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Do estate and gift taxes affect the timing of private transfers?

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Abstract

Proposals to alter the estate tax are contentious and have been considered largely in an empirical vacuum. This paper examines time series and cross-sectional variation to identify the effects of estate and gift taxation on the timing of private transfers. The analysis is based on data from the 1989, 1992, 1995, 1998, and 2001 Surveys of Consumer Finances. Legislative activity during this period reduced the tax disadvantage of bequests relative to gifts. Moreover, the magnitude of this reduction differed systematically across identifiable household categories. We find that households experiencing larger declines in the expected tax disadvantages of bequests reduced inter vivos transfers relative to households experiencing small declines in the tax disadvantages of bequests. This finding is consistent with the hypothesis that the timing of transfers is responsive to applicable gift and estate tax rates. The results also provide evidence of a systematic bequest motive for high-wealth households.

Keywords: Estate tax; Gift tax; Private transfers

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1. Introduction

In 2001 the federal estate and gift tax raised $29.2 billion. Debates surrounding the estate tax have been contentious,[1] but until recently there have been few studies examining its behavioral effects. This paper helps address this gap by examining the effect of gift and estate taxation on the timing of private transfers.

Learning more about the relationship between estate and gift taxation and the timing of transfers has immediate implications for tax policy. For example, one cannot accurately forecast the revenue effects of various tax reform proposals without reliable estimates of pertinent behavioral responses. Moreover, since estate tax liabilities are not incurred until death, any evidence concerning associated behavioral effects illuminates the extent to which individuals anticipate and alter behavior in response to future taxes. The topic also has broader implications concerning transfer motives. If bequests result primarily from a combination of imperfect annuity markets and uncertainty concerning the timing of death (the "accidental bequest" hypothesis), one would not expect individuals to alter significantly the composition of transfers between gifts and bequests in response to changes in the tax rate imposed on the latter.[2] In contrast, if bequests are intentional and reflect either altruism (see Becker, 1974; Barro, 1974 or Blinder, 1974) or strategic interplay between family members (see Bernheim et al., 1985 or Perozek, 1998), then the tax treatment of bequests potentially plays an important role in determining the timing of transfers.

Though there is a substantial literature on gift and estate taxation, relatively little is known about the effects of these taxes on the timing of transfers.[3] McGarry (2001) and Poterba (2001) both conclude that most households forego substantial tax savings by failing to exploit the advantages of gifts to the full extent permitted by law. This pattern could result from a failure to consider the tax consequences of giving. It is also consistent, however, with the hypothesis that individuals balance tax minimization against other considerations. Uncertainty concerning future health status, long-term care needs, longevity, and future rates of return enhance the option value of retaining resources until death, and thereby inhibit an aggressive program of tax-favored giving. Donors may eschew early transfers because they are concerned that donees will waste the money or that the transferred resources will not benefit from the donor's superior investment skills. Parents also may wish to retain resources as long as possible to maintain influence over their children.

When tax minimization competes with other non-tax priorities, a change in the relative tax rates applied to gifts and bequests can potentially cause significant changes in the

[1] Contrast, for example, the comments of Berkshire Hathaway CEO Warren Buffett, who wrote in the New York Times (2/14/01) that repealing the estate tax "would be a terrible mistake", equivalent to "choosing the 2020 Olympic team by picking the eldest sons of the gold-medal winners in the 2000 Olympics" with President George W. Bush's initial budget document "A Blueprint for New Beginnings" (http://www.whitehouse.gov/news/usbudget/blueprint/bud02.html), which proposes a repeal of the estate tax.

[2] See Davies (1981) for an analysis of the accidental bequest motive, and Hurd (1987, 1989) for evidence suggesting that purposeful bequest motives are not economically significant.

[3] See Gale and Slemrod (2001) for an excellent survey of the estate and gift tax literature.

timing of transfers. Joulfaian (2000) examines this relationship using cross-sectional variation in transfer tax rates and patterns of gifts and bequests. This is a challenging approach, as the pertinent tax rates are potentially correlated with both observable and unobservable characteristics (e.g. wealth, income, acquisitiveness) that presumably factor into decisions regarding the timing of transfers. Cognizant of this difficulty, Joulfaian uses the combined maximum federal and state statutory estate and gift tax rate to construct an instrument for tax prices, and finds evidence of a significant tax effect. The validity of Joulfaian's approach hinges on the assumed exogeneity of state-level transfer tax rates. In practice, there are at least two reasons to question this assumption. First, the pertinent policies may reflect localized political activity that is correlated with the size and composition of large estates (e.g. the farm lobby). Second, transfer tax laws may figure into the retirement location decisions of high-wealth households.

