Determining Who's Altruistic: Evidence from Estate Tax Data

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Abstract

The role of intergenerational altruism in explaining disparities between predicted and actual patterns of wealth accumulation is still unclear. Recent works suggests traditional testing methods may fail because altruism is in fact heterogeneous across the population. This paper uses a heretofore unexamined data set to attempt to identify demographic characteristics that may be correlated with indications of intergenerational altruism. I find bequests are more likely to be distributed in a manner consistent with intergenerational altruism when the decedent is not survived by a spouse, when the beneficiary is female, or when the decedent did not give significant inter vivos gifts. Female decedents in particular appear to be much more altruistic towards female beneficiaries than they are to male beneficiaries. The giving of charitable bequests and estate size appear to have no effect on bequest distribution.

JEL Codes: D12, D19, D31, D64
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1. Introduction and Background

It seemed we had found the explanation of why people save when Modigliani and Brumberg (1954) introduced the life-cycle hypothesis, which suggests people save in order to smooth consumption over their lifetime. However, empirical tests indicate higher savings rates than those predicted by the life-cycle hypothesis. Kotlikoff and Summers (1981) concludes only 20 percent of savings can be explained by life-cycle motives. The remaining 80 percent occurs (they assert) because people want to accumulate wealth that can be passed on to subsequent generations. Bernheim (1991) examines data on annuity and life insurance purchases of the elderly and finds evidence of an operative desire by parents to make intergenerational transfers.[1] While the percentages vary with the data and methods employed, there is general agreement that savings rates significantly exceed those predicted by the life-cycle hypothesis.

Intergenerational altruism seemed a likely candidate for parental bequest motives. That is, parents make bequests because of their love and affinity for their children. Assuming this affinity extends equally to all children suggests parents would use bequests to smooth income and wealth differences across children. Poorer children would receive larger bequests and wealthier children would receive smaller bequests, thereby (ideally) equalizing post-bequest wealth. Unfortunately, empirical tests consistently fail to confirm this hypothesis. Hurd (1987) and (1989) and Cox and Rank (1992) find no evidence of altruism in their respective analyses. Several researchers, using different datasets, find positive but weak evidence of altruism.[2] The evidence is substantial that parent-to-child bequests do not follow the pattern expected of altruistically motivated bequests.[3] This paper examines the hypothesis that altruism is experienced differently by different groups of people. If true, this would explain why past studies fail to find convincing evidence of altruism.

Other bequest motives have also been considered. Bernheim, Shleifer, and Summers (1985) was one of the first to suggest intergenerational wealth transfers, and bequests in particular, could

[1] Similarly, Laitner and Juster (1996) finds that many older, wealthy people have a strong desire to leave large portions of their wealth to their children and concludes that 25 percent of all wealth is accumulated for this reason. Gale and Scholz (1994) concludes 31 percent of wealth is accumulated for the purpose of bequeathing it to children. Bernheim, Lemke and Scholz (2004) and Page (2003) find a positive relationship between estate tax rates and the magnitude of inter vivos transfers, suggesting at least some bequests are intentional.

[2] See Kopczuk and Lupton (2004), McGarry and Schoeni (1995,1997), Wilhelm (1996), and Kuehlwein (1993) for example.

[3] Schoeni (1997) provides a good review of this literature.

in fact be part of an exchange between parents and children.[4] By accumulating wealth that could be given as bequests parents encourage children to visit, call, and provide other attentive services. The possibility of receiving a large bequest could induce children to provide more of these services than they would have otherwise done.

If bequests are primarily exchange-motivated we would expect to see a *positive* relationship between bequests amounts and pre-bequest heir wealth, because wealthier children are better able to provide the kinds of attention and services parents desire. They can make more frequent cross-country trips to visit their parents, and they can more easily afford to bring any grandchildren as well. (Note this gives no insight as to the magnitude of the relationship between bequest size and pre-bequest wealth.) Empirical tests also fail to clearly confirm or reject this hypothesis.

Our inability to confirm either of these hypotheses led some researchers to propose more diverse explanations. Andreoni (1989) suggests leaving bequests provides the giver with a "warm-glow," and that bequest size may enter the giver's utility function. Stark and Zhang (2002) theorize that counter-compensating transfers (giving more to productive, high-earning children) is the rational approach to maximizing family wealth. Finally, there is the possibility that many bequests are accidental – people leave bequests simply because they die before spending as much as they had intended. This would suggest there is some as-yet-undiscovered reason people save more than predicted by the life-cycle hypothesis.[5]

Understanding why people leave bequests is important because different motives could cause certain government policies to produce different outcomes. For example, if bequests are intentional then reducing or eliminating estate taxes could increase aggregate savings.[6] However, if bequests

[4] See also Cox (1987) and Cox and Rank (1992).

