observations, attrition reduced the sample size of the 14 year transition matrix to less than 300. A comparison of the 1998 quintiles for the two matrices—the last third of the table—shows that the 1996–98 sample has a longer left tail than the 1984–98 sample. This might be due to attrition, but another explanation is that the 1984–98 sample on average was older in 1998 than the 1996–98 sample. Any difference between the two transition matrices might thus not only depend on the difference in span covered, but also on the difference in age. We will return to this issue below, but first note a few stylized characteristics of the two transition matrices.

The diagonal elements are all smaller in the 1984–98 matrix than in the 1996–98 matrix, which implies that mobility increases with the span of the period

covered. This is also picked up by Shorrocks' mobility index. Most of the mobility takes place in the middle of the distribution. The probabilities to stay poor and remain rich are both relatively high. For the short transition period they are of the same magnitude, but the probability to stay poor decreases by about 40 percent when the span of the period is extended from 2 years to 14 years while the probability to remain rich only decreases by 10 percent. Judging from these results, in the long run it thus becomes easier to get out of poverty than to lose a fortune!

Previous studies have shown that mobility depends on age. People in the middle age brackets tend to move up the distribution, while people who have retired move down the distribution, at least if the life-cycle hypothesis is true. Age-standardized transition matrices will, however, not capture these moves. They will show mobility relative to the quantiles of each age group. Because the quantile differences tend to increase with age, c.f. above, one might expect that mobility should decrease when measured in transition matrices by increasing age. Table 7 gives Shorrocks' measures for three age groups and two transition periods. They show a weak negative association with age. The number of observations in the last age group is, though, very small. In an attempt to compensate for this the 1984–86 and 1996–98 matrices were weighted together and the Shorrocks' measure computed for the joint matrices. The result is given in the last column of the table. It only shows a mild decline with increasing age.

We have found that wealth mobility depends on the length of the transition period; in Klevmarken *et al*. (2003) most of the difference in mobility between the United States and Sweden was motivated with the larger quantile differences in the U.S., and finally, Table 7 indicates that mobility might change over time. The 1996–98 mobility is lower than the 1984–86 mobility. Because the HUS panels have wealth observations from 1984, 1986, 1993, 1996 and 1998 transition matrices can be estimated for all pair-wise combinations of these years. That will give 10 different transition matrices. For each matrix there is a Shorrocks measure that can be used in an attempt to capture the relative importance of the effects of the three variables on mobility. The following function was estimated,

(1) $$\ln(s) = \ln(a) + b/x_1 + c\ln(x_2) + d\ln(x_3) + e$$

where s is Shorrocks' measure, x_1 is the spell length, x_2 the average of the quintal differences Q_4–Q_3, Q_3–Q_2, Q_2–Q_1 in 1,000 Swedish crowns, and x_3 the calendar mid-point of the spell (last two digits of the year with one decimal point). The OLS estimates can be found in Table 8. The intercept should be close to zero as the Shorrocks' measure has an upper limit of 1. The point estimate is not zero but the standard error is so high that it is not significantly different from zero. The esti-

TABLE 7

Shorrocks' Mobility Measure by Age

Age Group	1984–86	1996–98	Combined 1984–86 and 1996–98
–44	0.734	0.605	0.666
45–64	0.736	0.601	0.647
65–	0.705	0.557	0.609

TABLE 8

OLS Estimates of the Log of Shorrocks' Mobility Measure as a Function of Spell Length, Quintal Range and Period

Parameter	Estimate	Std	t-value	Estimate	Std	t-value
ln(a)	3.707	2.492	1.49	3.382	2.364	1.43
b	−0.438	0.156	−2.81	−0.506	0.119	−4.22
c	0.038	0.053	0.72			
d	−0.953	0.584	−1.63	−0.800	0.524	−1.52
R-square	0.777			0.757		

mate of b is significantly negative which implies that s will approach its upper limit from below for increasing spell length. There is a negative time trend—mobility decreases—but the corresponding P-value is only 0.15. The estimate of the elasticity of the quintal differences is not significantly different from zero. There is thus no indication that higher wealth dispersion will have a negative effect on the mobility measure. It is of course difficult to get much mileage out of only ten observations from one country. It should be an interesting exercise to combine data from different countries and studies given that the wealth concepts were approximately comparable.