In this paper, we exploit both time series and cross-sectional variation to identify the effects of estate and gift taxation on the timing of transfers. The analysis is based on the 1989, 1992, 1995, 1998, and 2001 Surveys of Consumer Finances (SCFs). Legislative activity during this period reduced the forward-looking tax disadvantage of bequests relative to gifts. Moreover, the magnitude of this reduction differed systematically across identifiable household categories. This suggests that it is possible to estimate the effects of interest by measuring the change in gift giving over time, and then comparing these changes across categories. This procedure eliminates potential biases resulting from fixed, unobserved characteristics that vary systematically with effective tax rates across household categories.

We find that households experiencing larger declines in the expected tax disadvantages of bequests reduced gift giving relative to households experiencing smaller declines in the tax disadvantages of bequests. Our estimates, based on empirical specifications that control for a variety of potentially confounding factors, such as systematic changes in the fraction of wealth attributable to unrealized capital gains, are consistent with the hypothesis that the timing of transfers is responsive to applicable gift and estate tax rates.

2. Estate and gift tax background

US estate and gift taxes share a common progressive rate schedule and a unified lifetime exemption. Although the "unified" estate and gift tax creates the superficial appearance that gifts and bequests are treated equally for tax purposes, there are a number of important differences (see Joulfaian, 2000, for more details). Gifts receive favorable treatment relative to bequests under current tax law for at least three reasons. First, transfers of up to $10,000 (indexed for inflation beginning in 1998) per year for each unique donor–recipient pair are exempt from taxation, and do not count against the lifetime unified exemption.[4] Second, taxes on gifts are assessed on a tax-exclusive basis while taxes on bequests are assessed on a tax-inclusive basis. This means that if the marginal tax rate for estates is e, the corresponding rate for gifts is $e/(1+e)$. Thus, a dollar of gifts benefits the recipient more than a dollar transferred as a bequest, as long as the

[4] An unlimited exemption also applies to gifts of tuition and medical expenses.

marginal estate tax rate exceeds zero. Third, it is more tax-efficient to exhaust the unified exemption by giving gifts early in life rather than by making bequests at the end of life, since early transfer avoids subjecting future earnings and capital appreciation to estate and gift taxation.

The tax system confers at least one important offsetting advantage upon bequests: for the purpose of computing personal income taxes, the basis of an appreciated asset is "stepped up" to market value when the asset is bequeathed, but not when it is given as a gift. As a consequence, the recipient never pays capital gains taxes on past accumulations associated with bequeathed property. In contrast, the sale of an asset received as a gift triggers capital gains tax liabilities on all past accumulations, including those occurring before the date of the transfer. These provisions reduce the attractiveness of gifts relative to bequests.

Previous studies conclude that, on balance, the tax system ordinarily provides strong incentives to transfer resources through gifts rather than bequests (McGarry, 2001; Poterba, 2001). It is straightforward to show that the advantage of making an inter vivos transfer relative to a bequest increases with the estate tax rate (e). For an appreciated asset, this advantage increases with the asset's cost basis (since the value of basis step-up is lower) and declines with the capital gains tax rate (Bernheim et al., 2001, provide a complete discussion).

A tax policy change that eliminates or reduces a household's exposure to estate taxation has two effects on the frequency of gift giving. The first is a price effect: as e falls, the household's incentive to make inter vivos transfers declines. The second is a wealth effect: transfers may be sensitive to the level of after-tax resources. If gift-giving is a normal activity, these effects work in opposite directions. However, if the price effect is sufficiently strong, the frequency of gift-giving should be positively correlated with the applicable rate of gift and estate taxation. A central purpose of our empirical analysis is to examine this relationship.

3. Identifying the effects of estate tax changes on inter vivos transfers

This study uses time series variation in applicable tax rates and expectations. Marginal estate and gift tax rates are high, starting at 37% and rising to 55% for taxable estates exceeding $3 million in 2000.[5] The unified exemption was $600,000 (nominal) from 1986 through 1997. Simple estate planning permits married couples to shelter an amount equal to twice the exemption. Tax legislation enacted in August 1997 (TRA97) increased the unified exemption in stages to $1,000,000 in 2006 (with indexation for inflation thereafter). When deciding whether to give gifts in 1997 or retain resources until death, couples expecting at least one partner to survive past 2006 saw the value of the unified estate and gift tax exemption increase immediately to $2 million from $1.2 million. New

[5] The marginal rate was 60% for estates between $10 million and $17.184 million in 2000. The object of this provision was to "claw back" the benefit of inframarginal tax rates below 55%, and thereby produce average tax rates of 55% for estates over $17.184 million.

legislation in 2001 (EGTRRA) increased the unified exemption to $1 million in 2002 and, in stages, to $3.5 million by 2009. Estate transfer taxes are scheduled for elimination in 2010, at which point the gift tax rate will coincide with the top individual income tax rate. In 2011, the law specifies that rules in place as of 2001 will be reinstated (see Burman and Gale, 2001, for additional details). The phasing out of the estate tax by 2010 and reinstatement at 2001 levels in 2011 complicates estate planning for couples (singles) who anticipate holding estates worth more than $2 million ($1 million).