[5] Complicating our analysis is the fact that so many decedents divide their estates nearly equally among their heirs. Several have documented this fact (e.g., Menchik (1988) and Wilhelm (1996)) but we have yet to do more than postulate explanations for it. One possibility is that there are costs to leaving unequal bequests. Lundholm and Ohlsson (2000) suggests decedents suffer a decrease in post-mortem reputation by giving unequal bequests. Wilhelm (1996) finds some empirical support for the idea that dividing bequests unequally carries a psychic cost for the decedent. Stark (1998) proposes that some parents divide bequests equally in order to avoid causing any dismay or displeasure for the recipient of a smaller bequest. Bernheim and Severinov (2003) expands this notion by suggesting that unequal bequest division imposes a psychic cost on both parents and children. They construct a model in which equal estate division is a plausible outcome for many decedents.

[6] Gale and Perozek (2001) employs a partial-equilibrium analysis to demonstrate this possibility.

are primarily accidental then eliminating estate taxes would have little effect on savings.[7] The Ricardian equivalence theorem (Barro (1974)) asserts that government debt has no real effects when consumers are intertemporally linked by altruistically motivated intergenerational transfers. Government debt is not neutral though, when bequests are exchange-motivated (Bernheim, et. al. (1985)) or accidental. This dependency provides additional motivation for economists to clarify reasons for wealth accumulation.

Recent theoretical works suggest the reason we can neither accept nor reject altruism is that it appears in varying degrees across the population. Jaeger (1998) laments that "the theoretical literature on [Ricardian equivalence] is mainly based on the "representative individual" device, i.e. on the assumption of homogeneous individuals within each generation."(p. 140) A growing body of literature explores this idea, with some authors explicitly modeling altruism as heterogeneous. (See Michel and Pestieau (2005) and Dutta and Michel (1998) for example.)

The notion that altruism varies across the population warrants further examination and is the focus of this paper. Altruism may be more strongly associated with some demographic characteristics than with others. Perhaps parents feel more altruistic towards female heirs than they do towards male heirs, believing the latter should fend for themselves financially. Alternatively, female decedents may be more altruistic than male decedents (or vice versa!) Were we able to identify any characteristics indicative of altruism it would further our understanding of why people accumulate wealth. Empirical work on this issue is notably lacking from the literature, a gap this paper takes a step toward filling.

I use estate tax data to examine the bequest and income patterns of relatively wealthy families to determine whether intergenerational altruism is more strongly associated with any particular demographic characteristics. The basis of this study is a set of approximately 4,600 estate tax returns filed with the IRS in 1988, 1989, or 1990. When possible, the IRS combined these estate tax returns with the decedent's income tax returns for the three years preceding death and with the income tax returns of all heirs listed on the estate tax return for the three years preceding and following the decedent's death. This combination of estate returns and income tax returns provides

[7]Table 4 in Cremer and Pestieau (2003) summarized the repsonses expected from different fiscal policy changes under different bequest motives.

a rare view of the magnitude of wealth transferred between generations and of the economic effects of this transferred wealth. I divide this data into sub-samples by various demographic characteristics and compare the regression results.

Many existing studies are constrained by limitations of their data, few of which are present here. The information necessary for this type of study includes the wealth of decedents and income of heirs before bequests are given, as well as the exact amount of bequests given to each child. Some studies use datasets with data on wealth holdings of elderly individuals (e.g. Laitner and Juster (1996) and Gale and Scholz (1994)) or on the size of bequests given (e.g. Menchik (1983)) but none employ a dataset with both components.[8] By focusing on relatively wealthy families I avoid problems of bequest and liquidity constraints that may cause some sample members not to give bequests in other, similar studies. Using tax data avoids reporting problems associated with voluntary reporting that may also affect other studies.

The paper proceeds as follows. Section 2 reviews the theory involved and Section 3 describes the data employed in the analysis. Section 4 presents the results and Section 5 concludes.

2. Altruistic Bequests

The hypothesis that bequests are altruistic focuses on beneficiary's income as the primary explanatory variable for differences in within-family bequests. The goal of this paper is to examine the data for evidence that altruism differs between different demographic groups.

2.1. The Model

The model employed is a simple version of the dynastic model of Barro (1974) and Becker (1974). A parent is altruistic towards his children, lives for only one period, and has bequeathable wealth W. He decides how to divide his wealth between bequests to his children and his own consumption.[9]

[8] An exception is Wilhelm (1996) who uses an earlier version of the IRS dataset. He reports finding at best a weak correlation between heir's earnings and bequests.

[9] Gifts to a spouse, charity, and other relatives are also possible, but are omitted here for simplicity. Their omission has no impact on the analysis of how parents distribute bequests that are given to children.

