

Wealth Accumulation by Age Cohort in the U.S., 1962–1992: The Role of Savings, Capital Gains and Intergenerational Transfers

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A simulation model is developed to account for observed changes in mean household wealth both overall and by age cohort over the 1962–92 period in the U.S. There are three major findings. First, capital gains are the major factor explaining overall wealth changes and account for three-fourths of the simulated growth in wealth over the entire period, while savings account for the other quarter. Second, for cohorts under age 50, *inter vivos* transfers dominate observed changes in wealth. Indeed, the oldest age groups appear to have transferred sizable amounts of their wealth to younger generations *inter vivos*, raising the wealth of these younger groups substantially above what it would be based on saving alone. Third, over the lifetime, I estimate that savings, inheritance, and *inter vivos* transfer each contribute about one-third to the lifetime accumulation of wealth.

1. Introduction

In this paper I analyze the sources of household wealth accumulation in the U.S. over three decades, from 1962 to 1992. Three issues receive particular attention. First, on the aggregate level, what is the relative importance of savings and capital gains on existing wealth as sources of overall wealth growth? Second, for individual age cohorts, what are the relative contributions of the following four components of wealth accumulation: (i) savings from income in the national accounting sense, of income less consumption expenditures; (ii) revaluation of existing wealth due to changes in asset prices; (iii) inheritance; and (iv) *inter vivos* transfers. Third, what is the relative importance of intergenerational transfers versus savings in the lifetime accumulation of wealth?

The analysis is based on a simulation model originally developed in Greenwood and Wolff (1992). In the simulation, initial wealth holdings by age group, as reported in the 1962 Survey of Financial Characteristics of Consumers (SFCC), are updated annually on the basis of savings rates, computed from Consumer Expenditure Survey data, and capital gains by individual asset type. Age- and gender-specific mortality rates are introduced to simulate intergenerational bequests. In modeling the inheritance process, I assume that wealth is passed first to a surviving spouse and then upon the death of that spouse (if no remarriage occurs in the interim) to the generation containing the decedent's children. The selection of the inheriting cohort is based on the average age difference between parent and child.

The results of the paper shed new light on the role of inheritance and life-cycle savings as factors in wealth accumulation. There is wide disagreement in the existing literature on the relative importance of these two factors. For example, while Modigliani (1988) argued that

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intergenerational transfers account for only about 20 per cent of the accumulation of household wealth, Kotlikoff (1988) put the figure closer to 80 per cent (also see Kessler and Masson, 1989 for a good summary as well as Kotlikoff and Summers, 1981; Blinder, 1988; and Wolff, 1988).

In this work, I consider the contribution of all savings, not only life-cycle savings, to the accumulation of household wealth, and the role of *inter vivos* transfers along with inheritance. I estimate that inheritance alone contributes about one-third to the overall growth in wealth over the lifetime and *inter vivos* transfers another third, with savings contributing the remaining third. Over the lifetime, two-thirds of the growth in household wealth is accounted for by intergenerational transfers.

Other results are also striking. It will be clear that savings, in the conventional sense, account for only a small proportion of aggregate household wealth accumulation – about one-fourth – while capital gains provide the other three-fourths. Moreover, it will be argued that *inter vivos* transfers, not inheritance, is the major source of wealth among younger families. In addition, it will be shown that capital gains on the initial endowments of household wealth provide for a large part of the subsequent growth in household wealth.

In the sections below I outline the basic accounting framework (section 2), discuss the data sources used in the analysis and present descriptive statistics (section 3), summarize the simulation model that forms the central part of the analysis in the paper (section 4), and present the results of the simulation exercise (section 5). The final section (section 6) highlights the most important findings as well as some broader implications of the results.

2. The accounting framework

I can represent the average wealth of cohort c at time t in the following manner:

$$W_{ct} = (1 + r_{ct})W_{c,t-1} + s_{ct}Y_{ct} + G_{ct}, \quad (1)$$

where:

- W = net worth (in constant dollars)
- r = real rate of return on wealth
- Y = household income (in constant dollars)
- s = savings rate out of household income Y
- G = net inheritances and gifts (in constant dollars).

Then,

$$\Delta W_{ct} \equiv W_{ct} - W_{c,t-1} = r_{ct}W_{c,t-1} + s_{ct}Y_{ct} + G_{ct}. \quad (2)$$

There are three sources of wealth accumulation. The first is the revaluation of existing wealth. The second is savings out of income, as defined in the national income and product accounts. The third includes inheritances and *inter vivos* transfers.

The concept of wealth used here is marketable wealth. I therefore exclude social security wealth and defined benefit (DB) pension wealth, as well as consumer durables. Net worth equals the sum of owner-occupied housing and other real estate, bank deposits and other liquid assets, corporate stock, bonds, and other securities, equity in unincorporated businesses and trust funds, the cash surrender value of life insurance and pension plans less all household debt. Household wealth is counted in the age cohort of the head of household. It should be noted that defined contribution pension accounts, such as IRAs, Keogh plans,

401(k) plans, and similar funds, are included in wealth since they have a marketable value and are transferable. Social security and DB pension wealth, on the other hand, are not transferable and, as a result, are excluded here.

I use the national income concept of household income, which is the sum of labor earnings (wages and salaries and proprietor income), property income (interest, dividends, and rent), pension income, and government transfers (including social security benefits, unemployment compensation, welfare payments, and the like). It should be noted at the outset that there is a degree of arbitrariness in separating out capital gains from property income. Corporate bonds provide an example of this, where it is possible to trade off capital gains and interest payments. In other words, two bonds may have the same yield but carry different interest payments by selling at different discount rates. In the national accounts, the interest payment will be classified as household income but capital gains will not. A similar situation exists with corporate stock, where different combinations of dividend payments and capital gains may produce the same yield. In national accounts, the dividends will be included in national income whereas the capital gains will be excluded.

I follow the national accounting convention by making the same division between property income and capital gains. A practical reason for doing this is that the basic savings and income data are in terms of total household income, including conventional property income. If anything, I believe that this division errs on the side of caution by overstating the contribution of conventional household savings to wealth accumulation and understating the importance of capital gains.

A few words should also be said at this point about three factors that influence the pattern of wealth accumulation over time: age, cohort, and period effects. Economic theory emphasizes the importance of age, or life cycle, effects which are assumed to be relatively stable across periods and cohorts, in explaining the pattern of saving over time (see, for example, Modigliani and Brumberg, 1954, or Ando and Modigliani, 1963). Period effects are caused by factors which affect the economy as a whole at a given point in time, such as a recession, inflation, productivity growth, and rates of return to assets.

Birth year (or cohort) affects the experience of its members in two ways. First, it interacts with period events such as recession or war to cause particular individuals to experience the same event at different points in their life cycle. For example, individuals who grew up during the Great Depression of the 1930s may tend to be more frugal and have a greater savings propensity than those who lived their childhood during prosperous times. Second, a cohort effect may relate to the peculiarities of a particular birth group, such as the “baby boomers” who, because, of their large number, may not have fared as well economically as those born in smaller birth cohorts.

It should be noted that one cannot completely separate cohort, period, and life-cycle effects from each other, since they are linearly dependent. However, later, I provide some analysis on the probable importance of each of these effects in explaining the pattern of wealth accumulation by age group.

3. Data sources and descriptive statistics

The analysis covers three decades by using microdata on household wealth in the United States for 1962, 1973, 1983, and 1992. Each sample includes extensive information on the net worth of households at the microdata level and oversamples high-income households. Wealth and income figures are converted to 1992 dollars using the CPI–All Urban Consumers (which is the standard consumer price index).

For 1962, I use the Federal Reserve Board's Survey of Financial Characteristics of Consumers or SFCC (see Projector and Weiss, 1966). The 1973 wealth data are based on administrative records from income and estate tax matched to the Current Population Survey of that year, but is again a stratified random sample of all U.S. households (see Greenwood, 1983, for details). The 1983 data are from the Federal Reserve Board's Survey of Consumer Finances (see Avery et al., 1984). The 1992 data are also drawn from the Survey of Consumer Finances (see Kennickell and Starr-McCluer, 1994). The survey data report year end wealth and income, while the administrative data reflect an average wealth and income over the year reported. Thus, the 1973 figures probably correspond most closely to "mid-year" estimates and combined with the 1962 and 1983 data give two ten-and-a-half-year periods over which to compare changes in wealth.

