

Bequests and Aggregate Wealth Accumulation in Germany*

by Anette Reil-Held**

This paper estimates the proportion of current wealth in Germany which is generated by intergenerational bequests. It begins with the flow-of-bequests approach which cumulates annual flows of bequests into a stock of transfer wealth. Assuming exponential growth of the economy, inherited wealth accounts for about 35 per cent of total wealth in Germany, a figure comparable to that obtained for other countries. However, the assumptions underlying this estimate are inappropriate for Germany, because they fail to take account of the special circumstances of the postwar period. Modifying the flow-of-bequests method to allow for these special circumstances reduces the share of inherited wealth to about 10 per cent, surprisingly low in comparison to other countries.

To confirm this result, a further method was developed based on a regression model of wealth as a function of socio-economic variables. The wealth of the nation is estimated with bequests included, and the contribution of bequests is then calculated by setting bequests equal to zero. This result again produces a share of about 10 per cent for inherited wealth, making this figure the most plausible value for Germany in the 1980s. However, the share can be expected to increase in future.

1. Introduction

This paper is concerned with the determinants of private wealth, and, more especially, with the relative importance of inheritances *vis-à-vis* life-cycle savings. A significant contribution of intergenerational transfers compared to life-cycle savings has a number of economic implications concerning, for instance, the effects of public debt or public transfer programmes (Barro, 1974; Cox and Jakubson, 1995), the distribution of wealth (Atkinson, 1982), and the design of the tax structure. Despite of the importance of the topic, however, past research has not provided a clear understanding of the role and significance of inheritances. Indeed, assessments vary widely.

The article by Kotlikoff and Summers (1981) started a controversial debate, especially with Modigliani (1988a, 1988b). Prior to the publication of this article, it was commonly believed that most private wealth was due to life-cycle savings, and relatively little to intergenerational transfers – no more than about 20 per cent according to some estimates (Modigliani, 1988b; Kessler and Masson, 1989). However, using new methods applied to new data, Kotlikoff and Summers claimed that life-cycle savings may represent only 20 per cent of private wealth, leaving 80 per cent to be explained by intergenerational transfers.

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Kotlikoff and Summers (1981, 1988a, 1988b) used two different methods in their analysis. First, they estimated the magnitude of intergenerational transfers in an indirect way, by considering the difference between earnings and consumption of the different cohorts, and calculating the aggregate present value of life-cycle savings. Transfer wealth was then obtained by subtracting life-cycle savings from total private wealth.

The second approach adopted by Kotlikoff and Summers makes use of direct evidence on intergenerational transfers, and has become known as the “Flow of Bequests” (FoB) method. They transform a yearly flow of bequests into a stock of transfer wealth by assuming a constant growth rate of transfer growth, and by imputing values to several parameters such as the age gap between donors and recipients. This approach yields a figure of about 52 per cent for the share of transfer wealth. Kotlikoff and Summers prefer their first method because it does not rely on the quality of survey data.

In a critical reply, Modigliani (1988a, 1988b) reduces the share of transfer wealth to 20 per cent by correcting and reinterpreting definitions. His main criticisms were that: (1) the FoB formula relating the flow of transfers to the stock of transfer wealth includes a mathematical mistake; (2) the age gap assumed between donors and recipients is too high (Modigliani suggests 25 years instead of the 30 years used by Kotlikoff and Summers); (3) bequests should not be capitalized, because only the transfers, and not the interest on these transfers, should be counted as transfer wealth; (4) expenditure on consumer durables should be counted as saving rather than consumption. For a summary and comments about the debate, see Blinder (1988) and Kessler and Masson (1989).¹

The debate between Modigliani and Kotlikoff and Summers stimulated further empirical research into the importance of intergenerational transfers: for a review, see Kessler and Masson (1989) and Guiso and Jappelli (1995). However, the discussion about the share of transfer wealth is still ongoing. Three different approaches are taken. In addition to the Flow of Bequest method with its underlying steady-state assumptions (e.g., Gale and Scholz, 1995; Guiso and Jappelli, 1995), a variety of overlapping generations simulation models have been applied (e.g., Davies, 1982 and Davies and St. Hilaire, 1987; Masson, 1986). The third approach uses survey data which contain direct information on intergenerational transfers (e.g., Hurd and Mundaca, 1989 and Guiso and Jappelli, 1995). Table 1 summarizes the results of some of the most recent studies.