The children also live for one period but make no decisions. Child i of parent j has pre-bequest income I_{ij}, and receives bequest $B_{ij} \geq 0$. A child's utility is simply $u_c(I_{ij} + B_{ij})$.[10] Let $u_p(C_p)$ be the parent's direct utility obtained from consuming an amount C_p. (Assume $u_c(\cdot)$ and $u_p(\cdot)$ have the standard 'nice' properties.) Parent j's total utility, assuming he cares equally about all his children, is

$$U_{p_j}(W_j) = \rho \sum_{i=1}^{N} u_c(I_{ij} + B_{ij}) + u_{p_j}(C_{p_j}) \tag{1}$$

where $N > 0$ is the number of children and $\rho \geq 0$ is the intergenerational discount rate. The parent's budget constraint is

$$W_j \leq \sum_{i=1}^{N} B_{ij} + C_{p_j}. \tag{2}$$

Let $Y_{ij} = I_{ij} + B_{ij}$ be child i's post-bequest income. Then maximizing the parent's utility subject to his budget constraint and combining first order conditions gives[11]

$$\frac{\partial u_c}{\partial Y_{ij}} = \frac{\partial u_c}{\partial Y_{kj}} \qquad \forall i, k = 1, ...N, i \neq k. \tag{3}$$

Equation (3) holds if and only if $Y_{ij} = Y_{kj}$. That is, an altruistic parent maximizes his utility only by equating the after-bequest income of his children. Within a family, this hypothesis is straightforward to test: simply check whether children with smaller incomes receive larger bequests. However, since families differ with respect to the size of the decedent's estate, two children with identical incomes but from different families are likely to receive different bequest amounts. To account for this difference I include family wealth in the regression equation. This produces the following fixed-effects model:

$$B_{ij} = \beta_1 I_{ij} + \beta_{2j} W_j + \epsilon_{ij} \tag{4}$$

in which β_1 measures differences in bequests due to intra-family income differences of children and β_{2j} accounts for differences in bequests due to inter-family differences in parental wealth.[12]

[10] Since u_c is in fact the parent's perception of the child's utility function it is reasonable to assume the same utility function for all children.

[11] This result assumes an interior solution. Since the decedents in this study left sizable estates it is reasonable to assume they are not bequest constrained.

[12] The results of this analysis change little if logs of bequests and income are used instead of their absolute levels.

2.2. Implications

It is worthwhile to consider the value we expect to obtain when estimating β_1. If altruism is the sole parental motive for bequests and beneficiary income perfectly captures all information the parent needs to differentiate between different children then we would expect an estimate of $\beta_1 = -1.0$.

Unfortunately, differences in beneficiary income may not provide all information desired by parents, and our estimate may differ from -1.0 even if altruism has the major role in determining bequest differences. For example, the best model may be one that uses beneficiary wealth as the explanatory variable rather than income. Since income is generally correlated with wealth we expect it to be a reasonable proxy, but using it may introduce some bias to the results. Differences in relatively small bequests (e.g. less than $25,000) may in fact be based on differences in childrens' incomes rather than wealth differences, leading to little or no bias. However, differences in relatively large bequests (e.g. greater than $1,000,000) are more likely to be based on differences in childrens' wealth levels. Consider two children from the same family who have different incomes. If wealth differences are the accumulation of many years of income differences then the difference in their wealth is likely to exceed the difference in their incomes. In this case the true coefficient on income will be less than -1.0, indicating that the bequest compensates a lower earning child for several years of lower income.

Further, other bequest motives may work in concert with altruism to influence a parent's bequest decision. The bottom line is that we are unlikely to get coefficient estimates of exactly -1.0 even if altruism is a significant bequest motive. Sufficient for this analysis is that the bequest-income coeffecient estimate be negative and significantly different from zero.

3. The Data

The dataset used for this work is the IRS's 1989 Estate Collation File. This file combines the estate tax returns of the decedent with selected demographic data for each beneficiary and, when available, prior year income tax return (1040) data for both the decedent and the beneficiaries.[13]

[13]Internal Revenue Service (1993) describes the estate tax data in detail.

For beneficiary income I use the adjusted gross income (AGI) reported by the beneficiary on their tax return. Up to three years of pre-death tax returns can be available in this data. When more than one year of data exists, I compute average annual AGI in 1989 dollars.[14] An important difference here is that this dataset includes information on bequests given to (or through) trusts when the trust is tied to a particular individual, information that is generally unavailable in other bequest studies.[15] Amounts given to a trust for an individual are included as part of the bequest they receive.

Since this project looks at bequests from parent to child, I first eliminated all decedents who had no direct descendants listed on their estate tax return. This eliminated nearly half the decedents, leaving 2,646, with 6,265 children. For this work "children" includes all natural sons (47.6 percent) and daughters (48.3 percent), as well as any adopted (0.10 percent), foster (0.06 percent), and step-children (3.91 percent).

Gross estates for this sample range from roughly $500,000 to over $700,000,000 (all values are in 1989 dollars.)[16] The first data series in Figure 1 shows the fraction of decedents by size of gross estate. The largest concentration of estates is in the $5 million to $10 million range – with 70 percent of these in the lower half of the range. The average estate for these decedents is $11,514,000; 51.2 percent were survived by a spouse, and 60.6 percent were male. The average age at death was 75.4 years for men and 79.9 years for women. Of the 6,265 descendants in this sample, 49.7 percent were male. The data indicates the vast majority (over 95 percent) were married, a portion that seems remarkably large. To avoid any possible problems from this variable, it is excluded from the following analyses. The bequests received by these descendants ranged from $0 to nearly $30,000,000 with the average bequest being $795,893. The first series of Figure 2 gives the fraction of descendants by the size of the bequest they received.