Under-reporting relative to the national balance sheets occurs in all three samples. Therefore, asset and liability figures for each year have been aligned to national balance sheet totals for the household sector (see Wolff, 1987, for a description for the 1962 SFCC and the 1983 SCF; see Greenwood and Wolff, 1988, for the 1973 data; and Wolff, 1996, for the 1992 data).¹

Since I am using averages for birth cohorts over time as the unit of analysis, as long as each of these samples is representative of the U.S. population, comparability problems are not likely to be significant. Obviously, some additional sampling error is introduced by the fact that these are different samples rather than panel data. However, no panel data exists upon which to base an analysis of this kind.²

Income

Table 1 shows computations of average income in 1992 dollars by 13 age groups in 1962, 1983, and 1992. The figures in Table 1 reveal an almost perfect life-cycle pattern of income, with income rising monotonically between the youngest age class, under 25, and age class 40–44 or 45–49, and then declining monotonically with age up to age class 80 and over.³ This is consistent with typical age–earnings profiles, which show labor earnings increasing with age until age 40–50 and then declining and with the fact that capital income and transfer payments constitute a larger share of total income for the elderly. However, the age–income profiles are not stable over time, and while the relative level of income for the four youngest age groups (under 40) declined between 1962 and 1992, it rose for middle-age groups (ages 40 to 59). The pattern for the oldest four age groups (65 and over) is mixed.

¹ Differences in asset definitions may also affect comparability among the three datasets. The 1962, 1983 and 1992 surveys were conducted by the Federal Reserve Board and their asset and liability concepts are quite similar. The 1973 data are developed from a synthetic dataset, and every attempt has been made to make the corresponding wealth categories as similar as possible to the ones used in 1962 and 1983. Resulting errors are reduced by alignment to consistent national balance sheet totals.

² The Panel Study of Income Dynamics, the most likely choice, has wealth data which cover a much shorter period of time, 1984–1994. Moreover, because it oversamples low-income rather than high-income individuals and top codes a great deal of the information useful in estimating and analyzing wealth, it has substantial under-reporting problems. See, for example, Curtin, Juster, and Morgan (1989) and Wolff (forthcoming) for comparisons of the SCF and the PSID wealth data.

³ It should be noted that the relatively low figures for the youngest and oldest age cohorts reflect, in large part, the low labor force participation rates of these groups.

Table 1:
Mean income by age group and year, 1962–1992

Age group	Mean income ^a			Ratio of mean income to the overall mean			Annual percentage growth in income by 1962 birth cohort, 1962–92
	1962	1983	1992	1962	1983	1992	
Under 25	17,162	19,923	15,710	0.58	0.49	0.37	4.33
25–29	27,850	29,575	27,951	0.94	0.73	0.65	2.52
30–34	30,116	39,037	38,115	1.02	0.97	0.89	1.60
35–39	34,254	46,590	41,564	1.16	1.15	0.97	0.19
40–44	35,593	51,255	65,225	1.20	1.27	1.52	–1.06
45–49	37,491	53,753	57,127	1.27	1.33	1.33	–0.91
50–54	35,102	50,614	62,893	1.19	1.25	1.47	–1.84
55–59	34,410	52,227	59,400	1.16	1.29	1.39	
60–64	26,396	48,616	48,657	0.89	1.20	1.14	
65–69	22,720	43,410	36,280	0.77	1.07	0.85	
70–74	21,567	27,122	25,881	0.73	0.67	0.60	
75–79	15,296	22,034	28,498	0.52	0.55	0.67	
80+	10,371	18,721	20,233	0.35	0.46	0.47	
Mean	29,620	40,405	42,793	1.00	1.00	1.00	

^aAll income figures are in 1992 dollars.

Source: Own calculations from the 1962 SFCC, the 1983 SCF, and the 1992 SCF.

In the aggregate, average income in real terms grew over the three years but the rate of growth slowed down, from 1.48 per cent per year in 1962–83 to 0.64 per cent per year in 1983–92. Between 1962 and 1983, all age groups gained in real terms. However, between 1983 and 1992, the youngest four age groups (under age 40) all experienced a reduction of real income, whereas it grew for the five middle-age groups (age 40 to 65). The pattern is again mixed for the oldest four age groups (65 and over).

The last column shows the annual rate of growth of mean income by 1962 birth cohort. As expected, there is an almost perfect inverse correlation between age (in 1962) and income growth, with the youngest age cohorts experiencing the highest growth rates and the oldest ones the lowest.

Savings rates

Savings rates, shown in Table 2, are computed from the Consumer Expenditure Surveys (CES) in 1962, 1972–73, 1983, 1984, and 1992, the only source from which saving by age group is available. Although the National Income and Product Account (NIPA) concept of saving would be preferable to the CES, which treats housing expenditures as consumption rather than savings and thus understates the savings rates, I believe that the use of cohort-specific CES savings rates as a proxy is preferable to using non-age specific NIPA rates. However, the CES concept of savings does treat mortgage principal repayments as savings

Table 2:
Average savings rate by age cohort and period, 1962–92

Age class (as of beginning period)	Average savings rate over the period (percentage)			Ratio of cohort savings rate to the overall mean		
	1962–73	1973–83	1984–92	1962–73	1973–83	1984–92
Under 25	1.25	–2.85	0.33	0.21	–0.89	0.06
25–29	1.44	–1.57	2.61	0.24	–0.49	0.46
30–34	7.14	3.73	4.77	1.21	1.16	0.84
35–39	5.20	3.73	6.61	0.88	1.16	1.16
40–44	7.33	5.56	8.69	1.24	1.73	1.53
45–49	7.19	7.29	8.50	1.22	2.27	1.49
50–54	8.15	7.95	7.43	1.38	2.48	1.31
55–59	9.04	8.75	7.24	1.53	2.73	1.27
60–64	7.37	4.55	6.33	1.25	1.42	1.11
65–69	5.71	–0.25	3.16	0.97	–0.08	0.56
70–74	4.60	0.03	0.67	0.78	0.01	0.12
75–79	3.71	0.03	0.47	0.63	0.01	0.08
80+	3.71	0.03	1.48	0.63	0.01	0.26
Mean	5.91	3.21	5.69	1.00	1.00	1.00

Source: *Consumer Expenditure Surveys*, 1962, 1972–73, 1983, 1984, and 1992.

and expenditures on consumer durables as consumption, which is consistent with my definition of household wealth.

Savings rates, like income, show a striking life-cycle pattern, with savings rates increasing almost monotonically from the youngest age group to age group 55–59 in both the 1962–73 and 1973–83 periods and to age group 40–44 in the 1984–92 period and then falling off almost monotonically with age. This result is consistent with life-cycle models, in which the young dis-save (incur debt) to invest in human capital, consumer durables, or housing while their incomes are still relatively low, the middle-aged begin to retire that debt and build up both real and financial assets, and the elderly draw down wealth in their retirement years (see Modigliani and Brumberg, 1954, for example).

There is also evidence of a very strong period effect, with the average savings rate declining from 5.9 per cent in 1962–73 to 3.2 per cent in 1973–83 and then increasing to 5.7 per cent in 1984–92. Savings rates also fall off for every age group except one (age group 45–49) between the first two periods and increase for every age group except age groups 50–54 and 55–59 between the last two periods.

Portfolio composition

Table 3 shows the composition of household assets for selected components of the household portfolio by year and age group. Portfolio composition shows strong life-cycle effects. Both housing and debt decrease as a percentage of gross assets rather systematically with age. In contrast, both financial securities and corporate stock generally increase in importance with age as a component of wealth. Net equity in unincorporated business rises

with age as a percentage of gross assets (peaking at age 40–44 in 1962, 50–54 in 1983, and 60–64 in 1992) and then declines. Neither the share of assets invested in liquid assets nor in other (non-home) real estate shows much systematic relation to age. Pension accounts, not surprisingly, increase in importance with age until age 60 and then fall off.