The remainder of this paper assesses the share of private wealth in Germany which can be attributed to intergenerationally inherited bequests. Three different approaches are applied to two different data sets. First, in section 2, the share of transfer wealth is estimated using the FoB method of Kotlikoff and Summers (1981). The results suggest that bequest wealth contributes about 35 per cent of current wealth. This figure is similar to that found for other countries. However, on closer inspection the underlying steady-state assumptions do not seem appropriate for Germany. Therefore, section 3 presents a more detailed specification of the FoB method which takes account of the specific situation in post-war Germany. This approach yields a much lower share of bequest

¹ Neither of the positions seems to be totally correct. In the words of Kessler and Masson (1989), “The different approaches proposed, and especially the share of already inherited wealth, suffer from a problem of circularity: the measure depends closely upon each author’s prior belief concerning the true model of accumulation. Moreover, methods of estimation of the share of bequest are likely to lead to biased estimates because they focus on average behaviour in a steady state framework for the accumulation and distribution of total net worth” (p. 150).

Table 1:
Studies concerning the share of transfer wealth in total wealth

Author	Country	Method	Share of transfer wealth	
			Without interest	Capitalized
Kotlikoff and Summers (1981)	USA	FoB Difference between wealth and calculated life-cycle savings	40%	52% (Intergenerational transfers) at least 80%
Kotlikoff and Summers (1981) and own calculations ^a	USA	FoB	–	26.3% (Bequests only)
Modigliani (1988)	USA	FoB and evaluation of survey data	<i>c.</i> 20%	–
Hurd and Mundaca (1989)	USA	Evaluation of survey data	11% (Bequests) 4% (Transfers <i>inter vivos</i>)	20% (Bequests) 8% (Transfers <i>inter vivos</i>)
Davies and St. Hilaire (1987)	Canada	Simulation	35% (Bequests)	53% (Bequests)
Kessler and Masson (1979, 1989)	France	Evaluation of survey data	35% (Bequests)	46% (Bequests)
Masson (1986)	France	Simulation	40% (Bequests)	50–55% (Bequests)
Gale and Scholz (1994)	USA	FoB		31% (Bequests) 20% (Gifts)
Guiso and Jappelli (1995)	Italy	Evaluation of survey data	20.2% (Bequests) 4.1% (Transfers <i>inter vivos</i>)	29.5% (Bequests) 6.3% (Transfers <i>inter vivos</i>)
Own results	Germany	FoB Modified FoB simulation	24–25% (Bequests)	35% (Bequests) 9–12% (Bequests) 9% (Bequests)

^aThe flow of transfers used by Kotlikoff and Summers includes, apart from bequests (\$26.4 billion), also life insurance (\$2.5 billion), trust contributions (\$6.2 billion) and college expenses (\$10.3 billion). For the purpose of this paper the share of transfer (bequest) wealth was calculated with bequests only.

wealth: about 10 per cent. Section 4 takes a totally different approach by setting up a regression model for the wealth of individual households which includes bequest variables. This approach again yields a figure of about 10 per cent for the share of intergenerationally inherited wealth. However, a higher proportion can be expected in future, because this low value seems to be a consequence of World Wars I and II, and the unstable situation in the interwar period.

The Data

This paper uses two micro data sets, the Socio-Economic Panel (SOEP) conducted by the Deutsches Institut für Wirtschaftsforschung (DIW) and the Income and Consumption Survey (*Einkommens- und Verbrauchsstichprobe*, EVS) by the Statistisches Bundesamt.²

The SOEP was started in 1984. Once a year about 6,000 households (containing approximately 12,000 persons) are asked to give details about their working life, income and transfers, housing situation, schooling, health, satisfaction with different aspects of life and values. The 1988 wave of the SOEP contains a special one-off questionnaire about household wealth, which includes questions about bequests. The households were asked if, when and what kind of wealth (housing equity, cash or bonds) had been received by any household members in the period from 1960 to 1987. In total 511 households (about 15 per cent of the sample) reported a bequest. The mean value of the inheritances received by the interviewees was DM 101,350 (in 1985 prices).³ Figure 1 shows the distribution of the inherited amounts.⁴ This corresponds to an aggregate of about DM 360 billion (in 1985 prices) for the total population. For a detailed descriptive analysis of the SOEP data on bequests, see Schlomann (1991).

