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Wealth, Inequality, and Altruistic Bequests

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Abstract

This paper examines the role of bequests and inter vivos gifts in the U.S. economy, considering their importance in determining (i) the economy's aggregate capital stock, (ii) the distribution of private net worth, and (iii) public policy outcomes and options. It focuses on several recent calibrated simulations.

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Wealth Inequality and Altruistic Bequests

This paper examines the role of bequests and *inter vivos* gifts in the U.S. economy, considering their importance in determining (i) the economy's aggregate capital stock, (ii) the distribution of private net worth, and (iii) public policy outcomes and options. It focuses on several recent calibrated simulations.

There is a longstanding debate in the economics literature about the relative importance of life–cycle and bequest–motivated wealth accumulation (e.g., Modigliani [1988]). The same issue arises in analysis, for example, of the well–known simulation model of Auerbach and Kotlikoff [1987]: in the ultimate variant of the model (in Ch.11), pure life–cycle incentives do not fully account for the U.S. capital stock. The omission of private intergenerational transfers might explain the shortfall.

There is little disagreement that the U.S. distribution of private net worth is highly concentrated (e.g., Wolff [1996]). In the 1995 *SCF*, the top 5 percent of wealth holders account for 56% of private U.S. net worth, the top 1 percent hold 35%, and the Gini coefficient is .79. Even after adjusting for private pensions and consumer durables (see Laitner [2001]), the shares are 48% and 28%, respectively, and the Gini is .73. Put another way, mean net worth per household (in the original data) is $212,000, but the median is only $57,000. It seems that a complete model of saving might require two types of households: a small group who have enormous net worth, and a large group who have little.

The different policy implications of the life–cycle and the simplest altruistic model are well–known: in a life–cycle model, national debt and unfunded social security crowd out private capital accumulation (e.g., Diamond [1965]); in a representative–agent incarnation of the altruistic model, debt and social security may well have no effect on capital at all (e.g., Barro [1974]). In fact, the economy's equilibrium capital intensity is almost always an issue in the former model; in the latter, it tends to be affected through taxes on estates and the income of capital (e.g., Chamley [1986], Lucas [1990]).

This paper reviews three models with bequests, considering their merits. Then it describes several recent calibration studies.

Framework

We first present several variants of a very stylized model. It has a closed economy with an aggregate production function. There are no business cycles. We focus on steady–state equilibria. Households are born with differing earning abilities — the distribution of the latter being exogenous and stationary — but they all have the same preference orderings. We assume that even if parent households care about the utility of their descendants, altruism does not flow the other direction (eg, Laitner [1997]).

Each household lives at most two periods, supplying 1 unit of labor in the first, and 0 in the second. A household has one adult, and he raises one child. The child leaves home as the parent retires. If a household's consumption is c_1 in youth, the corresponding utility flow is $U^{young}(c_1)$; if the household's consumption is c_2 in old age, the utility flow is $U^{old}(c_2)$. A household's probability of being alive in old age is $q \in [0, 1]$. Consider a steady state with constant wage w and interest rate r. There is a proportional tax on intergenerational transfers σ, but we omit income taxes.

In a pure life–cycle world with "actuarially fair" annuities, there are no inheritances, *inter vivos* gifts, or bequests. A household born with earning ability z solves

$$\max_{s \geq 0} \left\{ U^{young}\big(z \cdot w - s\big) + q \cdot U^{old}\big(s \cdot (1 + r)/q\big) \right\} , \tag{1}$$

where s is life–cycle saving. This is our version of, say, the model of Auerbach and Kotlikoff [1987]. There will be a distribution of asset holdings by the elderly, reflecting the distribution of z, and there will be a distribution of earnings among the young.

Figure 1 provides a graphical representation of the overall economy. With a Cobb–Douglas aggregate production function, the ratio of factor shares is constant; hence, the capital stock divided by the wage bill, say, $K/(w \cdot L)$, must be proportional to the reciprocal of the interest rate. That sets the "demand for capital" curve. At each prospective steady–state r, the life–cycle model determines average net worth per household divided by average earnings, say, $W/(w \cdot L)$. That determines the steady–state "supply of capital" curve, say, ab. The intersection of the curves determines the economy's steady–state equilibrium. An upward sloping supply curve, as illustrated by ab, would be typical in this case.