There are also some rather striking period effects. Between 1962 and 1983, owner-occupied housing increased in importance in the household portfolio, from 26 to 30 per cent of gross assets and then remained at this level in 1992. Unincorporated business equity and other real estate also increased in importance between 1962 and 1983 (from 15.5 to 18.8 per cent and from 6.3 to 14.9 per cent, respectively) and then showed little change from 1983 to 1992. In contrast, financial securities, stocks, and trust fund equity as a group declined from 32 per cent of gross assets to 16 per cent between 1962 and 1983 and then remained at 16 per cent in 1992. Corporate stock (including an allocated portion of trust funds) dropped from 24 to 11 per cent of gross assets from 1962 to 1983. Liquid assets fell from 19.5 per cent of gross assets to 17.4 and 12.2 per cent over the three years but this reduction was almost exactly offset by the rising share of pension assets, from 0.3 to 1.5 and 7.2 per cent, respectively. Total debt fell slightly as a proportion of gross assets, from 14.1 to 13.1 per cent from 1962 and 1983 but then rose to 15.7 per cent in 1992. These increases and declines by portfolio component are evident for almost every age group.

Rates of return

Table 4 shows the annual average rates of return by asset type. Over the 1962–83 period, financial securities had the highest yield, at 8.0 per cent per year, followed by non-home real

*Table 3:
Portfolio composition by age class, 1962, 1983, and 1992*

Age group	(% of gross assets)											
	Owner-occupied housing ^a			Liquid assets ^b			Financial securities ^c			Corporate stock ^d		
	1962	1983	1992	1962	1983	1992	1962	1983	1992	1962	1983	1992
18–24	49.7	44.7	45.8	28.6	25.0	16.1	4.1	0.2	2.4	9.3	3.2	6.6
25–29	52.6	46.0	42.4	16.1	18.6	13.0	3.7	1.4	4.4	16.3	3.3	8.1
30–34	31.3	47.8	50.6	12.2	16.0	13.2	10.5	2.3	1.0	33.0	4.3	3.9
35–39	33.3	43.6	44.0	15.3	14.6	8.5	8.6	3.0	1.9	19.7	4.2	5.7
40–44	33.7	42.0	35.2	20.5	15.5	10.0	5.6	2.2	10.6	10.8	5.0	6.6
45–49	36.2	26.0	31.9	19.3	9.6	8.1	7.8	4.2	3.2	12.7	13.3	7.3
50–54	27.4	34.8	25.3	21.0	15.8	8.7	5.8	3.8	5.1	18.1	10.1	9.1
55–59	20.8	25.5	23.4	17.3	16.8	10.7	9.0	4.7	4.6	26.8	11.4	13.2
60–64	21.4	26.5	23.4	21.7	20.8	11.1	9.5	5.9	4.8	26.2	12.2	10.6
65–69	17.9	19.3	24.7	18.4	18.9	12.1	11.2	7.2	6.2	28.0	12.3	15.3
70–74	15.8	24.0	22.8	21.9	22.9	17.8	10.0	7.2	6.8	35.0	21.5	12.3
75–79	16.4	23.9	30.0	23.1	24.4	25.1	15.8	8.2	9.5	36.0	18.5	11.5
80+	19.7	22.5	26.6	31.4	34.6	23.1	6.3	4.5	9.9	38.1	16.1	21.2
All	26.1	30.1	29.8	19.5	17.4	12.2	8.7	4.7	5.7	23.6	11.1	10.3

Table 3:
(Continued)

Age group	Business equity ^c			Other real estate ^f			Pension accounts ^g			Total debt ^h		
	1962	1983	1992	1962	1983	1992	1962	1983	1992	1962	1983	1992
18–24	2.2	5.1	12.2	5.0	9.3	8.2	1.2	0.6	5.2	91.9	44.1	42.5
25–29	9.3	13.0	14.0	1.1	15.6	11.3	0.9	0.5	4.4	48.5	40.7	41.4
30–34	9.3	15.5	13.3	3.1	10.9	9.5	0.5	1.4	6.4	32.1	34.5	40.8
35–39	17.3	19.0	20.3	5.3	12.8	10.8	0.5	1.5	6.9	27.8	27.0	34.0
40–44	20.5	16.8	19.7	8.6	14.0	7.8	0.4	2.3	7.3	21.1	24.7	21.8
45–49	18.0	26.1	19.8	5.6	17.1	18.2	0.4	2.1	8.8	19.2	14.8	20.0
50–54	20.1	24.3	19.9	7.3	7.7	17.7	0.3	2.3	11.5	15.9	9.7	14.6
55–59	18.7	23.5	18.5	7.2	14.7	16.7	0.2	2.0	10.5	7.0	9.5	11.4
60–64	14.9	19.0	23.3	6.1	12.7	18.0	0.2	1.6	6.4	6.6	7.0	10.0
65–69	14.9	14.5	19.1	9.4	26.9	13.4	0.1	0.5	6.5	4.5	2.8	7.1
70–74	11.1	12.9	13.6	6.1	10.0	19.2	0.1	0.8	5.0	3.1	1.1	3.4
75–79	5.8	13.4	6.2	2.9	10.8	13.5	0.0	0.1	2.5	3.4	3.5	3.5
80+	2.3	8.6	5.1	2.2	12.7	12.2	0.0	0.0	0.2	1.4	0.8	2.0
All	15.5	18.8	17.7	6.3	14.9	14.7	0.3	1.5	7.2	14.1	13.1	15.7

Source: Own calculations from the 1962 SFCC, the 1983 SCF, and the 1992 SCF.

^aPrincipal house only in 1983 and 1992.

^bIncludes cash, currency, demand deposits, time deposits, savings accounts, CDs, money market funds, and the cash surrender value of life insurance.

^cIncludes corporate bonds, government bonds, foreign bonds, other fixed-interest financial securities, and allocated portion of trust fund equity (21 per cent).

^dIncludes mutual funds and allocated portion of trust fund equity (79 per cent).

^eNet equity in unincorporated farm and non-farm businesses.

^fIncludes all real estate except principal residence.

^gIncludes IRAs, Keogh plans, 401(k) plans, and other defined contribution retirement accounts.

^hIncludes mortgage, installment, consumer, and other debt.

estate (7.8 per cent) unincorporated business equity (7.6 per cent), and owner-occupied housing (6.6 per cent). The average interest rate on liquid assets was 5.1 per cent and the average yield on corporate stock only 4.5 per cent. Both returns were less than the rate of inflation, 5.7 per cent per year.

In contrast, in the 1983–92 period, the highest return was on corporate stock, at over 10 per cent per year, followed by financial securities (10.0 per cent), liquid assets (6.9 per cent), and owner-occupied housing (5.3 per cent). The average annual return on non-home real estate was only 3.1 per cent and that on unincorporated business equity a dismal 0.9 per cent – both less than the annual average inflation rate of 3.8 per cent.

Table 5 shows how average rates of return, based on the average portfolio composition of each age group, varies by age group and period. Average returns on gross assets increase slightly with age, although the differences are small and the pattern far from uniform. In contrast, the return on net worth declines almost monotonically with age, from 621 per cent

Table 4:
Average annual nominal rates of return by asset type, 1962–1992 (%)

	1962–83	1983–92	1962–92
A. Owner-occupied housing ^a	6.55	5.32	6.18
B. Savings and time deposits ^b	5.14	6.87	5.66
C. Financial securities ^c	7.98	9.97	8.58
D. Corporate stock prices ^d			
(i) NYSE Composite	4.58	10.06	6.23
(ii) Standard & Poor 500 Index	4.50	10.58	6.32
E. Unincorporated business equity ^e	7.55	0.91	5.56
F. Non-home real estate ^f	7.81	3.14	6.41
G. Pension accounts ^g	5.87	9.14	6.85
H. CPI-U ^h	5.68	3.81	5.12

^aFigures based on the median sales price for existing one-family houses. Source: U.S. Bureau of the Census, *Statistical Abstract of the United States*, various years.

^bIncludes time deposits, savings accounts, CDs, money market funds, and the cash surrender value of life insurance. The figure is a weighted average of the interest rates of the various components, where the stocks of each asset held by the household sector are used as weights. Sources: Board of Governors of the Federal Reserve System, *Balance Sheets for the U.S. Economy, 1949–94*, 8 June 1995; U.S. Bureau of the Census, *Statistical Abstract of the United States*, various years; Council of Economic Advisers, *Economic Report of the President, 1997*, February 1997.