The Income and Consumption survey (EVS) is conducted once every five years, asking more than 40,000 households for details about their income and wealth, as well as their consumption. Unfortunately, the EVS does not include direct information about bequests which could be compared immediately with the SOEP. Households are asked in a much broader sense if they received a one-off financial transfer from other private households.⁵ This was reported by 5.8 per cent of the households in the year 1988, the average transfer value being DM 11,984.⁶ However, the EVS provides valuable information which allows the total amount of bequests that are left per year to be estimated in an indirect way. The bequests for the year 1988 are calculated by using information about wealth, family status and mortality rates of the households. For every household head aged 45 or older, the expected value of a bequest that he or she leaves in 1988 is calculated as the product of household wealth and the sex- and age-specific mortality rates. The expected bequest values are then added to get the total, which is about DM 54 billion. This figure can be compared with the bequests reported in the SOEP for the year 1987, which total about DM 33 billion.

2. Calculating transfer wealth using the flow of bequest approach

The FoB method

To estimate the share of transfer wealth using the FoB method of Kotlikoff and Summers (1981), an annual flow of bequests (which is to be determined in first place) is transformed into

² Unfortunately, German data about bequests cannot be compared with official/public statistics as these are not published in meaningful detail.

³ The paper evaluates only sample 1 of the SOEP, which includes only households with a German household head.

⁴ For the households who reported an inheritance, but not its value, the average value of the reported inheritances was taken.

⁵ One-off and irregular transfers from other private households include, for instance, divorce settlements, cash wedding presents, bequests and gifts.

⁶ Comparing the SOEP-data to the EVS for the single year 1987, we find 1.7 per cent of households who reported bequests and an average value of DM 82,307. Unlike the EVS, the SOEP includes inherited housing wealth as well as financial bequests. Financial bequests alone are about DM 13 billion, which is the same order of magnitude as the more broadly defined transfers in the EVS.

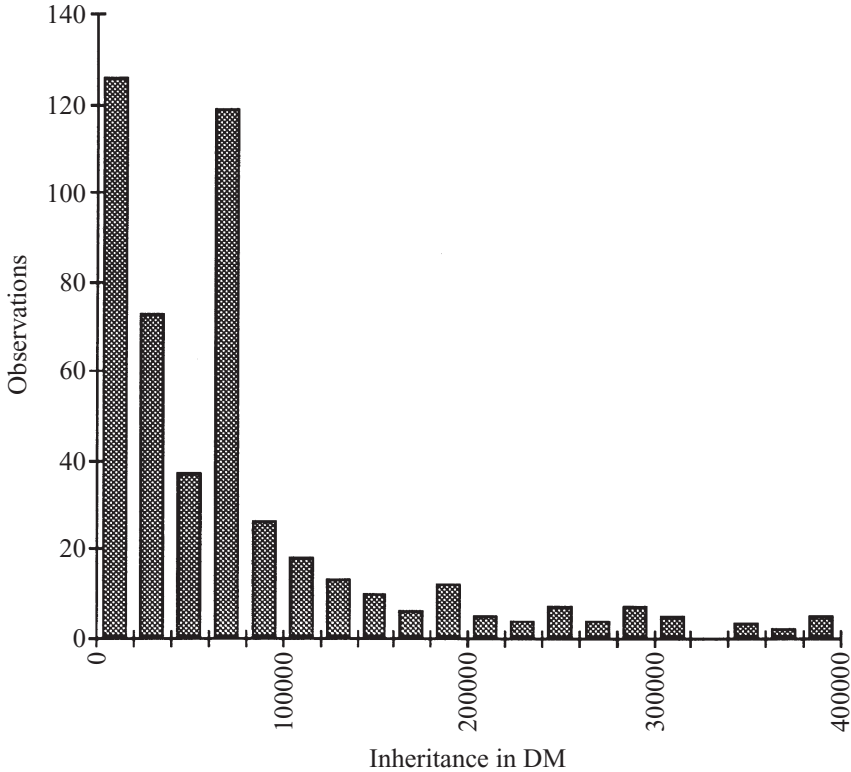


Figure 1: Distribution of inheritances in the socio-economic panel

the corresponding stock of transfer wealth. This requires some initial assumptions concerning the growth rate of the economy and various parameter values, for instance the average age gap between donors and recipients.

