Who reaches the top?
Wealth mobility over the life cycle*

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Abstract

Who becomes wealthy? Who stays wealthy? And who will always remain poor? This paper presents empirical estimates of dynamic household movements into and out of the top percents of the wealth distribution over individual life cycles. The opportunities to accumulate wealth create incentives for education, work effort, and entrepreneurship. We would expect considerable wealth mobility if these incentives are strong and affect behavior. The data are from an administrative Swedish source that retains wealth information from tax registers. The data are unique, they follow a large sample of households over almost 40 years. There is substantial mobility when we follow individual households over long enough time spans. We find that wealth mobility increased until the end of the 1980s and then started to decrease.

Keywords: intragenerational wealth mobility, wealth spells, wealth durations, life cycle model, panel data

EconLit subject descriptors: D140, D310, D910, H240

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1 Introduction

Who becomes wealthy? Who stays wealthy? And who will always remain poor? The opportunities to accumulate wealth create incentives for education, work effort, and entrepreneurship. We would expect considerable wealth mobility if these incentives are strong and affect behavior.

We study movements of individuals and households in the wealth distribution over time and, therefore, as they age. As people differ in many respects, we would also expect to see considerable heterogeneity in wealth trajectories. The data available allow us to track households' wealth transitions over most of their working lives. This makes our data unique. Those getting rich not only increase their wealth over time in an absolute sense, but they also move through the wealth distribution and improve their position in the wealth ranking. Wealth distributions are highly skewed. For instance, the top percent of households owns about one third of private net worth in the US. This fact makes it necessary to capture the top percentiles in a reliable way. It is a strength that the data we use meet this requirement.

The degree of intragenerational wealth mobility is important when discussing different economic issues. First, wealth accumulation is the result of *choices* concerning labor supply, consumption, and savings. Life-cycle models predict that individuals will accumulate wealth while working and then decumulate when retired. One set of issues concern how well the life-cycle model predicts the actual age-wealth profiles and if these profiles differ between individuals. Another issue is if controlling for other determinants of wealth reduces the observed heterogeneity in age-wealth profiles. While we can, in principle, control for education, other important determinants of wealth accumulation such as entrepreneurial ability, are inherently unobservable.

Second, wealth mobility reflects the extent to which there is *equality of opportunity* a society. If there is equality of opportunity, the wealth of a young person will not be a good predictor of this person's wealth when middle aged. Suppose that entrepreneurship and risk taking sometimes for some yield considerable wealth increases. If wealth taxation reduces entrepreneurship and risk taking, we would then expect reduced wealth mobility. Wealth during different phases of the life cycle will be highly correlated if, on the other hand, inherited wealth is important. Inheritances are, however, very unequally distributed. This means that if inheritances are important for wealth then inheritances will be a source of heterogeneity.

1.1 Previous literature

The previous literature on intragenerational wealth mobility includes Hurst et al. (1998), Jianakoplos and Menchik (1997), Keister (2005), and Steckel and Krishnan (2006) who all study wealth mobility in the US. Jappelli and Pistaferri (2000) study wealth mobility in Italy. Klevmarken et al. (2003) and Klevmarken (2004) are among the previous papers on wealth mobility in Sweden.

These studies are based in wealth observations, in the time dimension, for

2–4 years. Wealth mobility is studied by comparing individual households' positions in the wealth distribution, in most cases, 5–7 years apart. Sometimes the time span is down to 2 years, sometimes up to 10–15 years apart. The sample sizes are quite small, in the cross-section dimension there are observations for 1,000–5,000 households. Wealth mobility is defined as movements between quartiles, quintiles, or deciles in the wealth distribution.

Most studies find that the probabilities to stay poor and remain rich are comparatively high. Wealth mobility is predominantly high in the middle of the wealth distribution. The previous literature consists of single country studies. Klevmarken et al. (2003) is the only exception. This paper compares wealth mobility in the US and Sweden. Contrary to what many might have conjectured, Klevmarken et al. (2003) find that wealth mobility in Sweden is as high as in the US.

The previous literature is, however, limited by the small number of observations. In the time dimension, the few observations for specific individuals for different years can only account for very limited parts of the individual's life cycle. In the cross section dimension, the few observations of different individuals for a specific years means that observations can only be grouped into a few quantiles. This means that the measure of mobility becomes imprecise when mobility is defined as movements between quantiles. These limitations also reduce the possible choices of empirical methods to study mobility. In addition, the previous literature is based on survey data. Surveys tend not to do so well in covering the top percents of the wealth distribution.

1.2 Our contribution

We believe that we can deal with these shortcomings of the previous literature. The data available to us are from the LINDA data base, an administrative source from Statistics Sweden. This data base provides long individual time series, many individuals, and the top percents of the wealth distribution well documented. This enables us to improve considerably on the analysis of wealth mobility.

The LINDA data base includes 3 percent of the Swedish population and their household members. There are 300,000 households and 700,000 individuals in this data base. We can follow a considerable part of individual life cycles for many. There are close to 40 annual observations for some individuals.

The key variables we use are annual taxable net wealth at the individual level and at the household level from 1968 and onwards.[1] A main advantages with this data set is that for those who do pay taxes there are very precise wealth measurements available.[2] This means that our measure of wealth mobility is very closely related to whether or not the individual pays wealth taxes. Wealth mobility is interpreted as the movements in and out of the top percents of the wealth distribution

[1] Taxable wealth at the household level was also the actual tax base during the studied period.

[2] A disadvantage is that wealth information in the register data is only available for those whose taxable wealth exceeds the high tax exemption levels.

over time and, also, movements over time within the top percents. As an alternative we also use an absolute real wealth measure, movements across a real wealth threshold.

The very long individual time series allow us to study "individual wealth trajectories", at least for those who pay wealth taxes at some stage. Accounting for such detail on individual heterogeneity has, to our knowledge, not been done and not been possible before in this context.

Our main results are:

- We find considerable movements into and within the top percents in the wealth distribution. This is not quite consistent with previous results for Sweden presented by Klevmarken (2004), but he studies other segments of the wealth distribution than we do. The average duration in the top three percents of the wealth distribution is 6 years.
- We find age-wealth patterns consistent with the life cycle model when focusing on the cohort born during the 1940s The patterns are consistent in the sense that wealth first increases and then decreases. The peak in wealth, however, occurs when people are about 70 years old. This is some years into retirement and not at retirement.
- Wealth mobility has varied over time. Our estimations suggests that wealth mobility increased during the 1970s and 1980s. The peak in mobility coincides with the deregulation of the Swedish financial markets during the second half of the 1980s. Wealth mobility has decreased since then.

The rest of the paper is structured as follows: Section 2 presents our theoretical framework. In Section 3, we present the data and how the data set was constructed. Section 4 reports the empirical results; first, on wealth flows and wealth durations and, then, on wealth mobility and wealth stability. Section 6 concludes.

2 Theoretical framework

The objective of this section is to provide a theoretical framework for studying wealth and wealth accumulation. We will discuss the various determinants and sources of wealth (or its absence).

2.1 Determinants of wealth accumulation and wealth heterogeneity

Think of a young adult in her early or mid 20's. When starting out in working life she has been given some *initial conditions* provided by her parents. There are four main ways by which parents can make transfers to their children: First, there are biological transfers of natural talents and abilities (genes). Second, parents can also transfer financial and tangible property by *inter vivos* gifts and bequests. For our young adult these intergenerational transfers are probably expected rather

than already realized. Third, parents can contribute to the formal education and other human capital investments of the child. Finally, parents can provide 'social capital', for example, values, manners, and access to social networks.

Parents are different and transfers will differ. The transfers from parents will, therefore, create an *initial heterogeneity* among young adults entering working life. Family background will, in other words, be important for, among other things, wealth and wealth accumulation. We are here talking about conditions like parents' education, occupation, and marital status. Family size and family income and wealth are also important family background characteristics. Culture, religion, race, and ethnicity are also characteristics that have been mentioned in the literature.

Gender and country of birth are other characteristics that contribute to initial heterogeneity. It may also be important to which birth cohort the individual belongs. Birth cohorts differ in size, but things like the date of labor market entry may also differ between cohorts for exogenous reasons.