^cThe figure is a weighted average of yields on U.S. treasury securities and corporate bonds (Moody's average for Aaa and Baa bonds). Source: Council of Economic Advisers, *Economic Report of the President, 1997*, February 1997.

^dSource: Council of Economic Advisers, *Economic Report of the President, 1997*, February 1997.

^eFigures are based on the revaluation of unincorporated business equity held by the household sector as a per cent of the initial value in each year. Source: Board of Governors of the Federal Reserve System, *Balance Sheets for the U.S. Economy, 1949–94*, 8 June 1995.

^fFigures are based on the revaluation of the non-home real estate held by the household sector as a per cent of the initial real estate value in each year. Source: Board of Governors of the Federal Reserve System, *Balance Sheets for the U.S. Economy, 1949–94*, 8 June 1995.

^gCalculated as a weighted average of money market fund yields, financial security yields, and corporate stock price gains, where the weights are the share of each held in pension accounts.

^hSource: Council of Economic Advisers, *Economic Report of the President, 1997*, February 1997.

for the youngest group to 35 per cent for the oldest in the 1962–73 period, from 72 to 26 per cent in the 1973–83 period, and from 61 to 25 per cent in the 1983–92 period. This pattern is almost entirely due to the greater debt to equity ratio of younger families relative to older ones. Indeed, these results illustrate that inflation helps households with low net worth, who, on average, have sizable debt, since inflation reduces the value of their debt in real terms.

Average returns declined somewhat in the second period, reflecting declines in returns on all assets but unincorporated business equity. This decline also characterizes every age group except one. Likewise, the average rate of return on net worth falls somewhat again in the third period (though note that the period is shorter), and this reduction again occurs for every age group. The main reason here is the decline in the returns on unincorporated business equity and non-home real estate.

Table 5:
Real cumulative rates of return by age class, 1962–73, 1973–83, and 1983–92^a (% increase over period)

Age class (beginning of period)	Gross assets			Net worth		
	1962–73	1973–83	1983–92	1962–73	1973–83	1983–92
All	30.8	27.4	13.2	41.2	36.5	22.7
Under 25	20.5	20.0	13.3	621.3	72.0	61.4
25–29	27.8	23.1	11.1	84.0	62.0	51.9
30–34	34.9	24.5	10.6	66.4	55.1	45.5
35–39	30.3	24.9	8.8	54.2	46.3	31.6
40–44	27.0	24.9	13.1	42.7	44.0	29.7
45–49	27.0	30.9	9.5	40.9	42.0	20.0
50–54	29.7	28.3	12.2	41.4	34.8	20.2
55–59	33.0	28.3	13.6	37.9	34.7	20.2
60–64	31.1	27.3	11.5	35.6	31.8	16.5
65–69	32.4	26.8	14.3	35.4	28.5	17.3
70–74	34.1	29.6	18.2	36.2	30.3	19.8
75–79	31.5	28.3	20.9	33.8	30.5	23.3
80+	33.7	25.9	24.1	34.7	26.4	25.2

^aThis is defined as the nominal yield minus the change in the CPI, compounded over the period. Results are based on the average portfolio composition by age group over the period.

Age-wealth profiles

As shown in Table 6, the cross-sectional data follow the predicted hump-shaped life-cycle pattern of wealth by age class fairly closely, with the exception of a few “dips” in mean wealth in age ranges 50–64. Mean wealth increases with age until close to retirement years (ages 55–59 in 1962, ages 65–69 in 1973 and 1983, and ages 55–59 in 1992) and then declines. The results are generally consistent with the life-cycle model of wealth accumulation. However, as Shorrocks (1975) and Jianakoplos, Menchik, and Irvine (1989) have demonstrated, a cross-sectional profile cannot be taken as confirmation of the life-cycle hypothesis for two reasons. In an economy with rising productivity levels, successive cohorts are likely to have rising incomes (and wealth) so that the lower wealth of the very old is a cohort rather than a life-cycle effect. On the other hand, the correlation of mortality rates with wealth among the elderly will result in a higher mean wealth for survivors than would have existed for the entire group (see Wolff, 1988 for a more extended discussion).

A closer look at the table reveals that despite an overall similarity in pattern a shift away from the young and the very old to the middle-aged occurred between 1962 and 1983. Younger families (under age 45) had a higher mean wealth relative to the overall mean in 1973 than in 1962. By 1983, the new cohorts of young were relatively worse off than those of 1962 (40 per cent of the mean versus 50 per cent in the earlier year). The very elderly (70 and over) were 46 per cent above overall mean wealth in 1962 but only 21 per cent above the overall mean in 1983. At the same time, the mean wealth of middle-aged families (those with heads 45–69) was 73

Table 6:
Ratio of mean household net worth to the overall mean by age group, 1962–92

Age group	Year				Annual growth rate of wealth by birth cohort (as of the start of period)			
	1962	1973	1983	1992	Annual growth rate of wealth by age group (percentage)		1962–83	1983–92
18–24	0.01	0.27	0.07	0.08	11.95	2.68	23.68	18.13
25–29	0.20	0.52	0.17	0.15	1.13	–0.21	12.31	12.60
30–34	0.46	0.65	0.36	0.31	0.59	–0.49	6.62	12.49
35–39	0.64	0.87	0.63	0.47	1.80	–2.07	6.25	7.85
40–44	0.84	0.94	0.79	0.99	1.49	3.72	5.24	9.82
45–49	0.98	1.06	1.77	1.15	4.64	–3.56	6.00	1.60
50–54	1.06	1.07	1.26	1.71	2.65	4.53	3.18	5.06
55–59	1.82	1.16	1.61	1.84	1.25	2.63	–0.34	1.75
60–64	1.34	1.22	1.72	1.79	3.03	1.62	0.09	–0.71
65–69	1.74	1.65	2.35	1.70	3.25	–2.45		–5.15
70–74	1.58	1.60	1.42	1.45	1.28	1.48		–1.21
75–79	1.51	1.33	1.16	1.33	0.55	2.76		
80+	1.16	1.64	0.93	1.14	0.77	3.47		
Under 45	0.50	0.65	0.40	0.44	0.79	2.29		
45–69	1.35	1.21	1.73	1.60	3.01	0.35		
70+	1.46	1.53	1.21	1.32	0.91	2.16		
All	1.00	1.00	1.00	1.00	1.82	1.20		

All wealth figures are in 1992 dollars. Sources: 1962 – *Survey of Financial Characteristics of Consumers*; 1973 – *Tax-Census Merge File* (Greenwood, 1983); 1983 – *Survey of Consumer Finances*; and 1992 – *1992 Survey of Consumer Finances*.

per cent greater than the overall mean in 1983, compared to 35 per cent greater in 1962. Over the two decades, the age–wealth profile became steeper and peak wealth moved to an older age group. The 1983 peak, of 2.35 times the overall mean, occurred in the 65–69 age group while the 1962 peak, of 1.82 times the overall average, was found in the 55–59 age bracket.

By 1992, the situation had reverted somewhat back to the pattern of 1962. The average net worth of households under the age of 45 was 44 per cent of the overall mean in 1992, greater than the 40 per cent figure in 1983 but still less than the 50 per cent relative level in 1962. Middle-aged households (age 45–69) saw their mean wealth fall to 1.60 times the overall mean in 1992, down from 1.73 in 1983 but still greater than the 1.35 figure in 1962. Likewise, the mean wealth of households over the age of 69 rose to 1.32 times the overall mean in 1992, from 1.21 in 1983, though this was still lower than the 1.46 figure in 1962.

The results thus indicate that the age–wealth profile is far from invariant over time, as standard versions of the life-cycle model often suggest. Indeed, the shape of the age–wealth

profile at any point of time reflects not only life-cycle effects but cohort and period effects as well.

The last two columns of Table 6 show the annual rate of growth of net worth by birth cohort defined as of the beginning of the period. The results are striking. Annual rates of increase in mean wealth by birth cohort between 1962 and 1983 ranged from 23.7 per cent to -0.2 per cent.⁴ Increases in net worth are consistently higher the younger the age cohort – a relationship robust across the nine birth cohorts. This is consistent with hump-shaped age–wealth profiles predicted by the life-cycle model. The same pattern holds for the period 1983–92. There is an almost monotonic decline in the rate of growth of average wealth by the age of the birth cohort, from 18.1 per cent per year for the youngest to -1.2 per cent per year for the oldest.