There are a number of ways to incorporate intergenerational transfers. First, suppose annuities markets do not exist. Then a household born with earning ability z and (aftertax) inheritance i solves

$$\max_{s \geq 0} \{U^{young}\big(i + z \cdot w - s\big) + q \cdot U^{old}\big(s \cdot (1 + r)\big)\} \ . \qquad (2)$$

With no access to annuities, the household's rate of return on life–cycle saving is lower. If the household remains alive in its second period of life, its bequest is 0; if it dies, its heir inherits $s \cdot (1 + r) \cdot (1 - \sigma)$.

Suppose estates pass from parents to their children. Solution of (2) yields a function $s = S(i, z)$. This and mortality determine a Markov process over contemporaneous pairs (i, z). Provided the process has a stationary distribution, one can determine a stationary cross sectional distribution of net worth, and then average net worth. Each r then maps to a point on Figure 1's supply curve. This is the model of Gokhale *et al.* [2001]. There is no reason to expect the supply curve's shape to differ qualitatively from ab. Call this the "accidental bequest" model.

A second model assumes a parent derives a flow of utility from his bequest. Restore annuities. Let bequest b yield utility $F\big(b \cdot (1 - \sigma)\big)$ to its donor. A parent with earning ability z and net inheritance i solves

$$\max_{s\geq 0,\, b\geq 0} \{U^{young}\big(i + z\cdot w - s - b\big) + F\big(b\cdot(1+r)\cdot(1-\sigma)\big) + q\cdot U^{old}\big(s\cdot(1+r)/q\big)\}\ . \quad (3)$$

Maximization determines the child's inheritance, say, i', as a function of i and z: $i' = I(i,z) = (1+r)\cdot(1-\sigma)\cdot b$. Again we have a Markov process on pairs (i,z) and can hope to generate a supply curve for Figure 1. Altig *et al.* [2001] is a recent simulation study in this vein. Again, we expect a supply–curve shape resembling ab. Call this the "joy of giving" model.

A third model assumes a parent cares about his descendants' utility. Suppose that each parent cares about his own lifetime utility; that of his child, though weighted by $\xi \in (0,1]$; that of his grandchild, weighted by ξ^2; etc. Assume nature reveals each person's earning ability when the latter is a child. Let parent and child abilities be uncorrelated (though this is merely for simplicity). Let V be a young parent's total utility, summing his lifetime utility with what he vicariously derives from his descendants. Then we have a Bellman equation: for a parent with earning ability z and inheritance i,

$$V(i,z) = \max_{s\geq 0,\, b(z')\geq 0} \{E_{z'}[U^{young}\big(i + z\cdot w - s - b(z')\big) + \xi\cdot V\big(b(z')\cdot(1+r)\cdot(1-\sigma), z'\big) + q\cdot U^{old}\big(s\cdot(1+r)/q\big)]\}\ , \quad (4)$$

where z' is the child's ability. Letting the child's inheritance be i', maximization determines $i' = I(i,z,z')$. Given exogenous distributions for z and z', one can define a Markov process from tuples (i,z) to (i',z'). Laitner [2001] shows the process generates a unique stationary distribution. If we collapse the distribution of earnings to a point, we have the familiar "representative agent" model. Its supply curve in Figure 1 is well–known to be a horizontal line, say, cd (for cases with $b > 0$). The line's height depends on preference and demographic parameters and on tax rates. Laitner [2001] shows that with a distribution of abilities, Figure 1's supply curve resembles ef, bounded above by the line cd and asymptotic to it. Call this the "altruistic" model.