[14] Unfortunately, earned income is not allocable to individual members of a married couple in this data. Other income measures – such as total income or using one-half of AGI for married beneficiaries – had no qualitative effect on the results.

[15] A trust set up for the benefit of several individuals or an entire family would not be allocable to a single individual and thus can not be included.

[16] Up to $600,000 could be exempted from estate taxes in 1988-1990; however, a decedent who gave significant inter vivos gifts may be unable to take the entire exemption. Joulfaian (1998) provides a detailed analysis of the federal estate tax.

Figure 1: Percent of Decedents by Size of Gross Estate

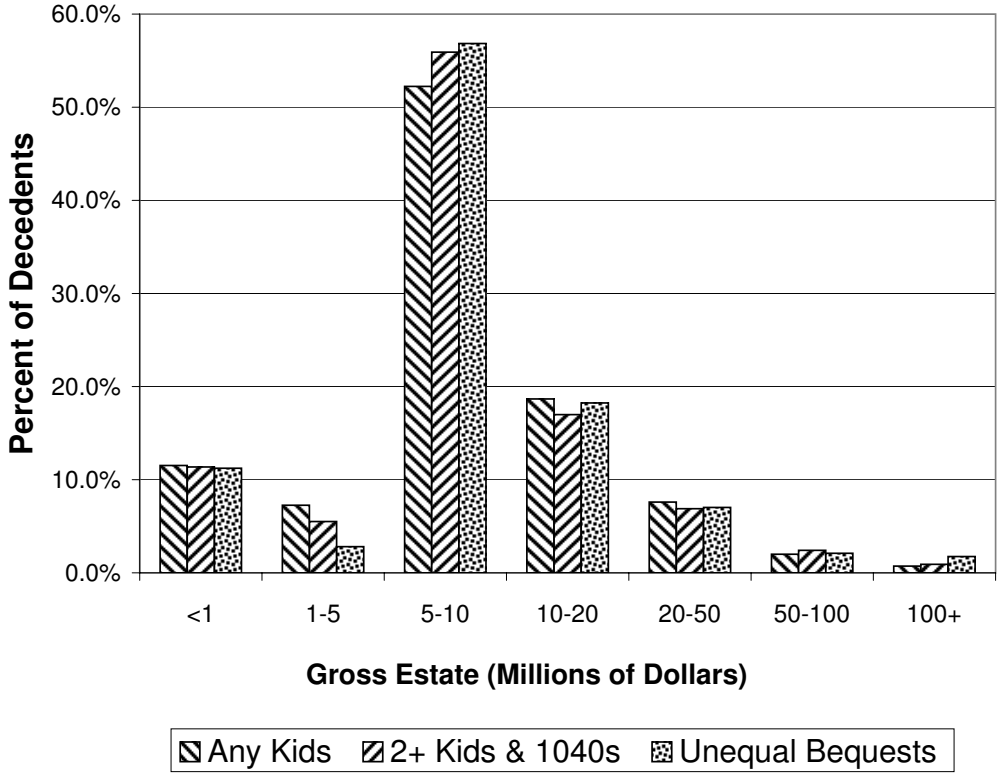
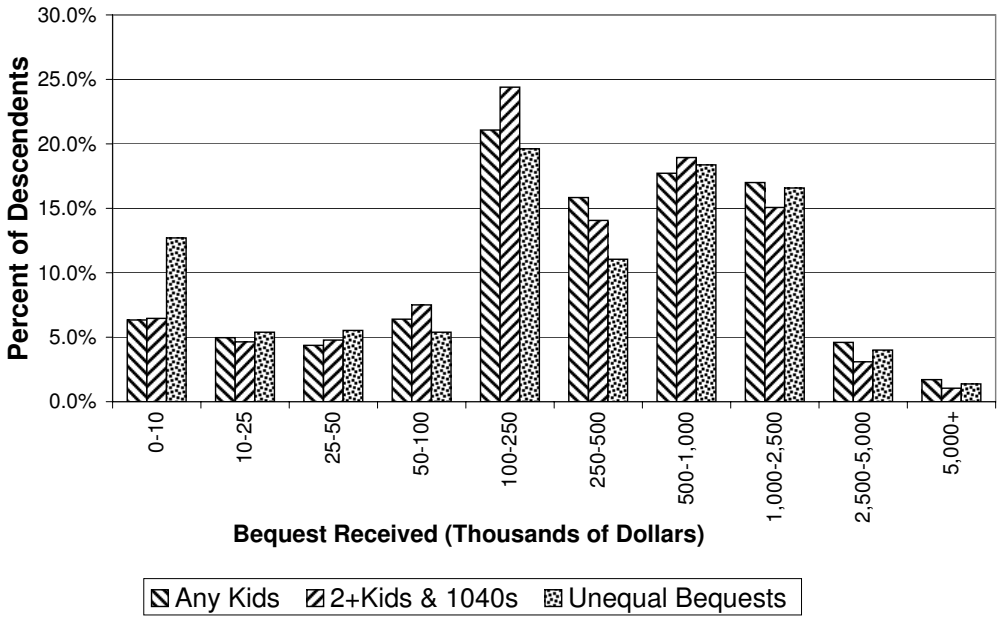