Given the initial conditions our young adult will make *choices* and continue to do so during her life. Her preferences–for example, her time preference rate and her risk attitude–will be important for her choices. One of the outcomes will have to do with the path of her working life. Important dimensions of this are hours of work, occupation, career path, and entrepreneurship.

Another decision is the consumption path over the life cycle. The optimal consumption path will not necessarily follow the income path. Life cycle saving in general and retirement saving in particular will follow from the choices made. The future savings of our young adult might also be affected if she wishes to leave a bequest or if she, because of uncertainty, saves for precautionary reasons.

This will, of course, result in wealth accumulation and decumulation over the life cycle. But wealth might also be affected by the investment behavior of the individual, for example, the portfolio composition. (The term financial literacy has been used in the literature.)

The time and age pattern of demographic choices will also affect wealth. Marital status, family size, and the number of children are important characteristics.

Our young adult might be lucky or unlucky during the course of life. Windfalls such as unexpected inheritances, lottery winnings, and gambling winnings will increase wealth, at least temporary.

But windfalls might affect many and not only specific individuals. Asset prices might move so that the wealth of many is affected simultaneously. This is one example of how *general economic conditions* might affect wealth. The taxation of wealth is another example. The differences between living in different geographical locations may also change over time.

With this sketch of the factors that might affect wealth and wealth accumulation, we will now turn to a more formal discussion of the individual's life cycle choices.

2.2 Optimal wealth accumulation

The objective of this subsection is to discuss the implications for wealth accumulation of the choices that the individual makes concerning consumption and savings.[3] The approach is to start by focusing on the modeling assumptions needed to have individuals making the same choices rather than different choices.

The homogenous case - age effects only. Suppose that there is no uncertainty. Individuals have the same length of life and no bequest motives. They meet the same constant rate of interest. Each household consists of a single individual. Utility is additively separable, the instantaneous utility function does not change over time, and the time preference is constant.

The individuals maximizes

$$U = \sum_{t=1}^{T^*} \frac{u(C_t)}{(1+\rho)^{t-1}}, \tag{1}$$

where U is utility, u is instantaneous utility with decreasing marginal utility, t is time, T^* is the length of life, C is consumption, and ρ is the time preference, by choosing a consumption path $C_t,\ t = 1,\ldots,T^*$ subject to the intertemporal budget constraint

$$\sum_{t=1}^{T^*} \frac{C_t}{(1+r)^{t-1}} = \sum_{t=1}^{R} \frac{E_t}{(1+r)^{t-1}} + W_0, \tag{2}$$

where r is the rate of interest, R is the retirement age, E is earnings, and W_0 is the value of initial wealth in the beginning of period 1. The left hand side is lifetime consumption C^L, the right hand side lifetime resource consisting of lifetime earnings E^L and initial wealth. Provided that $R < T^*$, there will be retirement saving so that the individual can consume as retired. Consumption will be smoothed over the life cycle.

Let us add the following assumptions: Suppose that the interest and time preference rates are zero, that initial wealth is zero, and that annual earnings are constant during the individual's working life. The individual will choose to consume a fixed share of lifetime earnings every year. This will result in piecewise linear age-wealth profile with increasing wealth until retirement, a wealth peak at retirement, and then decreasing wealth. The wealth of individual i will evolve according to

$$W_{it} = W_{it-1} + (1 - D_i^R)(\frac{1}{R_i} - \frac{1}{T_i^*})E_i^L - D_i^R \frac{1}{T_i^*} E_i^L, \tag{3}$$

where W is wealth and D_i^R is an indicator equal to one when individual i is retired and zero otherwise. The savings rate of a working individual is

$$s_{it} \equiv \frac{W_{it} - W_{it-1}}{E_i^L} = \frac{1}{R_i} - \frac{1}{T_i^*}. \tag{4}$$

[3] The discussion is inspired by Davies and Shorrocks (1999) and Dynan et al. (2004).

Suppose that individuals are identical except for age. During their working life individuals will move up in the wealth distribution both in absolute and relative sense, as retired individuals will move down.

The heterogenous case. It is an old question in the economics literature whether rich people save more than poor people. Dynan et al. (2004) discuss under which conditions savings rates are the same. Savings rates provide a link between income and wealth. Suppose that individuals have different lifetime earnings while there is no uncertainty and there are no bequest motives. With identical savings rates for a cohort j, the wealth of an individual belonging to the cohort will evolve according to

$$W_{ijt} = W_{ijt-1} + s_{jt}E^L_{ij}. \tag{5}$$

The cohort specific savings rate is s_{jt}. Consumption is proportional to lifetime earnings for the individual either if (i) the time preference rate is constant and equals the rate of interest or if (ii) preferences are homothetic. In the first case annual consumption will be same every year, in the second case annual consumption will grow at the same rate every year. In addition, suppose that preferences, length of life, and rates of interest are the same for all individuals. The ratio of consumption to lifetime earnings at time t is the same for all individuals belonging to cohort j. Finally, suppose that the relative differences between individuals in annual earnings are constant over time. The savings rate at time t will then, with these assumptions, be the same for all individuals belonging to cohort j. There will, in other words, be no cross section variation at time t for those of the same age. The savings rate might, on the other hand, vary over time (age) for a given cohort. During their working life individuals will move up in the wealth distribution both in absolute and relative sense. Those with higher lifetime earnings will move faster and end up with more wealth at retirement than those with lower lifetime earnings.

Relaxing any of these assumptions and instead introducing, for example, differences in preferences or earnings profiles, rates of interest, length of life, retirement age, or introducing uncertainty and bequest motives will result in less homogeneity across individuals in wealth accumulation.

3 Data

Our data are from the Longitudinal INdividual DAta base (LINDA), a data source collected and maintained by Statistics Sweden.[4] The source data are various administrative data bases from government agencies that keep records on any (registered) inhabitant in the country. For instance, data from the tax authorities, the social security administration, and from local municipalities. We have spent considerable energy in trying to get at coherent definitions of variables from an array of different variables for different years in the source data.

[4]Edin and Fredriksson (2000) presents the data base.

3.1 The samples

The data come in two sub-samples, that we refer to as *the P sample* (the panel sample) and *the F sample* (the family sample). For *the P sample*, the data were randomly drawn in 1994 with a sample size of 300,000 households, comprising almost 700,000 individuals. A household in the data set is a group of people treated as a taxable unit. For the vast majority of cases, this coincides with a residential household or a family.

The F sample is available to us from 1991 until 2005. The sampling unit here is a "family" that is, persons living at the same address according to the population register. Since there may be various sub-households within a "family" that are treated as separate taxable units, and since members of the same tax households may live at different addresses, it may be that the definitions of "households" in the P sample and of "family" in the F sample do not coincide. On average, a "family" is slightly larger than a "household".[5]

The administrative nature of the data implies that there is no panel data attrition as is known from survey data. Theoretically, a person can leave the sample by emigration or death (and only in a few cases where records could not be traced in the source data bases). Persons enter by birth or by, say, marrying into an existing unit.

3.2 The wealth variable

The dependent variable we use is annual taxable net wealth at the household level. The tax base was a comprehensive measure of household net wealth (including real assets and financial assets minus debts). Taxable wealth did, however, not include pension wealth in the sense that the value of future public and occupational pensions were not included neither were savings in tax deferred pension savings accounts. Wealth taxation was affected by tax evasion and tax avoidance. Tax compliance was, however, high for assets for which there was third party reporting. Appendix B reports more details about the Swedish wealth tax. The Tax Agency only kept the wealth information for those having to pay the wealth tax.

Table 1 reports the percentage share of wealth tax paying households in Sweden 1968–2005. It is clear that we have information for the five top percent for most years, but complete data for the whole period are only available for the top three percent. The design of the system for taxing wealth has varied during the period, for instance concerning tax rates and exemption levels. Many more house-

[5]Table A.1 in Appendix A fills in on the relative differences. It shows that the number of households virtually equals the number of families in any year of overlap, but that, on average, families are about 15 percent larger than tax households. Since in two thirds of all cases the same individuals form both a household and a family in any given year, and close to 99 percent of all individuals that are in the household data are also in the family data, we aim to combine both data sets and work, in what follows, with the smaller definition of tax households. One large difference between the series occurs at the point in time when children of age 18 and above earn their own incomes and own their own wealth and are thus separately from their parental household liable to tax.