Turning to comparisons of the bequest models, we know surveys show roughly half of U.S. households ultimately inherit (eg, Laitner and Ohlsson [2001]). Model 2 can be consistent with this: only parents dying young bequeath. Model 3 is easily consistent as well: parents with high inheritances and/or earnings bequeath; low resource parents do not — lodging at a "corner solution" with $b = 0$. Model 1, on the other hand, will generally not yield this outcome without a very specialized F.

Survey evidence also implies that *inter vivos* gifts are substantial in aggregate (eg, Gale and Scholz [1994]). For consistency with this, model 1 would generally require separate utility functions for bequests and gifts. It is difficult to see how the accidental model would ever explain gifts — which are certainly intentional. Altruistic parents, on the other hand, might well transfer both gifts and bequests (eg, Laitner [2001]).

A lack of annuity markets is a key assumption of the accidental model. In practice, private pensions often incorporate annuities, but independent annuities are rare. The conventional explanation is that adverse selection makes these securities unattractive. However, the introduction notes that a miniscule group of wealthy households noticeably affect total U.S. net worth. It seems likely that insurers could offer individually–tailored annuities to very wealthy individuals, administering thorough health examinations to circumvent adverse selection. Yet, this virtually never seems to happen in practice.

Existing evidence on the division of estates within families shows a tendancy toward equal shares, regardless of siblings' job market success (eg, Laitner [1997]). This is contrary to the altruistic model, but not to the other two. For consistency with altruism, one might have to argue that social norms demand equal division of estates.

If government confiscates accidental estates, donors should not care. The latter seems inconsistent with the estate planning which wealthy individuals often undertake.

Finally, recent regression results in Laitner and Juster [1996], Altonji *et al.* [1997], and Laitner and Ohlsson [2001] display sign patterns consistent with the altruistic model but not our other two: private transfers seem negatively related to descendant earning abilities (though positively related to donor resources). Nevertheless, Altonji *et al.* develop a quantitative parameter restriction consequent to altruism, and their data rejects it by a wide margin. Laitner and Ohlsson also reject it. In the end, outcomes see ambiguous. One possible problem is that actual intergenerational transfers presumably follow from a mixture of motives (eg, Nishiyama [2001]), and statistical specifications should take this into account. Another is that most surveys have a thin sample of rich households — the very group for whom bequest incentives are probably most powerful.

Simulation Models

As noted, recent examples of calibrated simulation models include Altig *et al.* [2001] with "joy of giving" bequests and Laitner [2001] with "altruistic" bequests. Both calibrate their model to aggregate U.S. net worth. Each has life–cycle and transfer–motivated wealth accumulation, and both provide a breakdown between the two. The fractions due to life–cycle saving alone are, respectively, .70 and .67. In other words, both find life–cycle saving to be the major explanation for U.S. wealth accumulation.

The distribution of private wealth is much more concentrated than the distribution of earnings. Existing work suggests life–cycle saving can explain only a small amount of the difference (eg., Huggett [1996]). Bequests seem a natural candidate to explain the rest.

Gokhale *et al.* [2001] incorporate accidental bequests. Their framework includes realistic life spans, lifetime earnings profiles, mortality tables, fertility patterns, and social security. They calibrate the distribution of earning abilities from the 1995 *SCF*. Their flow utility function, our U above, is isoelastic, $U(c) = c^{\gamma}/\gamma$. Their model is very tractable since they assume $\gamma = -\infty$. Although a high degree of curvature is not unpreceded in the literature on risk aversion, it implies, for example, that elderly households will hold as much wealth as if they were inevitably going to live to the maximal age. The paper focuses on the distribution of wealth for households aged 60–69. Empirical concentration in that range is not too different from the overall distribution: the shares of the top 5 and 1 percent are, respectively, 51 and 30%, and the Gini coefficient is .73. In the best simulation, the top shares are 49 and 33%, respectively, and the Gini is .67.