Figure 2: Percent of Descendants by Size of Bequest



As a group, decedents in this sample gave $1,873.5 million to charity and paid $6,218.7 million in taxes. Also, 323 of these decedents were previously required to pay gift taxes, suggesting they made significant inter vivos transfers.[17] Since such transfers are almost certainly altruistically motivated this could indicate that bequests made by these decedents will be altruistically distributed as well.

I next eliminate beneficiaries for whom there is no pre-death income data, and decedents who gave bequests to only one child. Unfortunately the first of these constraints proves to be quite restrictive, eliminating about two-thirds of the initial sample. The remaining sample contains 871 decedents with 2197 descendants, each of whom has at least one pre-death income-tax record in the data. This sample forms the basis for the work that follows.

Gross estates in this sample spanned the same range as the initial sample, but the average increases slightly to $12,107,000. The distribution of gross estate sizes in this sample is shown in the second data series of Figure 1. Comparing the first two data series of Figure 1 shows that the estate size distribution of the second sample closely approximates that of the initial sample.

There were 556 male decedents and 315 female decedents in this sample. 54.4 percent of decedents were survived by a spouse. Of the 2,197 descendants, 72.8 percent are male.[18] The bequests received by these descendants ranged from $0 to nearly $20.0 million. The second series in Figure 2 gives the distribution of descendants in this sample by the size of the bequest they received. Comparing the first two data series of Figure 2 shows that the bequest size distribution of the second sample closely approximates that of the initial sample. Table 1 gives additional statistics for this sample.

Lastly, since many decedents divide their estates equally among their descendants, and equally divided estates provide little guidance as to the incidence of altruism, I remove such estates from a final sub-sample. Specifically, I first compute the average bequest received by the beneficiaries of a decedent. Then I compute the absolute value of the amount by which each bequest deviates from the family average and compute the average bequest deviation within each family. If the average

[17] Gift taxes were due only on transfers in excess of $10,000 per year.

[18] It is surprising to note the much larger proportion of male decendents in this sample than were present in the initial, full sample. A probable explanation for this is that the IRS had dificulty identifying appropriate tax returns to include when a female descendent was the second taxpayer listed on a joint tax return.

Table 1: Decedents with 2+ Children with Income Data

		standard deviations
Number of decedents	871	
Average gross estate	$12,107,000	$31,133,000
Male Decedents	556 (63.8%)	
Female Decedents	315 (36.2%)	
Average age	74.9 years	11.9
(men = 73.3 ; women = 77.8)		
Average bequest per decedent	$7,060,600	$12,695,000
Male Beneficiaries	1600 (72.8%)	
Female Beneficiaries	597 (27.2%)	
Average bequest per beneficiary	$663,900	$1,289,400
Average number of beneficiaries	2.5 (max=9)	
Average beneficiary income (AGI)	$265,600	$979,500
Average beneficiary age	44.1	12.6
(men = 44.6 ; women = 42.2)		
Decedents with a surviving spouse	474	
Average given to spouses	$7,444,700	$14,858,000
(when decedent had spouse)		
Total given to charity	$459,446,000	
(by 209 decedents)		
Estates with Prior Gift Tax Paid	114	

Table 2: Restricted Sample (Decedents with Unequally Divided Estates)

		standard deviations
Number of decedents	285	
Average gross estate	$14,950,000	$48,933,000
Male Decedents	160 (56.1%)	
Female Decedents	125 (43.9%)	
Average age	76.8 years	11.8
(men = 74.7 ; women = 79.6)		
Average bequest per decedent	$6,638,800	$10,791,000
Male Beneficiaries	517 (71.4%)	
Female Beneficiaries	207 (28.6%)	
Average bequest per beneficiary	$786,000	$1,842,800
Average number of beneficiaries	2.5 (max=7)	
Average beneficiary income (AGI)	$336,700	$1,102,700
Average beneficiary age	46.4	13.3
(men = 47.0 ; women = 44.5)		
Decedents with a surviving spouse	128	
Average given to spouses	$6,652,000	$8,950,800
(when decedent had spouse)		
Total given to charity	$242,996,000	
(by 81 decedents)		
Estates with Prior Gift Tax Paid	52	

within-family deviation is less than 1 percent of the average family bequest then this decedent is considered to have given substantially similar bequests and is eliminated.[19] The remaining 285 decedents gave substantially different bequests to their 724 descendants and allow close examination of characteristics that may influence decisions about bequest distribution. This final sub-sample is refered to as the 'Restricted Sample'. The distributions of decendent gross estates and bequests received by descendants are given in the third data series of Figures 1 and 2. Note that these distributions approximate those of the first two samples. Table 2 provides statistics on this sub-sample.