These results do, however, appear paradoxical when compared to savings rates by age group in Table 2 which show the youngest age groups with the lowest (and, indeed, in some cases, negative) savings rates. How can we reconcile these two apparently contradictory pieces of information? The puzzle, I argue, is solved when we consider intergenerational transfers.

4. Simulation model of cohort wealth changes

The approach used here borrows from both Wolfson (1980) and Masson (1986) who also examine cohort wealth patterns. However, I do not examine different patterns of family formation and dissolution as Masson did or of bequest patterns as Wolfson did. The focus here is on differences in wealth growth among age cohorts rather than within each cohort.

The starting point for the simulation is mean income and mean wealth by asset type for each single-year age class in 1962 and the simulation is performed on an annual basis. Over the course of the year, each asset (and debt) is revalued according to its rate of return. On the basis of the age group's average annual income and saving rates, saving out of income is added to the age group's wealth. Total dollars saved in that year are distributed at the end of the year to each asset in proportion to its share of gross assets (at the end of the year).

Death is assumed to occur at the end of year, which is estimated on the basis of gender and age specific mortality rates.⁵ The inheritance process is modeled on the assumption that wealth is passed first to a surviving spouse (if there is one) and then upon the death of that spouse (if no remarriage occurs in the interim) is passed to the generation containing the

⁴ The former number should be interpreted with some caution, as it was calculated based on the very low mean wealth of households headed by an individual under age 25 in 1962 from the 1962 SFCC (\$994 in 1992 dollars). There were relatively few of these households in comparison with 1983, in addition to the fact that many individuals under age 25 are still part of another household.

⁵ Data sources are as follows: (1) Average age of mother at birth by birth cohort, 1891–1976: U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 2* (Washington, D.C.), 1975, Series B11–19; and U.S. Bureau of the Census, *Statistical Abstract of the United States*, various years; (2) Average age difference between husband and wife: U.S. Bureau of the Census, *Current Population Reports*, various years; (3) Death rates per 100,000 by five-year age groups and sex, 1962–92: U.S. Department of Health and Human Services, Public Health Service, *Vital Statistics of the United States, Volume II – Mortality, Part A* (National Center for Health Statistics, Hyattsville, MD), 1987; and U.S. Bureau of the Census, *Statistical Abstract of the United States*, various years; (4) Households by type, 1962–1992: U.S. Bureau of the Census, *Current Population Reports*, various years.

decedent's children. The inheriting cohort is based on the average age difference between parent and child.⁶ In contrast to some other prior research (see, for example, Menchik and David, 1983; Laitner and Juster, 1996; and Wilhelm, 1996), I do not examine the division among these children but simply pass the wealth to the cohort in which the children are most likely to be found. All households in a cohort are treated identically regarding the age and existence of children.⁷

Average household wealth is recalculated for each cohort at year's end by adding up the total wealth of each of the three household types (two person, single male, and single female) and then dividing by the household count. Each year the household counts are realigned to U.S. Bureau of the Census figures. The simulations are run over two periods: 1962–1983 and 1983–1992.

Two notes of caution should be given at this point. First, I do not model active changes in portfolio composition, particularly in response to relative changes in rates of return to different assets. It is assumed that portfolio composition is fixed at the beginning of the simulation period and changes only by the revaluation of each asset type. As a consequence, the model likely understates the importance of capital gains in the wealth accumulation process, since active changes in portfolio composition to changing rates of return are not included. Second, the bequest model is quite simplistic and excludes charitable contributions, generation-skipping inheritances, and the like. If anything, it likely errs on the side of overstating the importance of inheritances.

5. Simulation results

Aggregate results

If the household sector were completely closed, there would be only two components in the accumulation of total household wealth: savings and the appreciation in value of existing wealth. Bequests and inheritances would net out to zero for the sector as a whole. Growth in mean household wealth would also depend on the increase in the number of households over time.

The 1962–83 simulation result for overall mean household wealth in 1983 is remarkably close to the actual mean. The simulated value is only 5 per cent greater than the actual mean. The discrepancy may be due to wealth transfers from the households sector to the government and non-profit sectors which are not accounted for in our model. The former occurs whenever estate or probate taxes are paid or when estates without heirs occur. Transfers to the non-profit sector are primarily made up of charitable gifts and bequests.

The results (last line of Panel A in Table 7) indicate that most of the increase in aggregate household wealth is made up of capital gains rather than savings from income, despite the fact that the model understates capital appreciation. For the 1962–83 period, capital gains on initial wealth account for 75 per cent of the average growth in household wealth, savings for 19

⁶ The earliest figures available for age of mother at birth are for those mothers born in 1891. For those in the analysis who were born earlier the figure for 1891 was used.

⁷ For two-parent households, no bequests occur because at the time of the husband (or wife's) death there is only a transfer of wealth to the cohort of the surviving spouse, determined by the average difference between husband's and wife's age. For single households, wealth is bequeathed to a child only if the household head is old enough to have a child 20 years of age or older. Otherwise, wealth stays within the cohort on the assumption that it is bequeathed to a sibling of roughly the same age. Different types of bequests occur simultaneously.

Table 7:
Sources of simulated wealth accumulation by birth cohort, 1962–83 and 1983–92^a

Age cohort (end of period)	Mean net worth (1000s, 1992\$)		Sources of wealth change (percentage) ^b				
	Start	End	Savings	Capital gains	Inheritance	Residual	Total
<i>A. 1962–1983</i>							
Under 25	–	12	0	0	13	87	100
25–29	–	31	0	0	15	85	100
30–34	–	65	–7	0	20	87	100
35–39	–	116	–6	0	21	85	100
40–44	1	144	13	6	27	54	100
45–49	24	324	9	13	23	55	100
50–54	58	231	34	34	49	–16	100
55–59	79	295	34	41	38	–13	100
60–64	105	315	40	48	37	–25	100
65–69	122	431	32	39	21	8	100
70–74	133	259	44	76	22	–42	100
75–79	227	211	47	151	14	–112	100
80+	167	170	38	160	6	–105	100
All	125	183	25	75			100
<i>B. 1983–1992</i>							
Under 25	0	16	–7	0	18	89	100
25–29	0	30	3	0	9	88	100
30–34	12	63	3	17	7	73	100
35–39	31	96	15	31	9	45	100
40–44	65	201	20	30	6	44	100
45–49	116	235	28	46	10	16	100
50–54	144	348	44	59	16	–20	100
55–59	324	374	32	85	18	–36	100
60–64	231	365	29	78	29	–37	100
65–69	295	346	20	74	51	–44	100
70–74	315	296	28	153	0	–81	100
75–79	431	271	15	191	0	–106	100
80+	221	232	3	186	0	–89	100
All	183	204	24	76			100

^aAll figures are in 1992 dollars. Calculations correct for the growth in the number of households over the periods. Ratios of simulated to actual mean wealth by age cohort are normalized so that the ratio of simulated to overall mean wealth is unity.

^bSavings include appreciation of assets accumulated in savings. Capital gains include appreciation of initial wealth only. Inheritance includes appreciation of assets acquired by bequest. The residual is the difference between the change of wealth of the birth cohort over the period and the sum of the first three components.

per cent, and capital gains on savings for another 6 per cent. Capital gains far outweigh savings in importance regardless of whether the gains on saving are treated as saving or as capital appreciation. Peek (1986) also found that capital gains were more important than saving over the period 1951–85, estimating that the ratio of capital gains to an expanded concept of saving including consumer durables was 1.32 over the period.

Results for the 1983–92 period are remarkably similar. The simulated value for overall average household wealth in 1992 is 6 per cent greater than the actual 1992 mean. Capital gains on initial wealth holdings in 1983 account for 76 per cent of the overall growth of wealth over this period, savings by themselves for 19 per cent, and capital gains on savings for another 5 per cent.