In the model of Kotlikoff and Summers, all individuals receive one intergenerational transfer of equal amount at age I , give a transfer at age G , and die at age D . The yearly flow of transfers t grows with a constant rate n (population plus productivity growth), and the interest rate is r . The stock of transfer wealth T at a given point in time equals the total of all transfers received by living individuals minus the total of all transfers given by them:

$$T = \int_t^D te^{(x-I)(r-n)} dx - \int_G^D te^{(x-G)(r-n)} dx. \quad (1)$$

The first term in equation (1) represents the transfer that each individual receives at age I . An individual at age $I + x$ received x years ago an intergenerational transfer of te^{-nx} . This transfer bears an interest rate r , which means that the yearly flow of transfers is now worth $te^{(r-n)x}$. The second term shows that every individual makes one transfer at age G . An individual at age $G + x$ paid x years ago an amount te^{-nx} . This is now worth $te^{(r-n)x}$. Integrating equation (1) yields:

$$T = t \frac{e^{(r-n)(D-I)}}{r-n} (1 - e^{(r-n)(G-I)}). \quad (2)$$

This paper considers only inheritances, excluding transfers *inter vivos*, which means that D equals G . In this case equation (2) simplifies to

$$T = \frac{t}{r-n} (e^{(r-n)(G-I)} - 1). \quad (3)$$

Application of the FoB method to Germany

The model presented above will now be used to evaluate data for Germany.⁷ Two different inputs will be used to estimate the yearly transfer flow t . First, we take the aggregate of the inheritances of about DM 33 billion reported in the SOEP for 1987.⁸ The age of the donors, G , is 73.65 in accordance with the *Sterbetafel 1970/72*.⁹ The average age of the recipients, I , is 42.4 years (age of the head of household) in the SOEP sample. The resulting age gap between donors and recipients is therefore 31 years. For the productivity growth a value of 1.4% per year is used for n .¹⁰ Average population growth in Germany between 1960 and 1988 was 0.31%,¹¹ which makes the sum of productivity and population growth equal to 1.71%. The real interest rate $r = 2.39\%$ is calculated as the difference between the return on capital of long-term savings and the inflation rate between 1968 and 1988.

Results

Inserting the values given above into equation (3), the stock of transfer wealth in Germany is estimated to be about DM 1,153 billion in 1988. In relation to the total private wealth of DM 3,141 billion as taken from the SOEP, the share of transfer wealth is 36.7 per cent.¹² Thus application of the original FoB method to Germany produces a result which is similar to that obtained for other countries (see Table 1).

To check this result, the calculation was performed a second time using the estimated flow of bequests from the 1988 EVS. The input value is now DM 53.9 billion, which was calculated indirectly as described above. This alternative figure yields an estimated transfer wealth of DM 1,883 billion, equivalent to 34 per cent of the aggregated total wealth of DM

⁷ Kotlikoff and Summers (1981) use the following parameter values for the U.S.: $D = 55$, $G = 45$, $I = 15$ (years over 18), $r - n = 0.1$, $n = 1.4\%$ (population growth) + 2.2% (productivity growth). On the basis of a yearly flow of transfers about \$45.4 billion in 1974, which includes bequests, financial support during college, life insurances and trust contributions, they estimate transfer wealth to be \$1755 billion, which equates to a 45 per cent share of total wealth.

⁸ For those households who said that they received an inheritance in 1987 but did not give the amount, the average value of inheritances was used. If those households are omitted, the total amount of bequests would be DM 28 billion.

⁹ This age was calculated from the average expected lifespan of men and women aged 30. Source: Institut der deutschen Wirtschaft (Hrsg.), *Zahlen zur wirtschaftlichen Entwicklung der Bundesrepublik Deutschland 1989*, Table 3.

¹⁰ Börsch-Supan (1993): estimated for 1978–1990 using national accounts data (DIW).

¹¹ Own calculation based on *Statistisches Jahrbuch (1990)*, p. 676.

¹² The transfer wealth of 1987 has to be related to the total wealth in 1988, because the SOEP contained data on wealth only for that year.