Just by inspection of the transition matrices it is easy to see that every quintile can be reached from every other quintile and that there are no periodic or absorbing states. This implies that these matrices are ergodic and that there exist limiting matrices and a limiting distribution that is independent of the initial distribution. It turns out that all matrices have the same limiting matrix—a matrix with all entries equal to 0.2—and that the limiting distribution is the same as the observed destination distribution—a distribution with the frequencies 0.2 for each of the destination quintiles. The time it takes to reach the limit depends on the mobility of the matrix. The higher mobility, the less time to reach the limit. The transition matrices that only have a span of two years reach their limit in 12–14 years. The observed processes are thus non-egalitarian in the sense that they tend to preserve the observed (destination) distribution of wealth, but they are also egalitarian in the sense that the probability to become rich or poor is the same for everyone and independent of initial wealth. This is a statement about the properties of the observed process and not a prediction about a future distribution of wealth. A simple Markov model is not likely to capture well the trajectory of a wealth distribution. One interpretation of these results is that there is a built in tendency in the wealth process to move in the direction of equal chances, but the limit is never reached because new shocks change the direction all the time.

Until now mobility has been estimated using different quintiles in the origin and the destination. An alternative is to use quintiles estimated from the joint distribution of origin and destination. Examples are given in Table 9 for the transitions 1984–86 and 1996–98. For the latter transition there are two alternatives, one with life insurance and annuities included and one with these assets excluded. The 1984–86 matrix is only available without these assets. Mobility becomes a little higher when they are included. These matrices differ from those previously esti-

TABLE 9

TRANSITION MATRICES WITH COMMON ORIGIN AND DESTINATION QUINTILES

	1996–98 Without Life Insurance and Annuities					1996–98 With Life Insurance and Annuities				
Quintile	1	2	3	4	5	1	2	3	4	5
1	**0.65**	0.25	0.08	0.01	0.01	**0.63**	0.26	0.08	0.01	0.01
2	0.22	**0.43**	0.27	0.05	0.03	0.20	**0.42**	0.30	0.05	0.03
3	0.06	0.23	**0.40**	0.24	0.07	0.05	0.20	**0.35**	0.28	0.11
4	0.03	0.05	0.15	**0.47**	0.30	0.04	0.04	0.18	**0.41**	0.34
5	0.02	0.02	0.05	0.22	**0.68**	0.02	0.02	0.03	0.26	**0.67**
	Shorrocks = 0.592					Shorrocks = 0.627				

	1984–86 Without Life Insurance and Annuities				
Quintile	1	2	3	4	5
1	**0.67**	0.15	0.13	0.02	0.02
2	0.18	**0.35**	0.26	0.16	0.06
3	0.11	0.20	**0.36**	0.21	0.12
4	0.02	0.10	0.29	**0.37**	0.21
5	0.00	0.03	0.11	0.19	**0.67**
	Shorrocks = 0.645				

	Quintiles				Limit Distribution Frequencies		
	1984–86 Without	1996–98 Without	1996–98 With	Quintiles	1984–86 Without	1996–98 Without	1996–98 With
Q1	134,482	155,502	178,990	1	0.174	0.172	0.134
Q2	434,648	387,906	434,261	2	0.154	0.176	0.142
Q3	653,844	693,918	773,556	3	0.229	0.178	0.165
Q4	977,428	1,141,176	1,241,533	4	0.196	0.211	0.235
				5	0.246	0.262	0.323
No. of obs.	472	689	689				

mated in that they capture the general increase in wealth. Probabilities to the right of the main diagonal are in general higher than are those to the left of the diagonal. The whole distribution slides up the wealth axis. These matrices are ergodic too. The limiting matrices have all rows equal, but all elements are not equal. Although there is a concentration to the two highest quintiles, it is interesting to note that in the limit the whole distribution will not be concentrated to the highest quintile; more than 10 percent will end up in the first quintile. The limiting distributions are displayed in the last panel of Table 9.

Thus, the mobility processes move in the direction to give people equal chances independently of whether they start out poor or wealthy, but there is no strong tendency to decrease the cross-sectional inequality of wealth.