Inter vivos transfers

Considering next the pattern of wealth accumulation by age cohort, we are at once struck by a puzzle. In the 1962–83 simulation, simulated wealth is far lower than actual wealth for younger age cohorts, while the reverse is true for older cohorts (see Panel A of Table 7). For cohorts under the age of 40 in 1983, the simulation can account for at most 15 per cent of their average wealth. With a few exceptions, the residual (unity less the ratio of simulated to actual wealth) falls directly with age. Indeed, mean wealth is underestimated for cohorts below age 50 and overestimated for those above 50. A variety of factors may explain this pattern but I argue that *inter vivos* transfers from parents to children may be the most important. These were not included in the simulation model because there is insufficient information on these transfers at the microeconomic level to warrant even hypothesizing about them. Anecdotal evidence suggests that they are increasingly important in the United States, so that their omission could leave a large residual between simulated and actual wealth in exactly the direction which is found.

Results of the 1983–92 simulation are very similar to those of the 1962–83 simulation. We again see the same shortfall in simulated wealth for the younger age cohorts and the same overestimate for the older age cohorts. As in the 1962–83 simulation, age cohorts under the age of 50 appear to be net recipients of *inter vivos* transfers and those age 50 and over net donors. *Inter vivos* transfers appear to have accounted for over 70 per cent of the net worth of age cohorts under the age of 35 in 1992 and over 40 per cent for age cohorts 35–44.

One simple experiment might indicate why it is hard to account for the wealth of the younger age cohorts by savings (and the capital gains on these savings) alone. In 1983, the average wealth of age cohort 35–39 was \$116,000 in 1992 dollars. The present value of the income of this age group (from the time that they were age 20 and onward) was \$433,000 in 1992 dollars. If this group experienced the average rate of return on their household portfolio, then their annual savings rate would have to be 21 per cent for them to have achieved an average wealth of \$116,000 in 1983. A savings rate of 11 per cent would have resulted in an average wealth of only half its actual value. The actual savings rate of this age group on the basis of the CES data is less than 2 per cent (see Table 2).

An equally curious result is that the wealth of older age cohorts advances much less rapidly than the simulations would indicate. For example, the average wealth of age cohort 75–79 was \$211,000 in 1992, whereas its average wealth in 1962 (then age group 55–59) was \$227,000 in 1992 dollars – a reduction of \$16,000. On the basis of the average rate of return computed on the portfolio of this age cohort over this period, their wealth should have increased by \$152,000 without any additional savings, not declined by \$16,000! Where did their wealth go over the period? They would have to have an annual dis-saving rate of 16.3 per

cent in order to achieve the average wealth level of \$211,000 in 1992! According to the CES data, their savings rate averaged a hefty positive 4.1 per cent per year over this period, not a negative 16.3 per cent.

Another telling point is, as noted above, that the simulated mean household wealth in 1983 differed by only 5 per cent from the actual figure. Moreover, the simulation results also indicate that the total value of *inter vivos* transfers received by younger age cohorts differ by only 2.5 per cent from the total value of *inter vivos* transfers made by older ones in the 1962–83 simulation and by 3.1 per cent in the 1983–92 simulation. As a result, it does not appear that the age-specific savings rates and rates of return on wealth are too far off the mark, and it appears very likely that a substantial portion of the wealth of younger age groups must have come from transfers from older age groups.

What are other potential factors that might explain the difference between actual and simulated wealth by age cohort? There appear to be four other possibilities.

Age-related bias in the CES saving rates

Since the CES calculation of savings excludes housing expenditures (though it does include mortgage principal repayments), the reported savings of younger families may be understated relative to their actual level which should include housing repairs and improvements. Savings rates may be less biased for older families whose total savings reflect a higher proportion of financial savings relative to real estate (see Table 3).

A related factor is that if rates of return differ by age group (younger families buy riskier assets which happen to yield higher returns during the period in question) and I use the economy-wide average rate of return on each asset type for all age groups, the expected growth in wealth of the younger families in the simulation would be understated. Likewise, if younger households were more active investors, they could be adjusting their portfolios to changing asset yields more quickly than older households. However, as noted above, they appear to be more locked into owner-occupied housing with less possibility of responding to changing asset yields.

Patterns of household formation and dissolution

It should first be recalled that households are classified according to the age of the household head. As a result, savings accumulated by young adults living with their parents would be included in the wealth of their parents' (usually the father's) age cohort. When the young adult leaves the parents' household to form his or her own family, then part of his (or her) accumulated savings would be transferred to the age cohort of the young adult. However, if this were a major factor in accounting for the difference between simulated and actual wealth holdings by age cohort, then most of the "*inter vivos*" transfers should come from households in the age range of 45–60 (the average age difference between parent and child is about 25 years). However, age cohort 45–49 (in 1983) was a net recipient of *inter vivos* transfers and age cohorts 50–59 accounted for only 21 per cent of all *inter vivos* transfers given (see Table 8). Moreover, three-fourths of these transfers were received by age cohorts 35–49. As a result, it is unlikely that the establishment of new household units accounts for a large part of the residual between actual and simulated wealth observed for households under the age of 40.

A related phenomenon is that marriage increases mean household wealth by combining the assets of two formerly separate households while divorce, conversely, decreases mean wealth. As a result, marriage between young individuals and divorce among middle-aged

Table 8:
Mean savings and inheritances over the period by age cohort, 1962–83 and 1983–92^a

Age cohort (end of period)	Savings over period			Inheritances received over period			Inter-vivos transfers over period (inferred)		
	Cohort mean savings	Ratio to mean	Percentage share of total	Cohort mean inheritance	Ratio to mean	Percentage share of total	Mean <i>inter- vivos</i> trans.	Ratio to mean ^b	Percentage share of total ^c
<i>A. 1962–1983</i>									
Under 25	0	0.00	0.0	940	0.03	0.3	6,541	0.13	1.7
25–29	0	0.00	0.0	3,290	0.12	1.4	20,017	0.41	7.4
30–34	–3,183	–0.14	–1.5	8,717	0.32	3.5	43,119	0.89	15.1
35–39	–4,570	–0.20	–2.0	16,032	0.59	6.1	75,408	1.55	24.7
40–44	14,742	0.64	5.9	24,173	0.89	8.2	55,898	1.15	16.3
45–49	19,054	0.82	6.6	42,566	1.58	12.7	131,376	2.70	33.6
50–54	45,811	1.98	15.0	61,110	2.26	17.1	–44,402	0.48	–10.4
55–59	54,644	2.36	17.8	57,440	2.13	16.1	–48,046	0.52	–11.2
60–64	63,117	2.72	20.4	58,692	2.17	16.3	–83,352	0.91	–19.3
65–69	65,340	2.82	18.8	43,314	1.60	10.7	6,136	0.13	1.3
70–74	47,369	2.04	11.1	26,783	0.99	5.4	–105,251	1.15	–17.7
75–79	31,892	1.38	5.3	12,145	0.45	1.7	–211,527	2.30	–25.0
80+	18,937	0.82	2.7	3,990	0.15	0.5	–159,101	1.73	–16.3
Mean	23,169	1.00	100.0	27,020	1.00	100.0	0	0.00	0.0
Mean of positive values only:							48,573		
Mean of negative values only:							–91,797		

Table 8:
(Continued)

<i>B. 1983–1992</i>									
Under 25	–1,045	–0.05	–0.3	2,765	0.25	1.3	13,843	0.42	3.8
25–29	825	0.04	0.4	2,805	0.26	2.3	26,756	0.81	12.6
30–34	1,505	0.08	0.9	3,466	0.32	3.6	36,556	1.11	22.1
35–39	9,848	0.50	6.0	5,752	0.53	6.3	29,401	0.89	18.5
40–44	26,543	1.35	14.5	7,950	0.73	7.8	59,848	1.81	33.8
45–49	33,345	1.70	15.5	12,130	1.11	10.2	19,091	0.58	9.2
50–54	89,936	4.58	33.2	33,682	3.09	22.4	–40,071	0.96	–16.3
55–59	16,114	0.82	5.2	9,095	0.84	5.3	–17,852	0.43	–6.3
60–64	39,309	2.00	14.2	38,786	3.56	25.2	–49,140	1.18	–19.6
65–69	9,933	0.51	3.3	25,521	2.35	15.5	–22,294	0.53	–8.3
70–74	5,478	0.28	1.7	0	0.00	0.0	–15,814	0.38	–5.4
75–79	24,289	1.24	5.4	0	0.00	0.0	–169,125	4.05	–41.4
80+	358	0.02	0.1	0	0.00	0.0	–9,821	0.24	–2.7
Mean	19,635	1.00	100.0	10,883	1.00	100.0	0	0.00	0.0
Mean of positive values only:							33,047		
Mean of negative values only:							–41,776		

^aAll figures are in 1992 dollars. Calculations correct for the growth in the number of households over the periods. Ratios of simulated to actual mean wealth by age cohort are normalized so that the ratio of simulated to overall mean wealth is unity. Savings include appreciation of assets accumulated in savings. Inheritance includes appreciation of assets acquired by bequest.