TRA97 also lowered the maximum tax rate on capital gains from 28% to 20%, thereby reducing the value of stepping up the basis of appreciated assets at death. In cases where an individual was considering shifting an appreciated asset between bequests and gifts, this reduced the advantages of bequests, thereby counteracting the effect of the expanded unified credit. Thus, according to theory, the level of giving could have either risen or fallen in response to TRA97. However, since it is tax efficient to transfer unappreciated assets as gifts before transferring appreciated assets, and since virtually all donors have *some* unappreciated assets, the countervailing capital gains tax effect does not apply to the first dollar of gifts. Theory therefore predicts that TRA97 should have reduced the *frequency* of inter vivos giving.

The effects of TRA97 on the incentives to give gifts rather than bequests varied systematically across identifiable segments of the population. Those who expected their bequests and taxable transfers to fall below the original $600,000 exemption were unaffected. All else equal, we would not expect to observe a substantial change in the composition of transfers for this first group of households. Those who expected their bequests and taxable transfers to be above the original exemption but below the new $1 million exemption experienced a substantial reduction in the effective marginal gift and estate tax rate, e. If the price effect is sufficiently strong relative to the wealth effect, we should observe a reduction in the frequency of gift giving among this second groups of households. EGTRRA (the 2001 budget legislation) did not further alter the incentives faced by the first and second groups.

A third group of households expected their bequests and taxable transfers to exceed the exemption before and after the passage of TRA97. As a result of this legislation, these households benefited from a positive wealth effect, which should have stimulated gift giving.[6] Depending on expectations of life expectancy and future estate tax developments, EGTRRA decreased incentives for some group-three households to make inter vivos transfers, by increasing the estate tax exemption from 2002 through 2009 and repealing the estate tax in 2010. Given wealth effects and the EGTRRA changes in marginal incentives, we have ambiguous predictions about changes in the frequency of giving for households in group 3 relative to households in group 1.

[6] As noted earlier, the tax code prior to TRA97 included a "clawback" provision designed to ensure that very large estates were subject to an average tax rate of 55%. TRA97 altered the structure of the clawback provision to ensure that very large estates were subject to an average tax rate of 55% on net value *in excess* of the exempted amount. Consequently, the 1997 legislation created a wealth effect for all households in the third group. For some of these households (those considering shifting appreciated assets between gifts and bequests on the margin), there was also a price effect resulting from the reduction in the capital gains tax rates. The price effect should have further stimulated gift giving for some households in the third group.

It is also important to acknowledge that the *expected* tax disadvantages of bequests almost certainly began to decline well before August 1997. During the first part of that year, House Speaker Newt Gingrich identified estate tax relief as one of the three top Republican tax priorities. Other key lawmakers, including the Senate Majority Leader, Senate Majority Whip, Finance Committee Chairman and House Ways and Means Committee Chairman campaigned aggressively and publicly for an expansion of the unified exemption.[7] The popular press actively covered these efforts, describing them as "aggressive" and "surprisingly successful" well in advance of adoption.[8] At a minimum, it seems likely that estate planners and tax accountants were aware of these developments, and early in 1997 were advising their clients to act appropriately (e.g. by delaying planned gifts that they would choose not to make if the law changed).

A closer examination of legislative activity suggests that wealthy households (or their financial advisors) could have reasonably anticipated future increases in the unified gift and estate tax exemption as early as 1993. In that year, Representative Chris Cox (R, CA) introduced legislation to abolish the estate tax, and advocacy organizations, such as 60-Plus, began lobbying for related reforms.[9] Raising the unified exemption was an element of the highly publicized Contract with America when Republicans took control of the House of Representatives in 1994 for the first time since the Truman Administration.[10] Consequently, between 1993 and mid-1997, transfer behavior may have changed in response to evolving expectations.

4. Data

We examine the relationship between estate and gift taxes and inter vivos transfers using data from the 1989, 1992, 1995, 1998, and 2001 SCFs. These surveys are independent cross-sections, and are fielded every 3 years (beginning in 1983) by the Board of Governors of the Federal Reserve System. They gather detailed information on the assets and liabilities of a random, stratified cross-section of American families. The SCFs intentionally oversample wealthy households, which is critical for our purposes. They are widely regarded as the most reliable sources of information on the financial portfolios of US households.