Since multi-child families are the focus of this study, it may be useful to know the distribution of families by family size. Table 3 presents this data for both the sample of all decedents with children and the restricted sample. We see that the restricted sample has a slightly higher portion of two-child families. One possible explanation for this is that only two of the children in a larger family filed tax returns, rather than suggesting that two-child families have a greater tendency for unequal estate division.

Table 3: Frequency of Decedents by Number of Children in Sample

	1 Child	2 Kids	3 Kids	4 Kids	5 Kids	6+ Kids
All Decedents with children	703	958	569	266	92	58
Restricted Sample	N/A	185	62	28	6	4

4. Results

The first experiment was to estimate the fixed-effects model of equation (4) using the sample of all decedents with two or more children for whom pre-death income data is available. The results are given in the first row of Table 4.

[19] Menchik (1988) defines substantially similar bequests to be those within 1 percent of the average bequest in the family. Wilhelm (1996) uses 2 percent in his analysis.

Note the coefficient on child's income is negative and significant (the null hypothesis being that the coefficient is equal to zero). This suggests that, for each additional dollar of income a child earned, the parent reduced that child's bequest by \$0.068. The fact that over 70 percent of these decedents gave essentially equal bequests to all beneficiaries makes it unlikely we would see much impact from income variations. Removing such decedents may give more substantive results.

Table 4: Test Results: Checking for Altruism

Sample	Coefficient Estimate	Standard Error	t-statistic	Regression F-statistic
Full Sample	−0.068	0.0168	−4.20	16.14
Restricted Sample	−0.156	0.0442	−3.54	12.53

The second experiment involved estimating equation (4) for the restricted sample. The results are shown in the second row of Table 4. Again the bequest-income coefficient is negative and significant. However, the estimate of a \$0.156 bequest increase for each dollar decrease in beneficiary income is not as large as might be expected from truly altruistic parents.[20] This value provides only a minimal indication that altruism may have a role in determining the distribution of bequests.

The major experiments examine the hypothesis that one, or more, demographic characteristics may be correlated with more substantial evidence of altruism. For these experiments I divide the restricted sample into subsamples based on the characteristic being evaluated. I estimate equation (4) for each subsample and compare the regression results for each pair of subsamples.

For example, the first experiment requires dividing the data into one subsample containing only male decedents and another containing only female decedents.[21] The coefficient estimate for male decedents is -0.213, while that for female decedents is -0.032 (see Table 5). What isn't clear however, is whether there is any significance to the numerical difference between these statistics. Chow (1960) showed that, by computing an F-statistic from the residual sum of squares for each

[20]This estimate is, however, similar to Wilhelm's (1996) estimate of \$0.127.

[21]This approach is equivalent to running a single regression using dummy variables for male and female decedents and testing for equality of the resulting regression coefficients.

regression (one for each subsample and one for the entire sample) we can test the hypothesis that the coefficient estimates for an explanatory variable are statistically different across the subsamples. The F-statistic in this case is 3.66 and has 1 and 722 degrees of freedom. Since this value is below the critical values of 3.84 for 95 percent confidence and 6.63 for 99 percent confidence we reject the hypothesis that the subsample coefficients are different.

Similar experiments are performed for several different demographic characteristics. The results are shown in Table 5. All tests have the same critical F-values.

Four of the seven experiments produced results indicating a statistically significant difference exists between the coefficient estimates of the subsamples. The first is the presence of a surviving spouse. When a surviving spouse is present the altruism coefficient is 0.251 and is significant at the 95 percent level. When no spouse is present the coefficient estimate is -0.199 and is significant at the 99 percent level. The sign difference in particular suggests the presence of a spouse has at least some influence on the distribution of bequests. Average bequest amounts when a spouse is present were only 40 percent of the average amount given when the decedent is not survived by a spouse ($437,000 vs $1,082,000).[22] We can easily imagine that the first member of a couple to die would entrust division of the couple's wealth to the survivor. Certainly the second to die would be able to collect more information about their children's income and wealth than would the first. In fact, it appears the first member of a couple to die may give bequests in a manner that rewards higher-earning children rather than altruistically.[23] To look at the issue another way, we can imagine that the first member of a couple to die would distribute some of the couple's wealth leaving the majority of it to be distributed when the second member dies. Then, if we consider the two members of the couple to be acting as a single agent, rather than as two separate agents, any monies distributed upon the death of the first member could be viewed as an inter vivos distribution by the couple.