^bThe ratio of positive values to the mean of positive values only and the ratio of negative values to the mean of negative values only.

^cFor positive values, the share of the total sum of positive values only; for negative values, the share of the total sum of negative values only.

couples (without remarriage) could result in a downward bias in the mean wealth of young households and an upward bias in the wealth of middle-aged households. However, simulations with actual marriage and divorce rates by age group and year failed to explain much of the discrepancy between the simulated and actual wealth holdings of young and middle-aged age groups. Moreover, it should be recalled that single male, single female, and married couples are treated separately in the simulation, and each year household accounts by these three family types are re-aligned to corresponding totals from the U.S. Bureau of the Census.

Generation-skipping in the bequest process

The simulated bequest process results in inheritances going to the cohort most likely to include the decedents' children. As shown in Table 8, over 70 per cent of simulated inheritances are transferred to age cohorts 45–69. The mortality rates of the parents of age groups under the age of 40 (their parents would be under the age of 65) are too low to account for much inheritance. However, when grandchildren inherit, this will raise the actual wealth of their cohort above their simulated wealth level (though it should also result in a corresponding decrease in ratio of actual to simulated wealth for the parental cohort, which is not observed here).

The correlation between mortality and wealth

As noted above, there is an inverse correlation between wealth and mortality rates. Since my simulation model does not include this effect, the simulated wealth of older households will actually be biased downward, not upward! As a result, this factor cannot account for the finding that simulated wealth is higher than actual wealth for older age cohorts (the correlation goes the wrong way!). Moreover, if the wealthy do live longer than the poor, then the simulated wealth bequests to younger households will, in fact, be higher in the simulations than in actuality – a result that will bias upward the wealth of younger households in the simulations.

In sum, it does not appear likely that the differences between simulated and observed wealth levels by age cohort can be adequately explained by factors other than *inter vivos* transfers. I therefore conclude that *inter vivos* transfers are accounting for a substantial part of the difference between actual and simulated wealth. The youngest cohorts (those under 40 in 1983 and those under 35 in 1992) can trace up to three-fourths or more of their wealth to such transfers. Cohorts between age 40 and 49 in 1983 and between 35 and 44 in 1992 can trace about half. I estimate that cohorts aged 50–64 in 1983 and 50–54 in 1992 have given away as much as 20 per cent of their wealth, those 70–74 in 1983 and 55–69 in 1992 about 40 per cent, and those 75 and over in 1983 and 70 and over in 1992 had transferred half their net worth in advance of death. Moreover, as shown in Table 8, half of these transfers are received by age cohort 40–49 in 1992 and the peak age of receipt is age cohort 40–44 (80 per cent greater than the mean value of *inter vivos* transfers received). Moreover, over three-quarters of the transfers are made by age cohorts 60 and over.

Savings

As shown in Table 7, savings (including appreciation) exceed one-third of the simulated growth in cohort wealth for age cohorts 50 and over in 1983 in the 1962–83 simulations. For age cohorts under 40, savings account for virtually nothing in terms of their wealth accumulation over these years and for age cohort 40–49 about 10 per cent. Indeed, peak

savings occur among cohorts ranging in age from 50 to 74 (in 1983) and these cohorts collectively account for 83 per cent of all household savings over this period (see Table 8). Here, again, it is clear that savings can explain no more than a tiny fraction of the wealth accumulation of age cohorts under the age of 50.

Results are similar for the 1983–92 period. Savings accounts for about a third of the wealth accumulation of age cohorts 45 to 74 over this period (Table 7). It amounts to 15–20 per cent for age cohorts 35–44 and age cohort 75–79 and for a trivial amount for age cohorts under 35 and over 80. The peak savings years are 40 to 64 (in 1992) and these cohorts collectively account for 83 per cent of all household savings.

Capital gains

Appreciation of initial asset holdings as a source of wealth growth is, not surprisingly, more important for older age cohorts than younger ones, since older cohorts have higher initial wealth (Table 7). Capital gains as a proportion of the growth in net worth rises almost monotonically from the youngest to oldest cohort in both simulations. For age cohorts 70–74 in 1983 and 50–69 in 1992, over three-quarters of their wealth growth over the period could be attributed to capital gains alone. Moreover, for age cohorts 75 and over in 1983 and 70 and over in 1992, capital gains alone explain more than 100 per cent of the change in their net worth. Almost three-quarters of all capital gains were received by age cohorts 55–79 over the 1962–83 period and almost three-quarters by age cohort 50–79 over the 1983–92 period.

Inheritances

The amount of inheritance a household receives depends on two factors: (i) the age of their parents, and (ii) the wealth of their parents. While wealth levels generally peak for households in their 60s, mortality rates are under 2 per cent for individuals aged 65, reach 4 per cent at age 75 and 6 per cent at age 80. Since the average age difference between parent and child is about 25 years, the primary recipients of bequests are age cohorts 45–69 (see Table 8). Indeed, in the 1962–83 simulation, these cohorts accounted for about three-quarters of all inheritances received and in the 1983–92 simulation, close to 80 per cent.

As a result, inheritances account for a much higher share of the growth of wealth for middle-age groups than either younger or older ones. In the 1962–83 simulation, inheritances as a share of the change in net worth increase almost monotonically with age until ages 50–54 and then decline with age. In the 1983–92 simulation, the share increases with age until ages 65–69 and then declines. At the peak age groups in the two simulations, inheritances amount to about half of the total increase in the age group's wealth over the period. One reason why the peak age group is older in the later simulation is that longevity has been rising over time. For males life expectancy rose from 66.8 years in 1962 to 67.6 in 1973, 71.0 in 1983, and 72.3 in 1992. For females, the corresponding figures are 73.4, 75.3, 78.1, and 79.1.

Lifetime accumulation of wealth

One final experiment was undertaken to examine the sources of the lifetime accumulation of wealth. There are three sources in this case: savings, *inter vivos* transfers, and inheritances. The analysis is based on the birth cohort 1942–46. I begin with age cohort 20–24 in 1962 (40–44 in 1983). On the basis of the results of the 1962–83 simulation, I can estimate the sources of its wealth accumulation through 1983. For the 1983–92 period, I can

use the results of this simulation for age cohort 50–54 (in 1992) for this period. For future years, I must project savings rates by age group, rates of return by asset type, and inheritance patterns by age group. For savings rates, I use the average savings rate by age group, where the average is computed over the entire 1962–92 period. For rates of return, I again use their average value over the 1962–92 period. Inheritances are simulated on the basis of 1992 mortality tables and an average age difference between mother and child of 25 years. It is also assumed that no *inter vivos* transfers are given to other households by birth cohort 1942–46.

Results of this experiment are shown in Table 9. Between ages 20–24 and 40–44, *inter vivos* transfers account for over half of all wealth accumulated over these two decades and inheritances for over a quarter. Savings comprise only 14 per cent. However, by the time these households are in their early 50s, savings becomes increasingly important and it cumulatively accounts for one third of total household wealth accumulation up to that point. Since *inter vivos* transfers are relatively small for families in their 50s, this component falls to 39 per cent of total household wealth. Inheritances remain at 28 per cent.

Over the next decade, families save at a high rate (7 to 8 per cent of income) but also receive a substantial amount of inheritances. However, compared to the wealth accumulated up to this point, the new additions are relatively small. As a result, savings rise from 33 to 35 per cent of their cumulative wealth accumulation and inheritance from 28 to 31 per cent, and *inter vivos* transfers fall from 39 to 34 per cent.

Table 9:
Sources of the lifetime accumulation of wealth for birth cohort 1942–46 over the period 1962–2022^a

Year	Ages	Mean net worth ^c (’000s, 1992\$)	Cumulative sources of wealth change (percentage) ^b				Source
			Savings	<i>Inter vivos</i>	Inheritance	Total	
1962	20–24	0	0	0	0	0	
1983	40–44	144	14	57	28	100	1962–83 Simul.
1992	50–54	388	33	39	28	100	1983–92 Simul.
2002	60–64	571	35	34	31	100	Projected ^d
2012	70–74	606	36	33	31	100	Projected ^d
2022	80–84	627	36	33	31	100	Projected ^d

^aAll figures are in 1992 dollars. Calculations correct for the growth in the number of households over the periods.