Table 1: Percentage of households paying wealth tax, 1968–2005

year	tax payer	year	tax payer	year	tax payer	year	tax payer
1968	6.16	1978	5.10	1988	9.81	1998	8.24
1969	6.42	1979	5.37	1989	10.73	1999	9.45
1970	4.13	1980	5.97	1990	4.37	2000	9.10
1971	5.10	1981	4.44	1991	5.09	2001	6.24
1972	5.49	1982	5.02	1992	5.84	2002	3.49
1973	5.81	1983	10.36	1993	6.82	2003	4.29
1974	3.52	1984	6.04	1994	5.54	2004	4.42
1975	5.56	1985	6.94	1995	5.93	2005	2.99
1976	5.85	1986	8.59	1996	6.46		
1977	6.04	1987	8.44	1997	7.78		
					share ever paying wealth tax, 1968–2005		11.71
					share ever paying wealth tax, those observed every year 1968–2005		33.57

Source: Linda.

holds paid wealth taxes during the 1980s and the second half of the 1990s. Almost 16 percent of the households paid the wealth tax at least once during the period. More than a third of the households that we can continuously observe 1968–2005 paid wealth taxes some time during the period.

3.3 The control variables

The set of control variables we have at our disposal from LINDA is quite limited, but we do have important demographics for the household head: The time invariant variables are year of birth, place of birth, gender, and education. We also have access to the marital status of the household head (time varying). We know the household size, the number of children and their ages (time varying). The employment income of the household is also known to us.[6]

We also include a number of macro variables from other sources: real GDP, a stock market index, regional house price indices, and regional tax assessed values of single family houses.

Finally, we include some aspects of the design of the wealth tax: the lowest and the highest marginal wealth tax rates, the exemption level in real value, and the fraction of working capital in small businesses that was exempt from taxation.

[6]Employment income includes salaries and, since 1974, social insurance system benefits (such as sickness benefits and parental benefits), and unemployment benefits. Approved costs for commuting to work are subtracted. Employment income also includes public pensions and occupational pensions.

4 Results

4.1 Wealth shares

Paying wealth tax or not is one of the possible distinctions between states that can be made for these data. Another possible distinction is between different percentiles of the wealth distribution. As mentioned above, there is only complete information over time for the *top three percent* of the wealth distribution. We will use the distinction between belonging to the top three percent or not. We can also study the flows in to and out the top three percent (across the 97th percentile, P97) and the flows within the top three percent (across P98 and P99). Almost 6 percent of the households belonged to the top three percent at least once during the period. Slightly more than 17 percent of the households that we can continuously observe 1968–2005 belonged to the top three percent some time during the period.

We can also compute an absolute real measure instead of this relative measure. This will give a related but different distinction. The highest real exemption level, defined as the nominal exemption level in relation to nominal GDP per capita, during the period was the one in 1970. The real value was $\approx \text{SEK}_{2010}$ 1.5 million. This corresponds to EUR 160,000 and USD 210,000.

We have information on all fortunes above this real wealth threshold during the whole period. We will use the metaphor *millionaires* to refer to the households above this threshold. The flows of becoming a millionaire and stopping being one can also be studied. Slightly more than 6 percent of the households was a millionaire at least once during the period. Almost 18 percent of the households that we can continuously observe 1968–2005 was a millionaire some time during the period.

Figure 1 reports how the share of millionaires has evolved during the period. The share of household above the real wealth threshold that we have imposed showed a decreasing trend until 1980. Since then the trend has been reversed, an increasing share of the households is above the real wealth threshold. The figure also shows the share paying wealth tax.

There are three types of changes in the wealth tax design that have affected assessed wealth considerably:

a. Major reassessments of single family houses' tax values is the first type of change. These assessments were not made every year. This meant that the assessed values considerable when the assessments were made as house prices increased continuously. Political pressure often resulted in that politicians responded by increasing wealth tax exemption level. There were major reassessments in 1970, 1975, 1981, 1990, 1996, and 2001.

b. Changes in the fraction of wealth in small businesses (working capital) that was tax exempted is the second type of change. All small business wealth was in included in the tax base in the beginning of the studied period. Strong pressure groups succeeded in step by step increasing the fraction that was

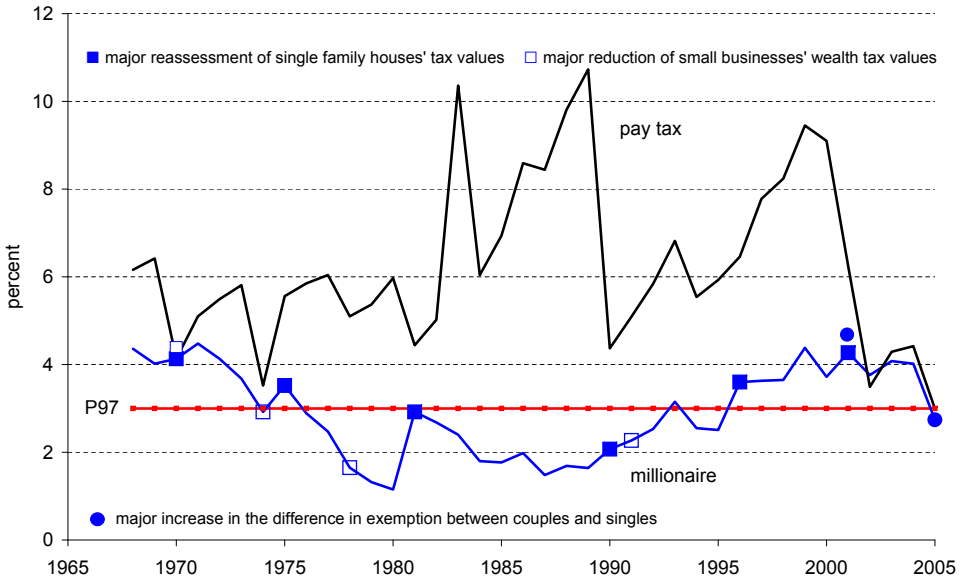

Figure 1: Shares being millionaires and paying wealth tax, 1968–2005, percent

wealth tax exempt. Small business wealth was completely exempt from wealth taxation from 1991. Before this, reductions were made in 1970, 1974, and 1978.

c. The number of household members did not matter for wealth taxation until 2001, only total household wealth mattered. Couples got a higher exemption than singles from 2001. The difference in exemption increased considerably in 2005. Increases in this exemption difference affects the composition of singles and couples in our sample Many couples no longer had to pay the wealth tax as their exemption increased, whereas singles with the same wealth still had to pay the tax.

4.2 Wealth flows and wealth durations

Table 2 reports transitions during the period 1968–2005. The left hand panel shows flows into and out of the top three percent of the distribution. The right hand panel reports transitions to wealth above the real wealth threshold and transitions in the reverse direction. From now on, we study transitions between two discrete states: being in the top three percent (state 1), and not being in the top percent (state 0). Alternatively, we consider being or not being a millionaire.

There is some variation over time in the inflow rates to the top three percent. This might be attributable to macroeconomic shocks and asset price changes, for instance. Most years the inflow rate is around 0.5 percent while outflow rates are in the range 15–20 percent. Obviously, inflow and outflow rates are by definition highly correlated in this case as the share is fixed to three percent. The years in which the the major changes in the wealth tax design occurred are in bold. Flows are, in general, higher than otherwise these years.

Mobility is closely related to duration, high mobility implies short duration. The average outflow rate from the top three percent of 16.64 suggests an average duration in the top three percent of 6.01 years. Average duration is often referred to as mean exit time (MET) in the mobility literature. The average outflow and inflow rates together suggest a top three equilibrium share of 3.54 percent. These flow rates, therefore, are not at a long run equilibrium.

Turning to the second distinction, there is more variation in the inflow into being a millionaire than the inflow to the top three percent. This inflow rate is in the range 0.2–1.5 percent while the outflow rate is in the range 10–30 percent.