5500 billion in the 1988 EVS. This is surprisingly similar to the figure obtained using the SOEP data.¹³

The treatment of accumulated interest

In the above results, transfers have been capitalized using the interest rate r in equations (1) to (3). This accords with the practice of Kotlikoff and Summers (1981). However, the capitalization of the transfer flow is controversial. Modigliani argues that capital income should be considered as current income, not as a transfer.¹⁴ As Blinder (1988) puts it, the problem is that the two types of wealth accumulation – inherited wealth and life-cycle savings – interact. This makes a pure accounting breakdown impossible, because inheritances affect life-cycle savings. Only a behavioural economic model can perform the necessary breakdown, by answering the counterfactual economic question about how large wealth would be if there were no inheritance. Blinder shows in an example that the Kotlikoff/Summers calculation is correct if inheritances do not change either consumption or labour earnings of an individual. But if lifetime consumption habits change after an inheritance, and the individual consumes the inheritance, then Modigliani is right. This controversy cannot be decided, therefore, without econometric evidence about behavioural responses which is not currently available (Blinder, 1988; Kessler and Masson, 1989).

To get a feeling for the consequences of the two different interpretations, the share of inherited wealth was also computed without interest on transfers. This yields an estimate of the share of transfer wealth of 25.5 per cent using the SOEP and 23.8 per cent using the EVS data.

3. Modifying the FoB method to allow for the circumstances of post-war Germany

It is questionable whether the model of Kotlikoff and Summers can be applied to Germany without modification, because of the special circumstances of the post-war period. The assumption of exponential growth of the flow of transfers appears particularly doubtful. The high number of deaths during the war changed the age structure, and therefore the number of bequests. In addition, much poverty existed, which made a huge transfer flow unlikely. Figure 2 shows the time path of GDP, private savings and inheritance taxes in Germany. All the graphs suggest that special conditions prevailed in Germany between 1950 and 1970.

This pattern of economic development can be taken into account by avoiding some of the assumptions of the original FoB-approach. The assumption of exponential growth can be replaced by a more detailed model because of the existence of data on the annual transfer flow t . To explore the implications of this data, the annual transfer flow t must be modelled as a function $t(y)$ of the calendar year y . For that purpose the initial assumption $t = t_0 e^{rx}$ needs to be replaced in equation (1) by the general expression $t = t(y)$, in which y denotes the calendar year of the transfer. The resulting integral

¹³ The correspondence between the shares of transfer wealth in the SOEP and EVS data might indicate that bequests and wealth are under-reported to the same extent in the SOEP.

¹⁴ In his comment Blinder (1988, p. 71) illustrates the different points of view with the “Rockefeller” example: “John D. Rockefeller II never earned a penny of labour income, but had a very large flow of property income – so large, in fact, that he was a net saver over his lifetime. Modigliani wants to say that Rockefeller was a life-cycle accumulator. Kotlikoff and Summers want to say he was a pure inheritor.”

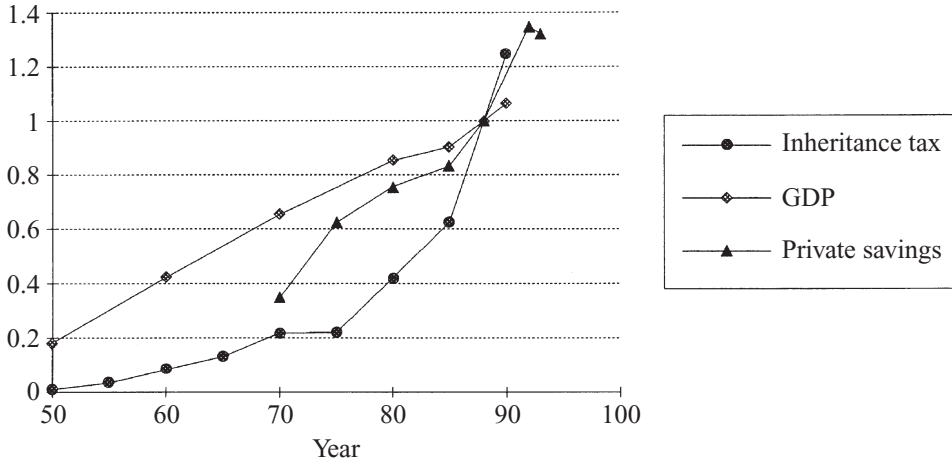


Figure 2: GDP (in 1991 prices), inheritance taxes and private savings in Germany in relation to 1988 as the year of reference^a