^bSavings include appreciation of assets accumulated in savings. Inheritance includes appreciation of assets acquired by bequest. *Inter vivos* transfers include the appreciation of assets acquired through such transfers.

^cAssumes that no *inter vivos* transfers are given to other households.

^dSavings rate by age cohort are averaged over the 1962–92 period. Rates of return by asset type are averaged over the 1962–92 period. Inheritances are simulated on the basis of 1992 mortality tables and an average age difference between mother and child of 25 years.

6. Concluding remarks

Three major findings are reported in this paper. First, savings, in the conventional (NIPA) sense of income less consumption expenditures, account for only about one-fourth of aggregate household wealth accumulation, while capital gains on existing wealth provide the other three-quarters. However, even this large capital gain effect may be understated. The reason is that portfolio effects include passive and active responses. A household may have a greater share of wealth in, say, real estate in a later year than an earlier one because the value of its real estate rose at a more rapid rate than the value of other assets or because it shifted resources toward that asset. Households whose portfolios are oriented toward assets which experience substantial capital gains and/or produce higher income flows will experience more rapid wealth accumulation *ceteris paribus* than those whose assets are concentrated in slow growth areas. I expect that the simulation model understates the appreciation component in wealth accumulation, because it does not capture the active portfolio effect. In spite of this understatement, capital gains are by far the most important contributor to growth in real wealth.

Second, the simulations systematically fall short in explaining the mean wealth of younger age groups but systematically overstate that of older ones. I surmise that *inter-vivos* transfers explain this discrepancy and are the major source of wealth accumulation for younger age groups, particularly under the age of 50.

Third, the simulations for birth cohort 1942–46 suggest that inheritance alone contributes about one-third to the overall growth in their wealth over their lifetime, while *inter vivos* transfers account for another third and savings for the remaining third. *Inter vivos* transfers by themselves are the source of over half of household wealth until age 50. Savings make their major contribution to wealth accumulation between ages 40 to 65, while inheritances come into play mainly between ages 45 and 69. Over the lifetime, two-thirds of the growth in household wealth is accounted for by intergenerational transfers.

REFERENCES

- ANDO, A. and MODIGLIANI, F., 1963, "The Life Cycle Hypothesis of Saving: Aggregate Implications and Tests", *American Economic Review*, 53, pp. 55–84.
- EVERY, R., ELLIHAUSEN, G., CANNER, G.B. and GUSTAFSON, T.A., 1984, "Survey of Consumer Finances, 1983", *Federal Reserve Bulletin*, pp. 679–692.
- BLINDER, A., 1988, "Comments on Franco Modigliani's 'Measuring the Contribution of Intergenerational Transfers to Total Wealth'", in Kessler, D. and Masson, A. (eds.), *Modelling the Accumulation and Distribution of Wealth*, Oxford University Press, Oxford, pp. 68–76.
- CURTIN, R.T., JUSTER, F.T. and MORGAN, J.N., 1989, "Survey Estimates of Wealth: An Assessment of Quality", in Lipsey, R. and Tice H. (eds.), *The Measurement of Saving, Investment, and Wealth*, Studies of Income and Wealth, 52, Chicago University Press, pp. 473–548.
- GREENWOOD, D.T., 1983, "An Estimation of Family Wealth and Its Distribution from Microdata, 1973", *Review of Income and Wealth*, 29, pp. 23–44.
- GREENWOOD, D.T. and WOLFF, E.N., 1988, "Relative Wealth Holdings of Children and the Elderly in the United States", in Palmer, J.L., Smeeding, T. and Torrey, B.B. (eds.), *The Vulnerable*, Urban Institute Press, Washington, D.C., pp. 123–148.
- GREENWOOD, D.T. and WOLFF, E.N., 1992, "Changes in Wealth in the United States, 1962–1983: Savings, Capital Gains, Inheritance, and Lifetime Transfers", *Journal of Population Economics*, 5, pp. 261–288.
- JIANAKOPOLOS, N.A., MENCHIK, P.L. and IRVINE, F.O., 1989, "Using Panel Data to Assess the Bias in Cross-Sectional Inferences of Life-Cycle Changes in the Level and Composition of Household Wealth", in Lipsey, R.E. and Tice, H.S. (eds.), *The Measurement of Saving, Investment, and Wealth*, Studies in Income and Wealth, 52, University of Chicago Press, Chicago, pp. 553–644.

- KENNICKELL, A.B. and STARR-MCCLUER, M., 1994, "Changes in Family Finances from 1989 to 1992: Evidence from the Survey of Consumer Finances", *Federal Reserve Bulletin*, 80, pp. 861–882.
- KESSLER, D. and MASSON, A., 1989, "Bequests and Wealth Accumulation: Are Some Pieces of the Puzzle Missing?", *Journal of Economic Perspectives*, 3, pp. 141–152.
- KOTLIKOFF, L., 1988, "Intergenerational Transfers and Savings", *The Journal of Economic Perspectives*, 2, pp. 41–58.
- KOTLIKOFF, L. and SUMMERS, L.H., 1981, "The Role of Intergenerational Transfers in Aggregate Capital Accumulation," *Journal of Political Economy*, 89, pp. 706–732.
- LAITNER, J. and JUSTER, F.T., 1996, "New Evidence on Altruism: A Study of TIAA-CREF Retirees", *American Economic Review*, 84, pp. 893–908.
- MASSON, A., 1986, "A Cohort Analysis of Age–Wealth Profiles Generated by a Simulation Model of France (1949–1975)", *Economic Journal*, 96, pp. 173–190.
- MENCHIK, P.L. and DAVID, M., 1983, "Income Distribution, Lifetime Savings, and Bequests," *American Economic Review*, 83, pp. 672–690.
- MODIGLIANI, F., 1988, "The Role of Intergenerational Transfers and Life Cycle Savings in the Accumulation of Wealth", *Journal of Economic Perspectives*, 2, pp. 15–40.
- MODIGLIANI, F. and BRUMBERG, R., 1954, "Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data", in Kurihara, K. (ed.), *Post-Keynesian Economics*, Rutgers University Press, New Brunswick, N.J.
- PEEK, J., 1986, "Household Wealth Composition: The Impact of Capital Gains", *New England Economic Review*, pp. 26–39.
- PROJECTOR, D. and WEISS, G., 1966, "Survey of Financial Characteristics of Consumers", *Federal Reserve Technical Papers*, Washington, D.C.
- SHORROCKS, A.F., 1975, "The Age–Wealth Relationship: A Cross-Section and Cohort Analysis", *Review of Economics and Statistics*, 57, pp. 155–163.
- WILHELM, M.O., 1996, "Bequest Behavior and the Effect of Heirs' Earnings: Testing the Altruistic Model of Bequests", *American Economic Review*, 84, pp. 874–892.
- WOLFF, E.N., 1987, "Estimates of Household Wealth Inequality in the United States, 1962–83", *Review of Income and Wealth*, 33, pp. 231–256.
- WOLFF, E.N., 1988, "Social Security, Pensions, and the Life Cycle Accumulation of Wealth: Some Empirical Tests", *Annales d'Economie et de Statistique*, 9, pp. 199–226.
- WOLFF, E.N., 1996, *TOP HEAVY: A Study of Increasing Inequality of Wealth in America*, updated and expanded edition, The New Press, New York.
- WOLFF, E.N. (forthcoming), "The Size Distribution of Wealth in the United States: A Comparison among Recent Household Surveys", in Willis, R. and Smith, J.D. (eds.), *Wealth, Work, and Health: Innovations in Measurement in the Social Sciences*, University of Michigan Press, Ann Arbor, MI.
- WOLFSON, M.C., 1980, "The Bequest Process and the Causes of Inequality in the Distribution of Wealth", in Smith, J.D. (ed.), *Modelling the Distribution and Intergenerational Transmission of Wealth*, Studies in Income and Wealth 46, University of Chicago Press, Chicago, pp. 187–222.