The average outflow rate from being a millionaire of 18.05 suggests an average duration as millionaire of 5.54 years. The average outflow and inflow rates together imply a long run millionaire share of 3.22 percent. The actual average millionaire share is about the same. Flows are also in this case, in general, higher than otherwise these years.

Starting from a life cycle model perspective, we would expect it to be more likely to observe people above the cutoffs when they are in their 50s and 60s and until they retire. Transitions in to the top three percent or in to becoming a million-

Table 2: Transitions over time, 1968–2005

	the top three percent		millionaire	
between	inflow, percent	outflow, percent	inflow, percent	outflow, percent
annual 1968–2005	0.61	16.64	0.60	18.05
1968–1969	0.49	11.09	0.51	14.65
1969–1970	**0.83**[a]	**13.89**[b]	**1.22**[a]	**12.82**[b]
1970–1971	0.30	16.72	0.56	12.19
1971–1972	0.37	9.06	0.38	13.63
1972–1973	0.40	9.92	0.32	15.67
1973–1974	0.49	**12.80**[b]	0.23	**24.30**[b]
1974–1975	**0.70**[a]	18.89	**1.09**[a]	10.93
1975–1976	0.46	11.45	0.25	22.43
1976–1977	0.48	12.44	0.24	20.10
1977–1978	0.87	**25.25**[b]	0.22	**40.21**[b]
1978–1979	0.58	15.60	0.16	27.18
1979–1980	0.59	15.79	0.18	23.80
1980–1981	**1.06**[a]	31.16	**1.97**[a]	6.72
1981–1982	0.54	14.58	0.40	19.19
1982–1983	0.55	15.27	0.36	21.35
1983–1984	0.53	13.44	0.17	29.29
1984–1985	0.53	13.33	0.32	15.15
1985–1986	0.61	16.54	0.51	12.93
1986–1987	0.66	18.39	0.20	33.77
1987–1988	0.66	18.21	0.50	15.70
1988–1989	0.60	16.28	0.34	19.10
1989–1990	**0.99**[a]	29.03	**0.83**[a]	20.23
1990–1991	0.58	**25.54**[b]	0.51	**22.06**[b]
1991–1992	0.66	18.34	0.71	15.32
1992–1993	0.57	15.21	0.96	8.29
1993–1994	0.78	20.74	0.43	28.85
1994–1995	0.51	14.04	0.42	15.27
1995–1996	**0.64**[a]	16.80	**1.45**[a]	7.15
1996–1997	0.55	14.87	0.70	15.14
1997–1998	0.42	11.47	0.53	11.05
1998–1999	0.57	15.33	1.19	7.76
1999–2000	0.47	11.87	0.35	19.69
2000–2001	**0.63**[a]	**18.40**[c]	**1.14**[a]	**11.94**[c]
2001–2002	0.64	17.97	0.55	22.16
2002–2003	0.50	13.99	0.86	10.85
2003–2004	0.42	11.10	0.52	11.34
2004–2005	0.83	**24.70**[c]	0.31	**37.99**[c]

Notes: [a] major reassessment of single family houses' tax values,
[b] major reduction of small businesses' wealth tax values,
[c] major increase in the difference in exemption between couples and singles.

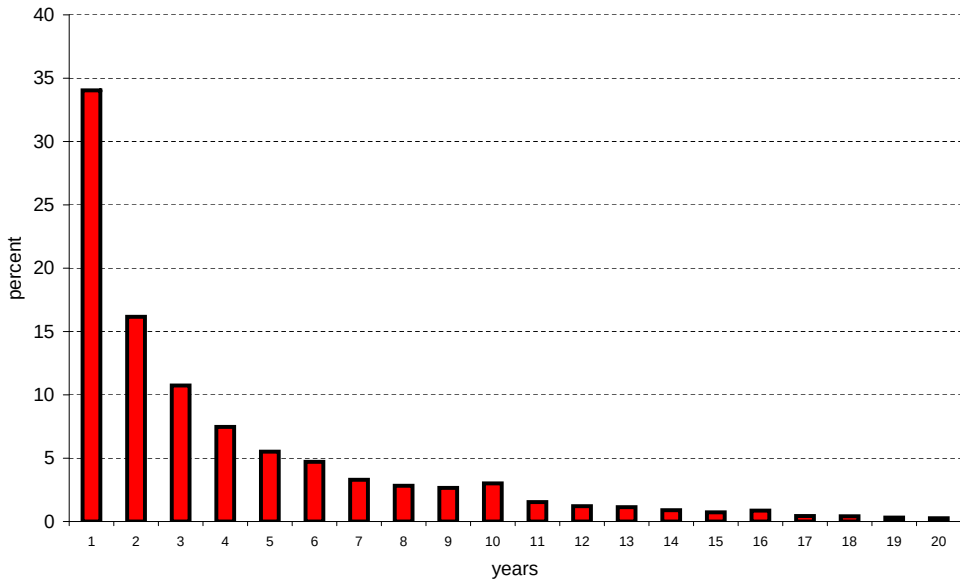

Figure 2: Frequency distribution of millionaire spells, percent

aire would then be more likely when people accumulate wealth, while transitions in the other direction would be more likely when people have retired.

While Table 2 is illustrative on average transition probabilities it masks heterogeneity in wealth transitions. Our data give long uninterrupted accounts of wealth status. There are 673,912 households for which we at least have non-missing observations for at least two adjacent years. Of these, 93.4 percent were never millionaires, while 6.0 percent were millionaires some of the years observed but not all. A small fraction of the households, 0.6 percent, were millionaires all years observed.

Figure 2 shows the frequency distribution of the time spells as millionaires. Most spells are short, half of the spells are shorter than 3 years. The number of longer millionaire spells is very low.

We can also calculate the total number of years as millionaires. Households always being millionaires have a fraction of 12.45 percent of the total number of millionaire years. The rest of the millionaire years, 87.55 percent, are for households sometimes millionaires. We know that a household in this group at least once become millionaire or stops being one.

Figure 3 reports the frequency distribution of millionaire years for different millionaire spell lengths. Almost half the millionaires years are for households with millionaire spell lengths shorter than eight years. It is also clear from the figure that the contributions of always millionaire households are very small. The exception is for the millionaire spell length of 38 years where all households by definition always are wealthy.