The second significant characteristic is the gender of the beneficiary. When the beneficiary is male the regression coefficient is negative but not significant. When the beneficiary is female the

[22]This in spite of the fact that average gross estate sizes were relatively similar ($12,930,000 vs. $16,596,000). Only five of the 128 surviving spouses did not receive a bequest.

[23]The significance of a surviving spouse was also reported by Wilhelm (1996), although he did not estimate an income coefficient with and without a spouse present.

Table 5: Comparisons of Coefficient Estimates for Selected Sub-samples

Subsample Evaluated	Number of Observations	Coefficient Estimate	t-stat	F-statistic (Chow test)
Male Decedents Only	413	-0.213^{**}	-6.23	3.66
Female Decedents Only	311	-0.032	-0.30	
Decedent Has Spouse	332	0.251^{*}	2.47	9.05^{**}
Decedent Has No Spouse	392	-0.199^{**}	-3.63	
Male Beneficiaries Only	517	-0.098	-1.39	102.4^{**}
Female Beneficiaries Only	207	-0.499^{**}	-6.57	
Decedent Gave Charitable Bequest	199	0.056	0.22	1.52
No Charitable Bequest Given	525	-0.170^{**}	-4.67	
Inter Vivos Gifts Given	134	-0.010	-0.14	11.00^{**}
No Inter Vivos Gifts	590	-0.300^{**}	-5.05	
Younger Benef. (<38 yrs old)†	152	1.046	1.53	13.89^{**}
Older Benef. (>56 yrs old)	154	-0.050	-0.58	
Smaller Estate (<\$5.69 million)	180	-0.105^{*}	-2.43	0.74
Larger Estate (>\$11.0 million)	183	-0.226^{**}	-2.76	

*Significant at the 95% level.
**Significant at the 99% level.
†No age was reported for 101 beneficiaries in the restricted sample.

regression coefficient is -0.499 and is significant at the 99 percent level. This suggests bequests to female children are much more likely to compensate for income variations than are bequests to male children. While a variety of gender-oriented explanations could be posited here let it suffice to observe that the average income of female beneficiaries ($205,029) is roughly half that of male beneficiaries ($389,422), the average bequest to female beneficiaries is $952,307, and the average bequest to male beneficiaries is $719,454. This issue is explored further below.

A characteristic that does not appear to be significant is the giving of a charitable bequest. When the decedent gave a charitable bequest the altruism coefficient is small and not significant. When no charitable bequest was given the coefficient estimate is -0.170 and is significant at the 99 percent level. At first this appears counterintuitive – bequests to charity should indicate the decedent was altruistic (in at least one sense) and thus we might expect this decedent to distribute bequests altruistically as well. However, perhaps there is a difference between intergenerational altruism and the type of altruism that fosters charitable giving. It appears having one form of altruism does not necessarily imply the other. In particular, decedents who left charitable bequests tend not to distribute bequests to children altruistically while decedents who didn't leave charitable bequests do exhibit some altruistic bequest distribution.

Next, the giving of significant inter vivos gifts appears to have an impact on whether bequests are altruistically distributed. Aside from transfers for educational expenses, inter vivos gifts are almost certainly altruistically motivated. We might expect people who gave such gifts, and have therefore demonstrated their altruism, to be more likely to distribute bequests altruistically as well. Instead the results suggest bequests made by gift-givers have little relationship to beneficiary income. Meanwhile, bequests given by non-gift-givers are significantly related to beneficiary incomes. A likely explanation here is that gift-givers use their inter vivos gifts to compensate children with lower incomes and then distribute their bequests on some other basis, while non-gift-givers make more substantial use of differentiated bequests for compensating lower-income children.

The last two tests examine whether beneficiary age or decedent estate size has a role in bequest distribution. For each test I contrast the regression results for the top quartile with those of the bottom quartile. These results are shown in the last few rows of Table 5. The youngest quartile of beneficiaries are those less than 38 years old while the oldest quartile consists of those greater

than 56 years old. The results suggest beneficiary age does play a role in bequest distribution, with bequests to younger beneficiaries likely to be larger the more the beneficiary earns, although the coefficient estimate of 1.046 comes with a t-statistic of only 1.53. This result is clearly at odds with the notion of altruistically distributed bequests.

The final test indicated no significant difference between the distribution of bequests by decedents with estates in the smallest quartile (less than $5.69 million) versus those in the largest quartile (larger than $11.0 million). If higher-wealth decedents focus more on differences in beneficiary wealth and lower-wealth decedents focus more on differences in beneficiary income, then we would expect differences in the parameter estimates between these two groups.

Perhaps most intriguing of the above results are the one involving the presence of a surviving spouse and the one assessing the influence of beneficiary gender. I next examine these factors more closely. Since decedent gender is generally related to the presence of a surviving spouse (71 percent of male decedents in this data were survived by a spouse but only 26 percent of female decedents were survived by a spouse) I add it to the analysis below as well.

As observed earlier, decedents with a surviving spouse tend to give smaller bequests than do those with a spouse. The first tests here examine whether male and female decedents distribute bequests differently with, versus without, a spouse present. The results are shown in the top portion of Table 6.