^aA reform of the inheritance tax took place in 1974. The impact would need further investigation. Sources: Inheritance tax, see Heuser (1994), p.17; GDP and Private Savings, see Institut der Deutschen Wirtschaft (1990).

$$T = \int_t^D t(y) e^{(x-I)} dx - \int_G^D t(y) e^{(x-G)} dx \tag{4}$$

now needs to be solved numerically. In order to take a snapshot of a given population in a reference year y_0 we have to relate the age x of every individual with $I < x < G$ to the year y , in which he or she received the bequest. This is done easily by working out the sum

$$y(x) = y_0 - (x - I).$$

If we set $I = 21$, say, and define the reference year $y_0 = 1987$, then somebody who is $x = 25$ years old today must have received his/her bequest in 1983. If we again set $D = G$, and replace the integrals with sums to simplify the equations, we obtain:

$$T = \sum_{x=I}^D t(y_0 - (x - I))e^{(x-I)r} - t(y_0). \tag{5}$$

Two different approaches are used below to estimate the yearly transfer flow $t(y)$. The SOEP sample is used to extract the annual flow of bequests t for the years between 1960 and 1987. To even out the low number of cases in some years, it is calculated as an average value of three to five subsequent years. Inserting these values for $t(y)$ into equation (5) yields a share of transfer wealth of only 8.5 per cent, much lower than in the original FoB method.¹⁵

¹⁵ The transfer wealth T of the sample is DM 38.6 billion; total sample wealth W equals DM 455.7 billion.

This result can be checked using a different approach based on annual inheritance tax data. The underlying assumption is that the amount of inheritance tax is roughly proportionate to the flow of transfers. Specifically, we assume that the annual flow of transfers is given by:

$$t(y) = t_0 \frac{tax(y)}{tax(y_0)}.$$

In this formula t_0 represents the flow of transfers in the reference year y_0 , and $tax(y)$ denotes the revenue of inheritance tax in year y . Using again the estimate of DM 53.9 billion for aggregate inheritances t_0 based on the 1988 EVS (see above), and considering data on inheritance tax for the period 1950 to 1988, we obtain a stock of transfer wealth of DM 667.6 billion in 1988. That implies that the share of transfer wealth is about 12 per cent,^{16,17} which is in line with the previous result based on annual SOEP bequest data. Thus, although the two modified versions of the original FoB method use different datasets and models, the result is always a share of transfer wealth which is relatively low in comparison to other countries.

4. Estimation of transfer wealth using regression techniques

To cross check the results obtained in sections 2 and 3, a completely different approach was used to estimate the contribution of bequests to private wealth accumulation. Starting with the SOEP micro-data, a general “black box” model was constructed to account for the wealth of each household in terms of its socio-demographic characteristics. This model includes details of bequests, namely the date and amount of the inheritances received. The parameters of this model are then estimated from the SOEP data and used to calculate the aggregated wealth of the nation. The next step is to set all inheritances to zero in order to calculate the value of aggregate wealth in the absence of bequests. The difference between the two figures for aggregate wealth provides a rough estimate of the contribution of bequests to total wealth.

This approach is motivated by the idea that if a dataset contained complete information about the amount and timing of inheritances, and the value of total wealth, then the share of transfer wealth could be estimated by simply dividing the total amount of inheritances by total wealth. However, this simple approach neglects any behavioural responses by households, the assumption being that inheritances and total wealth are unaffected. The regression technique described above has the advantage of taking account of reactions to the receipt of inheritances. This is possible because controlling for household characteristics in the initial regression model allows comparisons to be made between households which differ only with respect to inheritances. It is therefore possible to answer the question which is fundamental to understanding wealth accumulation, namely by how much would wealth be reduced if there were no inheritances.

¹⁶ Aggregate private wealth corresponding to the EVS is DM 5,500 billion in 1988.

¹⁷ The amount of inheritance taxes according to the Bundesfinanzministerium, Arbeitskreis Steuerschätzung, see Heuser (1994).

Probit estimates of household wealth

An ordered probit model was used because the dependent variable, wealth, is a categorical variable in the SOEP: see Table 2a.¹⁸ Table 2b shows the independent variables used in the regression, together with the estimated parameter values.