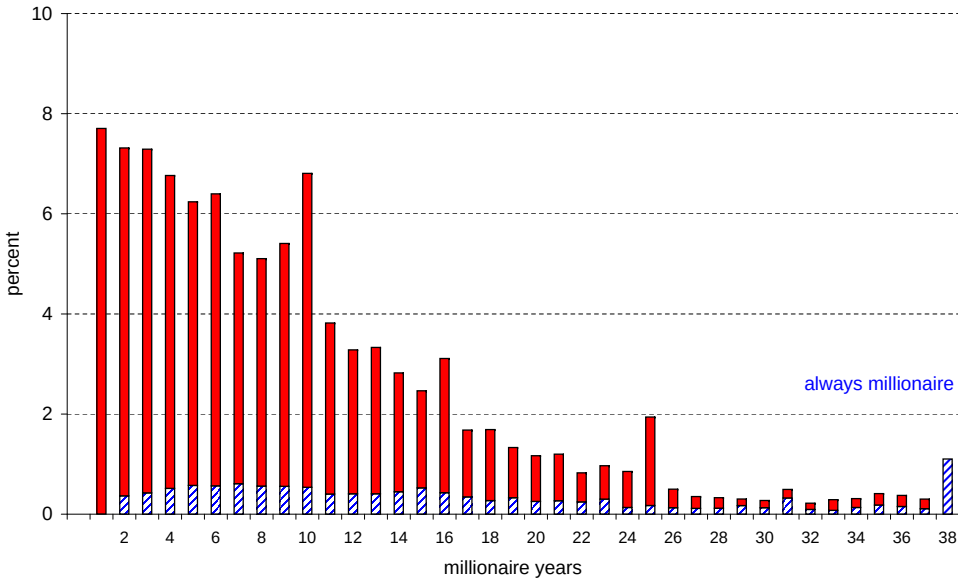

Figure 3: Frequency distribution of millionaire years, percent

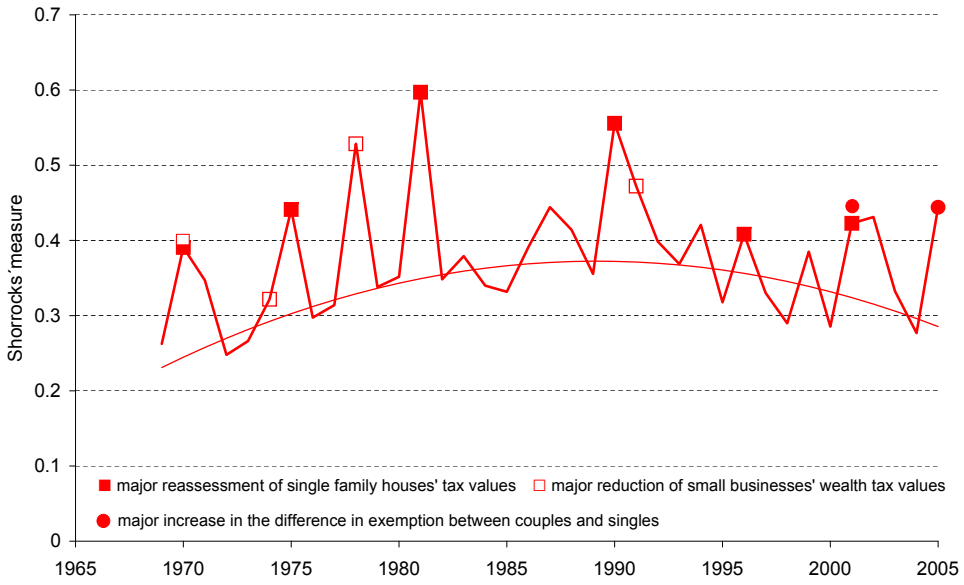

Figure 4: Wealth mobility, 1968–2005, Shorrocks' measure

4.3 Wealth mobility and wealth stability

An often used summary measure in the previous literature on wealth mobility is the Shorrocks' measure of mobility, see Shorrocks (1978).[7] It is defined as

$$S = \frac{N - \mathrm{tr}(P)}{N - 1} \tag{6}$$

where N is the number of groups and $\mathrm{tr}(P)$ is the trace of the $N * N$ transition matrix P. The range of S is $[0, N/(N-1)]$. A higher S indicates a higher degree of mobility.

In our case, we can study four groups, each of the three top percent and those below P97 taken together. Using the average transitions rates of our data, the Shorrocks' measure is 0.386. This cannot, however, be compared to previous measures of wealth mobility in Sweden as we here only measure mobility for the top three percents. The strength of our data is many observations for each household. We can, therefore, calculate a time series for annual wealth mobility for almost 40 years using the Shorrocks' measure.

Figure 4 shows how wealth mobility has evolved during the studied period. The annual Shorrocks' measures vary considerably. The huge spikes in the Shorrocks' measures coincide with the major changes in the wealth tax design.

We have estimated a descriptive regression controlling for the major changes in the wealth tax design.[8] We also include trend polynomials as regressors. The

[7] Some refer to the measure as Shorrocks' MET as it is a function of mean exit time from a group.

[8] Table A.2, column 1, in Appendix A reports the results.

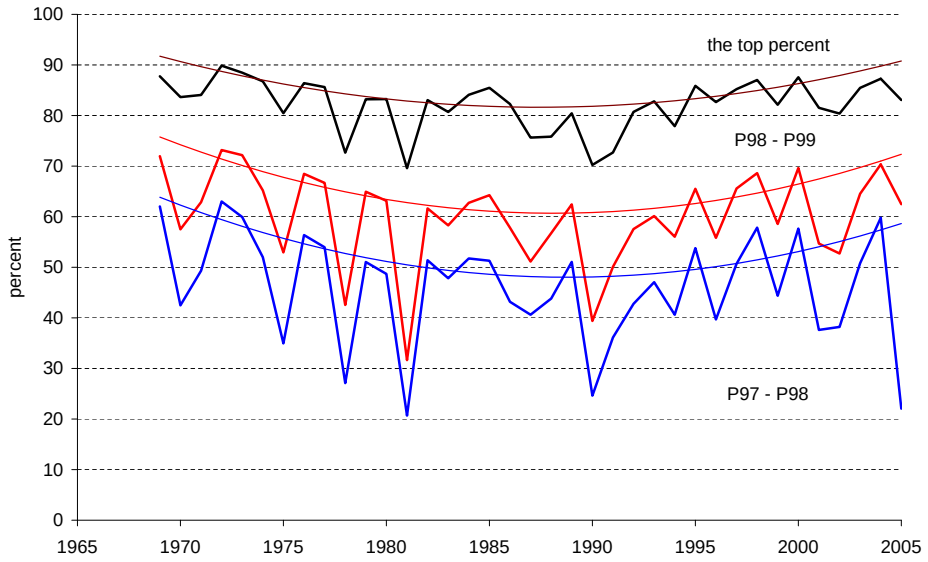

Figure 5: Wealth stability, 1968–2005, percent

estimated trend line in the figure suggests that wealth mobility increased during the 1970s and 1980s. The peak in mobility coincides with the deregulation of the Swedish financial markets during the second half of the 1980s. Wealth mobility has decreased since then.

It is also possible to study wealth stability over time. Figure 5 shows the shares of household in the top three percent, respectively, that have stayed in between the percentiles where they were in the previous year. About 80–90 percent of the households in the top percent remained there the following year. The corresponding number for the next percent is lower. About 60–70 percent of the households between P98 and P99 remained there the following year. Stability is even lower if we turn to the next percent. The share remaining is 50–60 percent for the households between P97 and P98.

We have estimated descriptive regression with the three wealth stability measure as dependent variables. We include trend polynomials as regressors and control for the major changes in the wealth tax design.[9] The estimated trend lines confirm the findings in Figure 4. Wealth stability decreased during the 1970s and 1980s. From the end of the 1980s wealth stability has increased.

These descriptives tell a story about the movements in the top percents of the Swedish wealth distribution during the period 1968–2005. But we have far from used all the possibilities that our panel data offer. This will be the objective of the following section.

[9]Table A.2, columns 2–4, in Appendix A reports the results.

5 Estimations

This section reports estimations of probability models for being a millionaire and belonging to the top three percent. The estimated models are of two types. The first type is fixed effect probit models. We include households that at least one has been a millionaire (belonged to the top three percent). The sample is also conditioned on the household having observations for 30 years or more.

The second type is random effects probit models. The sample also here only includes households that have been wealthy at least one years and are observed at least 30 years. We, furthermore, condition on time averages of regressors as additional covariates. Mundlak (1978) has shown the equivalence of random and fixed-effects linear models when this conditioning is done in random effects models.

The first subsection reports the results when we include all households. It is, however, not clear-cut to separate age effects from cohort effects. We, therefore, also report estimations results when we limit the sample to those born during the 1940s.

5.1 All households

Table 3 reports the estimation results for being a millionaire. It is very clear that being two adults in the household, rather than one, directly and indirectly increases the probability of being a millionaire. The estimated marital status indicators support this. So does also the estimated effect of household size while the number of minor children decreases the probability. Household employment income also has an estimated positive impact.

The estimated positive impact of being a lone parent is, however, somewhat difficult to interpret and contrary to what one would expect. Another surprising result is the estimated negative impact of (regional) house prices. The estimated effects of the other macro variables are more expected.

The estimated house price effect might, however be affected by the inclusion of (regional) tax assessed house values. The latter variable has the expected positive impact on the probability of being a millionaire. The other wealth tax variables also have expected estimated effects. The exception is the impact of the exemption.

The estimated age effects are also statistically significant. As is clear from Figure 6, however, the estimated age-wealth profiles are increasing over almost the whole age range. The estimated maximum impact is for the age of 85.

The random effects estimation results in the second column reveal households headed by men are less likely to be millionaires. The estimated effect is, however, only statistically significant at the 10 percent level. Moreover, only one of the education indicators produce statistically significant result.