Finally we will investigate what bequests imply for mobility. To do so two transitions will be considered: 1993–98 and 1996–98. From the 1998 total net worth figures, inherited wealth and gifts received in each of these periods were subtracted and the corresponding transition matrices and Shorrocks' measures computed. They were then compared to the original matrices and measures. Table 10 summarizes the results when only complete observations without any imputations

TABLE 10

Shorrocks' Mobility Measure for Transition Matrices With and Without Bequests and Gifts

	1993–98	1996–98
With inherited wealth and gifts	0.698	0.602
Net of bequests	0.701	0.608
Net of capitalized bequests	0.704	0.608

Note: All transition matrices were defined using the quintiles of the wealth distributions net of capitalized bequests and gifts.

were used. For the longer period Shorrocks' measure is 0.7 whether bequests and gifts are netted out or not, and for the shorter period this measure is 0.6. To increase the sample size the same analysis was also repeated, allowing at most two imputed wealth components in the measure of total net worth. All mobility measures then increased a little, but there was still no significant difference in mobility when bequests and gifts were netted out. We thus find virtually no effect on mobility from bequests and gifts. The same conclusion is reached after inspection of the transition matrices. The explanation is that in these short periods the number of households that receive a transfer is rather small and the amounts transferred are typically small too. Mobility in periods of the length analyzed here thus have other explanations as discussed above than that households inherit or receive inter vivo gifts.

6. Conclusions

Cross-sectional age-wealth profiles are hump-shaped, but they are not stable and wealth has become more concentrated to the elderly. The birth-cohorts included in this study have experienced very different opportunities in accumulating wealth. Later generations have been more fortunate than older generations. Among the younger generations we also see an increasing inequality in wealth. Some have been very successful while others have not been able to accumulate at all. As a matter of interpretation almost the whole hump in the cross-sectional profiles can be attributed to differences in birth-cohorts which would imply that there is very little life-cycle savings in Sweden. The almost constant increase with increasing age in wealth net of the cohort differences would then have other explanations such as uncertainty about the need to cover expenses for health and care at the end of life and a desire to bequeath one's children.

Bequests and inter vivo gifts contribute to both the level and the shape of wealth profiles. Our survey estimates suggest that this source of wealth contributes less than 20 percent of total net wealth. Most transfers have gone to middle aged recipients and thus boosted the hump of the cross-sectional wealth profile. It is, however, not obvious that this is a pure age pattern. Bequest behavior is probably changing. As more people become wealthy the number of bequests increases while the median amount transferred decreases. The baby boom cohorts have probably received more in the form of intergenerational transfers than previous generations at the same age.

Contrary to what many believe, bequests do not increase the inequality of wealth. Our estimates rather suggest that it decreases. The explanation is that many estates are split over several heirs, that assets are transferred from wealthy parents to less wealthy children, and that small amounts transferred mean relatively more to people who are not wealthy. The very accumulation of wealth with the motive to give bequests is, however, likely to increase the inequality of wealth. The bequest motive thus increases inequality while the actual transfer to younger generations decreases inequality. These results might suggest reconsideration of the relatively high Swedish taxes on inherited wealth and on gifts for all but very large transfers.

Even if we have found that there are average life-cycle changes in wealth that depend on the experiences of each birth cohort, and that bequests contribute both to these average changes and to jumps in the wealth of individual households, there are many additional factors that trigger individual moves up and down the wealth distribution. Some people make good investments and gain in wealth while others make bad investments and lose. Some want and can accumulate wealth while others prefer to consume or are put in a situation in which they have to consume. Life-cycle changes will tend to push people up in the wealth distribution and perhaps also down at the end of life, but individual mobility that has other explanations is at least as important for the wealth of a single household. Our results suggest that mobility around the average age-wealth profile is almost the same in every age group. We only found a weak decrease in mobility with increasing age. Our results also suggest that windfall gains in the form of bequests and inter vivo gifts do not contribute much to mobility in Sweden. Most transfers are too small and infrequent to have a major impact on a general measure of mobility. Of course, this finding does not exclude the fact that the few households which get a big transfer will jump in rank.

In general it takes time to gain (or lose) in rank and it is natural that we observe more mobility for longer time periods. The ergodic property of the transition matrices implies that the mobility processes move in the direction to give people equal chances independently of whether they start out poor or wealthy. If mobility is not too exaggerated because of measurement errors in the wealth estimates, one interpretation of this result is that the chance component is so large in the wealth lottery that it dominates life-cycle related changes. It is also interesting to note that mobility does not much influence the cross-sectional inequality of wealth.

A more general conclusion from this study is that in future research about wealth accumulation we cannot be satisfied by just analyzing mean or median behavior. Poor and rich behave very differently and most likely we will find different explanations to changes in different parts of the wealth distribution. Mobility is poorly understood and we need both to learn more about the measures we already have and take additional steps in the direction of causal modeling. Last but not least, improved data are very high on the priority list. If we could learn more about the nature of measurement errors in wealth data and have them under better control, much could be gained. For instance, this could help in assessing how much measurement errors inflate our current mobility measures. There is also much work to be done in capturing the wealth of the self-employed and the very rich, including the share that originates from bequests.

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