Laitner [2001] uses an altruistic model. The demographic framework is simpler than Gokhale *et al.* but otherwise similar. The paper carefully specifies the earning distribution and the Federal estate tax. Flow utility is again isoelastic, and the paper jointly calibrates γ and our intergenerational weight ξ to match aggregate net worth and estate tax revenues. In the ultimate simulation, $\xi = .82$ and $\gamma = .70$. Thus, parents care almost as much about their grown children as about themselves, and households are surprisingly tolerant of risk. As in the case of Gokhale *et al.*, the model is able to match the empirical distribution of wealth: simulating over all ages, the shares of the top 5 and 1 percent are, respectively, 43 and 25%, and the Gini coefficient is .75.

Policy Implications

Long–run policy implications tend to depend heavily on the shape of Figure 1's supply curve. Think about the life–cycle model, with curve *ab*. Add a perpetual national debt D. Then we must move to a higher steady–state interest rate, the rate at which household net worth exceeds the business sector's demand for capital exactly by D. In the representative agent dynastic model, with supply *cd*, the same logic shows no change in the equilibrium interest rate is necessary — a manifestation of Barro's famous "Ricardian equivalence."

One does not expect accidental or joy of giving bequests to affect the shape of supply curve *ab*. With altruism and heterogeneous earning abilities, on the other hand, Ricardian results follow if equilibrium lies in the (nearly) horizontal part of supply curve ef, whereas life–cycle results follow if equilibrium lies to the left, in the steeper range of the curve. Laitner's [2001] best calibration points to an equilibrium in the former region. Then one's attention turns to the position of the horizontal asymptote — which marginal tax rates, for example, affect.

Conclusion

A number of models of bequest behavior seem able to account for aggregate wealth accumulation — though recent studies show life–cycle saving accounting for most of the total. Perhaps more interesting, several models with bequests and a realistic distribution of earning abilities replicate the extreme concentration of the empirical distribution of private wealth. In at least one of these models, private intergenerational transfer behavior is capable of generating dramatic policy implications.

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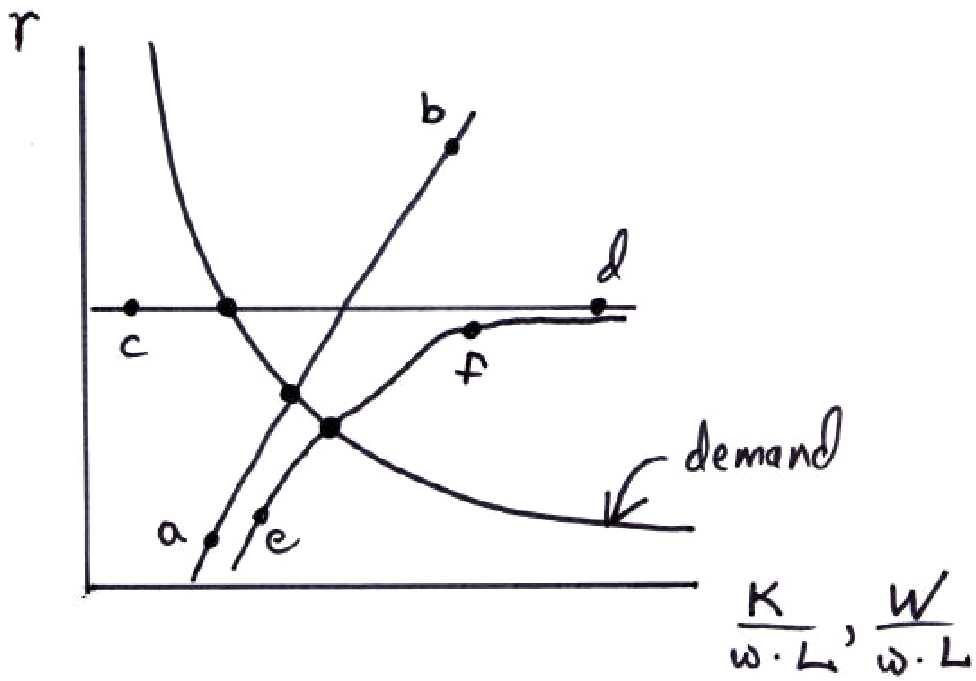

Fig 1: The demand and supply of capital