Time invariant regressors will, for obvious reasons, drop out of the fixed effects specification and be absorbed by the estimated fixed effects. The estimated fixed effects capture heterogeneity. We will now turn to the correlates of our mea-

Table 3: Probit models for being a millionaire

	fixed effects	random effects
age variables:		
age, years	0.264***	0.248***
age^2/10	-0.013***	-0.011***
age^3/100	-0.0002***	-0.0002***
marital status, indicators:		
cohabiting	-0.478***	-0.444***
widow(er)	-1.004***	-0.954***
divorced	-0.615***	-0.598***
single	-0.950***	-0.910***
lone parent	0.708***	0.679***
household variables:		
number of children 6 or younger	-0.067**	-0.065**
number of children 7–12	-0.129***	-0.124***
number of children 13–17	-0.151***	-0.145***
household size	0.084***	0.077***
age $\times$ number of children	0.006***	0.006***
employment income, log	0.177***	0.170***
macro variables:		
real GDP growth, percent	0.025***	0.024***
stock market index, percentage change	0.250***	0.240***
regional house price indices, percentage changes	-0.339***	-0.329***
wealth tax variables:		
bottom marginal tax rate	-0.693***	-0.666***
top marginal tax rate	-0.045***	-0.044***
exemption	0.728***	0.702***
regional tax assessed house values, percentage changes	0.849***	0.814***
tax exempt small businesses wealth, share	-2.513***	-2.422***
2005, indicator	-0.329***	-0.320***
2005, indicator $\times$ number of adults	-0.314***	-0.302***
year variable:		
post 1990, indicator	0.881***	0.847***
time invariant variables:		
male, indicator		-0.039*
primary education, indicator		-0.105***
upper secondary education, indicator		-0.018
short tertiary education, indicator		-0.099
long tertiary education, indicator		0.022
post graduate education, indicator		0.072
other and missing education, indicator		-0.001
place of birth, indicators		yes
year of birth, indicators		yes
n of observations	497,787	497,787
n of households	14,074	14,074
log likelihood	-172,208	-195,560

Notes. *, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively.
Reference categories: married and lower secondary education.
The random effects specification also includes all regressors averages for time varying variables.

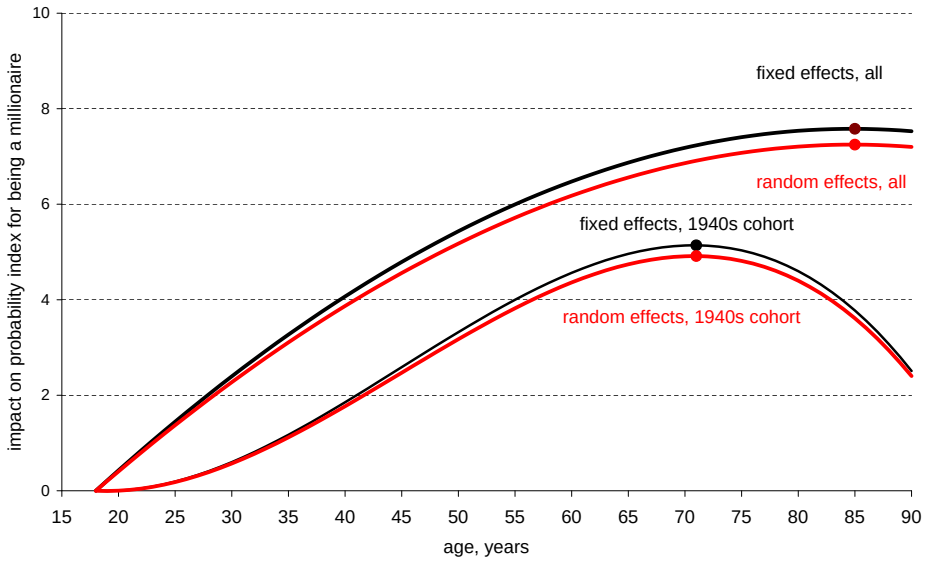

Figure 6: Estimated age-wealth profiles

sured heterogeneity. We regress the estimated individual fixed effects on the time invariant regressors. We use time-averaged values of the other regressors. The estimations reported in Table 4 asks the questions what the correlates of the fixed effects are.

It is clear from the table that ....

The results for the top three percent will be added later.

Table 4: Correlates with fixed effects, millionaires

age, years, average	-0.047***	-0.046***
marital status, indicators, averages:		
cohabiting	0.253	0.238
widow(er)	1.159***	1.163***
divorced	0.670***	0.673***
single	1.575***	1.580***
lone parent	-0.754***	-0.770***
household variables, averages:		
number of children 6 or younger	-0.405**	-0.397**
number of children 7–12	-0.085	-0.102
number of children 13–17	-0.670***	-0.684***
household size	0.243***	0.228***
age × number of children	-0.003	-0.002
employment income, log, average	0.884***	0.981***
income uncertainty		
permanent		0.000135
temporary		-0.000169*
macro variables, averages:		
real GDP growth, percent	0.184	0.180
stock market index, percentage change	-1.500	-1.498
regional house price indices, percentage changes	-0.255	0.082
wealth tax variables, averages:		
bottom marginal tax rate	-0.090	0.354
top marginal tax rate	-1.068	-1.067
exemption	2.293	2.824
regional tax assessed house values, percentage changes	-2.943**	-2.821**
tax exempt small businesses wealth, share	5.878**	5.746**
2005, indicator	-0.107	-0.686
2005, indicator × number of adults	-0.395	-0.409
year variable, average:		
post 1990, indicator	4.944**	-5.191**
time invariant variables:		
male, indicator	-0.037*	-0.043**
primary education, indicator	-0.155***	
upper secondary education, indicator	-0.064*	
short tertiary education, indicator	-0.162**	
long tertiary education, indicator	-0.030	
post graduate education, indicator	-0.010	
other and missing education, indicator	-0.049	
place of birth, indicators	yes	yes
year of birth, indicators	yes	yes
n of households/observations	14,074	14,074
R^2	0.348	0.346
adj R^2	0.345	0.343

Notes. *, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively.

5.2 The cohort born during the 1940s

Table 5 reports the estimation results for the cohort born during the 1940s of being a millionaire. Most estimated effects do not differ qualitatively from those reported in Table 3. There are, however, some important exceptions to this. The estimated effect of household size is no longer statistically significant here.

The estimated age effects are also statistically significant here. The estimated coefficients, however, imply different age-wealth profiles compared to those when all cohorts are included. We find age-wealth patterns consistent with the life cycle model when focusing on the cohort born during the 1940s The patterns are consistent in the sense that wealth first increases and then decreases as is clear from Figure 6. The peak in wealth, however, occurs when people are 71 years old. This is some years into retirement and not at the most common retirement ages.

The results for the top three percent will be added later.

Table 5: Probit models for being a millionaire, the 1940s cohort

	fixed effects	random effects
age variables:		
age, years	-0.296***	-0.283***
age^2/10	0.099***	0.095***
age^3/100	-0.007***	-0.007***
marital status, indicators:		
cohabiting	-0.255**	-0.247**
widow(er)	-1.026***	-0.962***
divorced	-0.192*	-0.169*
single	-1.070***	-1.015***
lone parent	0.470***	0.441***
household variables:		
number of children 6 or younger	0.168**	0.164***
number of children 7–12	0.184**	0.178**
number of children 13–17	0.184**	0.176**
household size	0.006	0.002
age × number of children	0.000	0.006
employment income, log	0.782***	0.721***
macro variables:		
real GDP growth, percent	0.007	0.007
stock market index, percentage change	0.224***	0.212***
regional house price indices, percentage changes	-0.800***	-0.769***
wealth tax variables:		
bottom marginal tax rate	-0.577***	-0.550***
top marginal tax rate	-0.024	-0.023
exemption	0.646***	0.622***
regional tax assessed house values, percentage changes	0.719***	0.683***
tax exempt small businesses wealth, share	-2.019***	-1.920***
2005, indicator	-0.230**	-0.230***
2005, indicator × number of adults	-0.329***	-0.314***
year variable:		
post 1990, indicator	0.406***	0.384***
time invariant variables:		
male, indicator		-0.043
primary education, indicator		-0.217***
upper secondary education, indicator		-0.129*
short tertiary education, indicator		-0.264**
long tertiary education, indicator		-0.096
post graduate education, indicator		-0.005
other and missing education, indicator		-0.318
place of birth, indicators		yes
year of birth, indicators		yes
n of observations	110,553	110,553
n of households	3,186	3,186
log likelihood	-30,547	-30,570

Notes. *, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively.
Reference categories: married and lower secondary education.
The random effects specification also includes as regressors averages for time varying variables.