The positive coefficients of the age dummies show that all age groups, even the very oldest households, tend to own more wealth than the reference group consisting of the youngest households (< 45). As expected, a high monthly household income and being married both increase the probability of being wealthy. Owning a home also shows a positive coefficient, but one has to be aware of a potential problem. If the household bought the house out of its own resources, then the estimates are correct; but because the house may have been inherited (which we don't know), the coefficient has to be interpreted with care.

The school education of the head of household has no statistical significance: only those reporting "Hauptschulabsolventen" (the lowest school level in Germany) are likely to be less wealthy than household heads with at least "mittlerem Bildungsabschluß". However, the inheritance variables V14 and V15, showing if and when a household received an inheritance, are statistically important. The real amount of an inheritance is a positive influence on the wealth of a household. The second variable (V15) is computed as the amount of the inheritance multiplied by the number of years since it was received. The ratio of V15 to V14 can be interpreted as a kind of "linearised" interest rate. It is about -0.015, which suggests that bequests are consumed at a rate of 1.5 per cent per annum. The negative coefficient shows that the earlier a household inherits, the smaller the probability that it creates current wealth. This indicates that inheritances are consumed through the years, and therefore become less important over time for household wealth.

To assess the quality of the model, the coefficients of the probit estimation are used to calculate the wealth of every household as a function of socio-demographic characteristics. Table 3 cross-tabulates the number of actual cases in each wealth category and the number of predicted cases. For example, the third line indicates that the model places ten households belonging to category 3 in category 1, 171 into category 2, etc. Ideally, all the cases should appear on the main diagonal, since then the model would exactly reproduce the true data. Table 3 shows that 1,501 households appear on the main diagonal, so the model correctly predicts the wealth category for 49 per cent of the sample.

Table 2a:
Wealth categories used in the regression

Wealth category	DM
1	0
2	20,000–60,000
3	60,000–200,000
4	200,000–400,000
5	over 400,000

¹⁸ The question asked in the SOEP questionnaire was: "When you give a rough estimate of the total wealth of this household (financial and real wealth, *Sachvermögen*, including self-used housing equity, but excluding household effects), about how high is the total amount? Do not forget to subtract mortgages or loans you may have taken out."

Table 2b:
Regression on household wealth – independent variables

Variables	Coefficient	Standard error
V1 Age < 45	–	
V2 Age 45–59	0.19 (*)	0.05
V3 Age 60–69	0.27 (*)	0.06
V4 Age 70–79	0.24 (*)	0.07
V5 Age 80+	0.34 (*)	0.08
V6 Household net income in 1000DM	0.25 (*)	0.00
V7 Married	0.26 (*)	0.05
V8 Owner of housing equity	1.83 (*)	0.05
V9 “Hauptschule” (primary school education)	–0.10 (**)	0.05
V10 “Abitur” (high school education)	0.10 (–)	0.07
V11 “Realschule” (middle school education)	–	–
V12 other school education	0.07 (–)	0.32
V13 no school education	–0.21 (–)	0.22
V14 Inheritance in DM	5.97e-06 (*)	6.57e-07
V15 Inheritance in DM * years since inheritance	–8.43e-08 (*)	3.28e-08

Remarks:

Number of obs = 3,074

χ^2 (13) = 2,486.85

Prob > χ^2 = 0.0000

Log Likelihood = –3,424.582

Pseudo R² = 0.2664

(*) 1% level of significance; (**) 10% level of significance

Reference variables are denoted by “–”.

Source: SOEP 1988.

Table 3:
Analysis of household wealth

Actual wealth category	Estimated wealth category					Total
	1	2	3	4	5	
1	231	362	27	7	3	630
2	206	735	61	52	9	1,063
3	10	171	184	158	38	561
4	3	19	179	232	70	503
5	1	15	6	118	119	317
Total	451	1,302	515	567	239	3,074

Prognosis of household wealth with and without inheritances

In order to quantify the impact of bequests on wealth holdings, the wealth of each individual household is recalculated with the inheritance-related variables set to zero. This provides an estimate of how large the wealth of each household would be if it had never

received an inheritance. Table 4 compares the wealth categories in the complete model with the wealth categories obtained in the absence of inheritances. The number 17 appearing in column 1, row 2 of Table 4 means, for example, that 17 households would find themselves in wealth category 1 rather than category 2 if they had not received an inheritance. As expected, omitting inheritances only results in transitions into lower wealth categories. Furthermore, Table 4 shows that the transitions affect mainly the upper wealth categories.