Does the presence of a surviving spouse influence the distribution of bequests by a male decedent? The results suggest it does, with male decedents survived by a spouse unlikely to condition bequests on beneficiary income while those without a spouse reduce a child's bequest by $0.247 for each additional dollar of income the child earns. I find the presence of a surviving spouse to have even greater impact on female decedents. While the coefficient estimate for female decedents without a spouse is not significantly different from zero, the coefficient for those survived by a spouse is a positive 1.988, suggesting much larger bequests are given to children with larger incomes! This 'reward' to higher-income children is clearly inconsistent with the hypothesis that bequests are distributed altristically.

Table 6: Details of Decedent Gender, Spouse, and Beneficiary Gender Interactions

Subsample Evaluated	Number of Observations	Coefficient Estimate	t-stat	F-stat
Male Decedents with Spouse	277	0.027	0.33	7.02**
Male Decedents w/o Spouse	136	−0.247**	−5.48	
Female Decedents with Spouse	55	1.988**	4.68	13.93**
Female Decedents w/o Spouse	256	−0.104	−0.96	
Male Decedents with Spouse	277	0.027	0.33	45.71**
Female Decedents with Spouse	55	1.988**	4.68	
Male Decedents w/o Spouse	136	−0.247**	−5.48	1.51
Female Decedents w/o Spouse	256	−0.104	−0.96	
Male Decedents/Male Beneficiaries	289	−0.311**	−5.53	147.0**
Male Decedents/Female Benificiaries	124	−0.438**	−9.29	
Female Decedents/Male Beneficiaries	228	0.913	0.70	39.64**
Female Decedents/Female Benificiaries	83	−2.961**	−9.05	

**Significant at the 99% level.

As mentioned earlier, bequests by the first to die in a couple may in fact be considered inter vivos transfers for the couple. By rearranging the pairings of the preceding test, I next examine whether decedent gender influences bequest distribution when a spouse is present. The coefficient estimate for male decedents with a surviving spouse is not significantly different from zero while the coefficient for female decedents is the previously reported 1.988. The F-statistic for comparing these is 45.71, clearly suggesting men and women who are first to die in their respective couples distribute their bequests in signifcantly different manners. Curiously, the same is not true when we examine the influence of decedent gender for the second member of a couple to die. Both coefficient estimates are negative (although only the one for male decedents is significantly different from zero) but the F-statistic for comparing them is only 1.51, suggesting the coefficient estimates are not significatnly different from each other.

Lastly I examine the interaction between decedent gender and beneficiary gender. I find male decedents are likely to treat male and female beneficiaries differently (F-statistic of 147.0) even though they treat both altruistically, with both coefficient estimates negative and significantly different from zero at the 99 percent level. Perhaps most striking of any of these results is the influence of beneficiary gender on the distribution of bequests given by female decedents (see the bottom half of Table 6.) With an F-statistic of 39.64, the coefficient estimates are almost certainly different. The estimate for bequests to male beneficiaries is 0.913 (but a t-stat of 0.70) while the coefficient for female beneficiaries is -2.961, suggesting female decedents give \$2.961 more in bequests for each dollar less of income their female beneficiaries earn. This 'over-compensation' for income difference could be due to the fact that wealth differences may exceed income differences and the decedents are attempting to equate the after-bequest wealth of beneficiaries.

5. Conclusion

Attempts by economists to explain observed patterns of wealth accumulation and intergenerational transfers have yet to be fully successful. We find we can neither fully accept intergenerational altruism as a major explanation, nor can we reject it as having no role. I use data collected by the IRS from estate tax returns combined with income data for heirs for several years preceding death to test the hypothesis that altruism appears differentially among different demographic groups.

The data indicate that most decedents divide bequests evenly among their children. For decedents who do not divide bequests evenly, children with lower incomes do tend to receive larger bequests. While this is the direction indicated by the altruism hypothesis, the coefficient on children's incomes is not as large as expected were altruism a major factor.

I find decedents not survived by a spouse are more likely to distribute bequests altruistically than are those who are survived by a spouse. Decedents who are survived by a spouse are more likely to reward higher-earning children with larger bequests, although such bequests are generally smaller than those made by the second member of a couple to die. Similarly, bequests to female beneficiaries are more likely to be altruistically distributed than are bequests to male beneficiaries.

Decedents who gave significant inter vivos gifts are unlikely to distribute bequests altruistically, while those who did not give such gifts are more likely to distribute bequests altruistically. This is consistent with studies that report inter vivos gifts are often used to compensate children with lower earnings.

By extending the analysis to check for interactions between the presence of a surviving spouse and decedent gender I find it likely that male and female decedents distribute bequests differently when a surviving spouse is present, but do not when there is no surviving spouse. Also, male decedents appear to treat male and female beneficiaries differently than do female decedents.

I find no correlation between the distribution of bequests and the giving of charitable bequests or with the size of the estate.

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