Table 6: Correlates with fixed effects, millionaires, the 1940s cohort

age, years, average	0.466	0.476
marital status, indicators, averages:		
cohabiting	0.065	0.043
widow(er)	1.686***	1.678***
divorced	0.322	0.327
single	1.373***	1.410***
lone parent	-1.020**	-1.026***
household variables, averages:		
number of children 6 or younger	-0.717	-0.696
number of children 7–12	-0.035	-0.158
number of children 13–17	-2.318**	-2.387**
household size	0.453***	0.444***
age × number of children	0.005	0.006
employment income, log, average	-0.161	-0.071
income uncertainty		
permanent		0.0003*
temporary		0.0004
macro variables, averages:		
real GDP growth, percent	0.193	0.203
stock market index, percentage change	1.384	1.337
regional house price indices, percentage changes	-4.260	-3.970
wealth tax variables, averages:		
bottom marginal tax rate	-22.3**	-22.1**
top marginal tax rate	-3.445	-3.581
exemption	-9.452	-9.516
regional tax assessed house values, percentage changes	-1.349	-1.345
tax exempt small businesses wealth, share	-0.670	-1.079
2005, indicator	9.606	9.483
2005, indicator × number of adults	0.035	-0.111
year variable, average:		
post 1990, indicator	2.864	3.015
time invariant variables:		
male, indicator	-0.042	
primary education, indicator	-0.229**	
upper secondary education, indicator	-0.190**	
short tertiary education, indicator	-0.277**	
long tertiary education, indicator	-0.119	
post graduate education, indicator	-0.056	
other and missing education, indicator	-0.351	
place of birth, indicators	yes	yes
year of birth, indicators	yes	yes
n of households/observations	3,186	3,186
R^2	0.180	0.178
adj R^2	0.168	0.167

Notes. *, **, and *** denote statistical significance at the 10, 5, and 1 percent level, respectively.

6 Conclusions

With increasing availability of suitable micro data, the recent economic literature has seen a surge in interest in studying distributional issues and implications of top incomes over the past few years. In addition, there is some revived interest in studies on wealth mobility.

We add to this literature the aspect of studying individual wealth mobility over the entire working life cycle, exploiting long individual time series of household wealth. We use a large administrative sample from Sweden. The period under study covers the years 1968–2005. We can track many households that are continuously in the sample.

The wealth data are heavily censored from below, owing to the fact that their values originate from wealth tax registers. The wealth tax in Sweden (repealed from 2007) was associated with relatively high exemption levels. This leaves only a small fraction (between 3.4 and 13.1 percent) of households observed with wealth in any one cross section. However, we capture the top of the wealth distribution. This is very important for determining macroeconomic aggregates. From a life cycle point of view, there is actually a large fraction of households (34 percent) that ever pay wealth taxes at some point during their life cycles if we condition on those that are in the sample every year from 1968 to 2005.

Whereas the wealth information available in the tax data is restricted, we can shed new light on the study of wealth mobility at the individual level. Due to heavy censoring, we confine ourselves to looking at changes over time in binary indicators. We, therefore, study movements in and out of the top three percent of the wealth distribution and across an absolute wealth threshold that we refer to as millionaires.

Our main results are:

- We find considerable movements into and within the top percents in the wealth distribution. This is not quite consistent with previous results for Sweden presented by Klevmarken (2004), but he studies other segments of the wealth distribution than we do. The average duration in the top three percents of the wealth distribution is 6 years.

- We find age-wealth patterns consistent with the life cycle model when focusing on the cohort born during the 1940s The patterns are consistent in the sense that wealth first increases and then decreases. The peak in wealth, however, occurs when people are about 70 years old. This is some years into retirement and not at retirement.

- Wealth mobility has varied over time. Our estimations suggests that wealth mobility increased during the 1970s and 1980s. The peak in mobility coincides with the deregulation of the Swedish financial markets during the second half of the 1980s. Wealth mobility has decreased since then.

We are presently working on a parallel paper focusing on dynamic specifications. This raises several econometric challenges. We estimate dynamic binary models that allow for estimating parameters of individual wealth dynamics. In this other paper we start by presenting evidence based on AR(1) processes.

There are two principal ways of modeling individual unobserved effects, as a fixed effects and as a random effects. In a fixed effects setting, the inclusion of individual dummy variables in maximum likelihood estimation has been viewed as causing an incidental parameter problem (Neyman and Scott, 1948). The main issue is that parameter estimates of coefficients of explanatory variables that are being jointly estimated with the fixed effects need not be consistent when T is fixed. For a random effects approach, the specification will need to include additional distributional parameters that have to be estimated.

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Appendix A Additional tables and figures

The P sample - tax households. The data were randomly drawn in 1994 with a sample size of 300,000 households, comprising almost 700,000 individuals. A household in the data set is a group of people treated as a taxable unit. For the vast majority of cases, this coincides with a residential household or a family.

All members of these 1994 households were then followed through time, backwards until 1968, and assigned the same household number as the 1994 one if they were members of that same tax household in the respective year. For those members who joined the 1994 households in other years, a different household number was assigned before joining. The data also tracks those joining members through time when they are not member of a 1994 household. Likewise, the data were extended beyond 1994 until 1999, using a similar sampling scheme. This implies that the change in the number of households and individuals is closely following the development of the entire residential population in the country for the period 1968 through 1999.

The F sample - population register families. (to be written)

Following individuals over a time span of nearly 40 years inevitably implies that they live in different households of different composition at different stages of their life cycle. For instance, an individual might be born in household number 1, then complete school and start working and be separately taxable, so be assigned to household number 2, then marry, have children on their own, and subsequently divorce, upon which again a new household number 3 is assigned. The implication is that there are many 'households' that are linked on an individual level since the same person is in household 1 in one year and in household 2 or 3 in another year.

We aim to remove split-off households. For this, we first create a new super-household identifier that groups all individuals that ever were in a household that shared at least one member in anyone year. Within such a super-household, we select that household that ranks highest in average size and participation within the P sample. We call this the core household.

For the F sample we create artificial units from the recorded families by tracing the existing and joining members of a 1999 core household that share a family identifier. We refer to these also as core households. We only consider core households.

Table A.1: Total sample sizes, by sample and year

	P-Sample		F-Sample		percentage	percentage
	number of	number of	number of	number of	identical	common
year	households	individuals	families	individuals	overlap (P:F)	individuals
1968	261,102	640,202				
1969	267,912	649,542				
1970	270,259	629,069				
1971	268,129	710,090				
1972	268,103	709,722				
1973	268,820	697,714				
1974	270,554	705,580				
1975	272,739	703,978				
1976	273,446	700,985				
1977	274,643	700,099				
1978	272,651	693,697				
1979	274,016	692,866				
1980	274,774	688,910				
1981	275,173	685,804				
1982	275,151	687,341				
1983	273,832	675,478				
1984	275,628	677,777				
1985	276,471	673,981				
1986	277,341	670,428				
1987	278,288	669,943				
1988	281,178	671,950				
1989	282,127	680,026				
1990	285,272	693,590				
1991	284,975	672,857	285,102	772,253	65.0	98.1
1992	286,745	671,742	286,860	777,973	64.4	98.2
1993	288,801	696,753	289,022	784,065	67.6	98.4
1994	291,095	698,601	291,396	790,005	67.9	98.7
1995	292,117	698,513	292,396	790,252	67.9	98.7
1996	297,249	701,037	297,832	793,016	68.6	98.8
1997	298,008	679,720	298,479	787,294	67.0	98.8
1998	298,510	680,108	299,053	784,865	67.5	98.8
1999	293,190	785,924	299,842	785,924	88.7	100.0
2000	300,379		300,781	785,985		
2001	301,564		301,946	785,957		
2002	303,315		303,652	787,973		
2003	305,384		305,633	791,141		
2004	307,441		307,687	794,386		
2005	308,506		309,833	797,654		

Source: Linda (1968P-2005F).