The transitions between wealth categories do not allow transfer wealth to be estimated. In order to get an estimate, the probability of being in each of the five wealth categories was calculated for every household on the basis of the estimated parameters. Multiplying these probabilities by the average value of wealth in each category, and summing these amounts over the classes, yields the expected value of wealth for each household. The aggregate wealth of the population is then obtained by weighting these figures by the SOEP weighting factors. These calculations are performed both with and without inheritances.

The results of this exercise produce an aggregate wealth figure of DM 2,970 billion using the parameters of the complete regression model. This compares with aggregate private wealth of DM 2,990 billion according to the SOEP. With inheritances set to zero, aggregate wealth drops to DM 2,700 billion, which means that total wealth would be reduced by 9.1 per cent if all inheritances were confiscated. This result is in line with the one achieved by the modified flow-of-bequest method. Thus the estimate of a 10 per cent share for transfer wealth, which initially seemed surprisingly low, now looks quite reliable.

Reliability and interpretation of the results

While the evidence points to a share of transfer wealth in Germany of about 10 per cent, several points need to be mentioned. First, inheritances in the SOEP and EVS are reported for households, not for individuals. Bequests within a single household, for instance between parents and children living together, are not included. However, the proportion of multi-generation households in Germany is fairly small, about 15 per cent (Reil-Held, 1993). Secondly, the above results apply only to the aggregate wealth of the population. Due to its skewness, the impact of inheritances on the distribution of wealth may be quite different. Only 15 per cent of the households report the receipt of an inheritance between 1960 and 1987; and, as Table 4 indicates, among the group of households that reported a transfer, the value of transfers is distributed very unevenly. A more detailed analysis that distinguishes different

*Table 4:
Analysis of household wealth with and without inheritances*

Wealth category with inheritances	Wealth category without inheritance					Total
	1	2	3	4	5	
1	451	0	0	0	0	451
2	17	1,285	0	0	0	1,302
3	0	11	504	0	0	515
4	1	10	71	485	0	567
5	4	8	26	53	148	239
Total	473	1,314	601	538	148	3,074

levels of wealth and/or income is required in order to assess the importance of bequests for the distribution of wealth and for the relevance of the life-cycle hypothesis.

5. Summary and conclusions

The contribution of bequests to the accumulation of private wealth in Germany seems to be low in comparison to results for other countries. According to the SOEP and EVS in 1988, only about 10 per cent of private wealth appears to be created by intergenerational bequests, narrowly interpreted. The main portion of wealth seems to be due to other factors such as *inter vivos* transfers and life-cycle accumulation. The motivation for these other determinants of savings remains an open question, because the dis-saving of the elderly as predicted by the life-cycle hypothesis has not been confirmed empirically for Germany (Börsch-Supan and Stahl, 1991; Börsch-Supan, 1992).

The principal reason for the low share of transfer wealth in Germany is presumably the particular circumstances after the war. However, the basic characteristics of the German economy are now similar to other countries, and in the post-war period it has been possible to accumulate wealth without it being destroyed by war or currency reforms. This development is reflected in the growth of revenue from inheritance taxes, which doubled to DM 3044 million in the period from 1985 to 1993.

The main factors that will determine future trends are changes in the age structure of the population, and the accumulation of wealth that can be inherited. The assumption of an exponential growth of the population will certainly not apply to Germany in the next decades. Germany already has a relatively old population, and the ratio of donors to recipients will change significantly over the next years, reaching a peak within the next few decades before starting to decline. Any forecast of inherited wealth therefore needs to take account of the ageing of the population. For the next few decades these factors will dominate the effects that underlie the analysis by Kotlikoff and Summers (i.e., constant exponential growth of population and productivity). This means that the share of inherited wealth in Germany is expected to rise above the 30 per cent figure which they calculated for the U.S.

The quantitative importance of bequests as a saving motive also remains an unanswered question. To provide an answer, voluntary and involuntary bequests have to be separated. This is not possible with the data currently available.

Finally, this paper has considered only bequests between generations. It excludes bequests within a generation, most notably between spouses, and also transfers *inter vivos*, which should be included when talking about transfer motives. In 1990, German parents paid about DM 11.5 billion in *inter vivos* transfers to their children.¹⁹

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¹⁹ Author's own calculations based on the SOEP.

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