Table A.2: Descriptive regressions

dependent variable:	Shorrocks' measure	percentage share remaining in: P97–P98	P98–P99	the top percent
trend	0.0147***	-1.66***	-1.61***	-1.12***
	(0.0029)	(0.39)	(0.30)	(0.20)
trend$^2/10$	-0.00347***	0.386***	0.379***	0.271***
	(0.00075)	(0.104)	(0.080)	(0.053)
change in assessment of single family houses' tax values	0.00669***	-0.819***	-0.828***	-0.346***
	(0.00095)	(0.131)	(0.100)	(0.066)
change in small businesses' wealth tax values	-0.00420***	0.533***	0.459***	0.261***
	(0.00091)	(0.125)	(0.096)	(0.064)
change in exemption difference between couples and singles	0.148**	-34.2***	-5.45	-4.46
	(0.056)	(7.74)	(5.93)	(3.94)
constant	0.217***	65.1***	77.4***	92.8***
	(0.024)	(3.30)	(2.53)	(1.68)
$F(5,31)$	19.26	17.98	22.78	14.16
prob $> F$	0.000	0.000	0.000	0.000
R^2	0.756	0.744	0.786	0.695
adj R^2	0.717	0.702	0.752	0.646
root MSE	0.0427	5.89	4.514	2.997
number of observations	37	37	37	37

Notes. Standard errors within parentheses.
*** denotes statistical significance at the 1 percent level.
** denotes statistical significance at the 5 percent level.

Appendix B The Swedish wealth tax

The Swedish wealth tax in its modern form was introduced in 1948 when there was an extensive tax reform. It has never been a major source of government revenue. The main arguments for it has been equity and redistribution. The wealth tax was repealed from 2007 by the then newly elected right-wing government.[10] The tax remains a hot political topic, the Social Democrats said that they would reintroduce the tax if they regained power in the 2010 parliamentary election. The Social Democrats, however, lost the election.

The main features of the wealth tax were unchanged over the main observation period, 1968–2005. It differed from other taxes in that it was levied at the household level and not individual level as the other personal taxes are. This was, in other words, the only example when the household, and not the individual or the firm, was the unit of taxation.[11]

The net wealth of the adult members of the household was added together with the net wealth of the minor children of the household. The tax base was a comprehensive measure of household net wealth (including real assets and financial assets minus debts).[12] Household tax liability was subsequently individualized according to the net wealth share of the individual within the household.

Taxable wealth did not include pension wealth in the sense that the value of future public and occupational pensions were not included neither were savings in tax deferred pension savings accounts. The values of cars, boats, art, and life insurance were not included. In addition, there was far from complete coverage of assets abroad. The tax base primarily consisted of assets for which it was possible to get third party reporting from banks, financial institutions, public agencies, etc.

The wealth tax system was conceptually simple. There was a generous exemption level, exempting, on average, more than 90–95 percent of all households from paying any taxes at all. We refer to this as tax bracket zero with a marginal tax rate of zero. As of 2001, households with two adult spouses got a higher exemption than single households.

Subsequently, (progressively) positive marginal tax rates were applied to subsequent brackets. In later years, the system was simplified to a two-bracket system with a zero-marginal rate in bracket zero and a single positive one. Tax reforms were discontinuous but frequent and marginal, in that every few years bracket limits have been adjusted, marginal rates have been changed, or the number of tax brackets has been varied. In addition, in all years between nominal changes, the real value of the exemption threshold was affected by inflation (fiscal drag).

[10] The Swedish repeal of the wealth tax followed similar repeals in Austria (from 2001), Denmark (from 1997), Finland (from 2006), and Italy (from 2005).

[11] The personal income tax was joint between spouses before 1971. From 1966 couples could, however, apply to be treated as single filers, see Selin (2009).

[12] The owner to the international clothing retail company H&M threatened to leave the country in 1990s. The government, therefore, introduced some new valuation principles that in practice meant that a handful superrich basically became tax exempt.

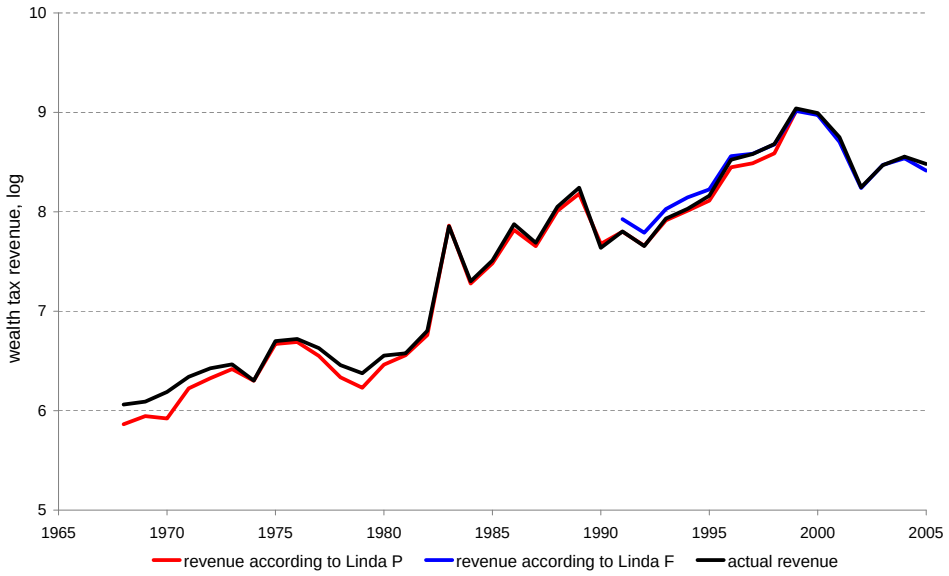

Figure B.1: Wealth tax revenue: Actual and calculated from the LINDA samples

Table B.1 reports the main aspects of the Swedish wealth tax exemptions and rates during the period 1948–2006.

Figure B.1 shows how wealth tax revenue calculated using the households in the LINDA samples corresponds total wealth tax revenue. It is clear from the figure that tax revenue according to the micro data tracks total tax revenue surprisingly well.

Table B.1: Wealth tax rates, 1948–2006.

law	from: Net wealth Dec 31	from: assessment year	exemption, SEK 1,000 singles	exemption, SEK 1,000 couples	n of brackets	top rate, %	source
1947 CGWL	1948	1949	30		5	1.8	SSB 1947:577
	1953	1954	50		6	1.8	SSB 1947:577, SSB 1952:407
	1957	1958	100		6	1.8	SSB 1947:577, SSB 1957:106
	1966	1967	100		5	1.8	SSB 1947:577, SSB 1965:73
	1971	1972	150		4	2.5	SSB 1947:577, SSB 1970:170
	1974	1975	275		4	2.5	SSB 1947:577, SSB 1974:311
	1981	1982	400		4	2.5	SSB 1947:577, SSB 1980:1055
	1983	1984	400		4	3	SSB 1947:577, SSB 1982:1190
1983 TCGWL	1983 only	1984 only	300		5	4	SSB 1983:968
	1985	1986	400		4	3	SSB 1947:577, SSB 1984:1080
	1990	1991	800		3	3	SSB 1947:577, SSB 1989:1026
	1991	1992	800		2	2.5	SSB 1947:577, SSB 1991:416
	1992	1993	800		1	1.5	SSB 1947:577, SSB 1992:1489
	1996	1997	900		1	1.5	SSB 1947:577, SSB 1996:690
1997 CGWL	1997	1998	900		1	1.5	SSB 1997:323
	2001	2002	1,000	1,500	1	1.5	SSB 1997:323, SSB 2000:1422
	2002	2003	1,500	2,000	1	1.5	SSB 1997:323, SSB 2001:836
	2005	2006	1,500	3,000	1	1.5	SSB 1997:323, SSB 2004:1039
repeal	2007	2008					SSB 1997:323, SSB 2007:1403

Notes. CGWL is Central Government Wealth Tax Law, TCGWL is Temporary Central Government Wealth Tax Law, SSB (*SFS*) is Swedish Statute Book