All of the SCFs starting in 1989 share a similar structure. Each gathers extensive information on assets, liabilities, and demographic characteristics for samples of roughly 4000 households. In addition, all of these surveys include questions concerning financial support provided to individuals who are not members of the household.[11] Respondents are

[7] "Treasury Official Slams Estate Tax Rollback Effort," Clay Chandler, *Washington Post*, April 22, 1997, page C1.

[8] "GOP Inherits Momentum to Reduce Federal Estate Tax," Janet Hook, *Los Angeles Times*, April 19, 1997, page A11.

[9] See, for example, http://www.60plus.org/deathtax.asp.

[10] See http://www.house.gov/house/Contract/CONTRACT.html, specifically, the Job Creation and Wage Enhancement Act.

[11] The 1983 SCF did not gather information on this topic, and the pertinent questions in the 1986 survey are not consistent with the questions asked in later years.

first asked: "During [the previous year], did you (or anyone in your family living here) provide any (other [than alimony or child support]) financial support for relatives or friends who do not live here?" If the answer is yes, the followup question asks: "How much support did you (and your family) pay?" Subsequent questions indicate to whom the support is given. Answers to these questions provide the central focus for our empirical analysis.

The creators of the SCF provided five separate imputed values (replicates) for each missing variable.[12] They also selected 999 sample replicates from the final data in a way

Table 1
Descriptive statistics for the 1989 through 2001 SCFs

	1989 and 1992 SCF	1995 SCF	1998 SCF	2001 SCF		
Panel A. All households (*weighted*)						
Fraction of all households giving a transfer	0.121	0.125	0.116	0.127		
Mean transfer conditional on giving	5548	5498	5495	7470		
Median transfer conditional on giving	2687	2733	2044	3000		
	All households			Households aged 50–79, with kids, and at least $300,000 of net worth		
	Weighted mean	Weighted S.D.	Unweighted mean	Weighted mean	Weighted S.D.	Unweighted mean
Panel B						
Gave a transfer	0.122	0.327	0.176	0.234	0.423	0.322
Dollar value of transfer	725	5336	3972	3298	15,174	12,461
Age	46.6	17.2	47.8	62.1	8.3	61.3
Education: no high school degree	0.208	0.406	0.155	0.093	0.291	0.058
Education: high school degree	0.297	0.457	0.243	0.222	0.416	0.148
Education: some college	0.222	0.416	0.199	0.194	0.396	0.157
Education: college degree	0.156	0.363	0.202	0.218	0.413	0.290
Education: > college degree	0.117	0.321	0.201	0.272	0.445	0.346
Education: grad. or prof degree	0.100	0.300	0.183	0.239	0.426	0.322
Health of head of household is poor	0.082	0.274	0.064	0.056	0.230	0.040
Head of household is married	0.641	0.480	0.704	0.897	0.304	0.911
Head of household is widowed	0.109	0.311	0.084	0.106	0.308	0.076
Head of household is female	0.277	0.447	0.212	0.120	0.325	0.076
Household has no children	0.216	0.412	0.185	0	0	0
Net worth of household (in $1000)	280	1674	5228	1421	4500	15,817
Annual household income (in $1000)	56.5	234.5	428.0	133.7	566.9	1121.2
Percent of net worth in capital gains	0.257	0.301	0.273	0.288	0.218	0.323
Household received an inheritance	0.205	0.403	0.253	0.420	0.494	0.430
SCF observation year=1989	0.187	0.390	0.156	0.168	0.374	0.148
SCF observation year=1992	0.193	0.395	0.194	0.160	0.367	0.186
SCF observation year=1995	0.199	0.399	0.214	0.164	0.371	0.218
SCF observation year=1998	0.206	0.405	0.214	0.215	0.411	0.213
SCF observation year=2001	0.214	0.410	0.221	0.293	0.455	0.235
Fraction of sample in group 1	0.931	0.253	0.719	0.661	0.473	0.291
Fraction of sample in group 2	0.040	0.196	0.069	0.176	0.381	0.138
Fraction of sample in group 3	0.029	0.167	0.211	0.163	0.370	0.570

that allows users to capture important dimensions of sample variation (for details see Kennickell et al., 1996). The sample replicates are particularly useful because confidentiality concerns prohibit the release of information on the survey's stratification design. The results for all our regression-based analyses use both the five imputation replicates and the sampling replicates. We adjust standard errors for the imputation and sampling variance inherent in the SCF data.[13]

The top panel of Table 1 presents weighted tabulations of inter vivos transfers for the 1989, 1992, 1995, 1998, and 2001 SCFs (all dollar amounts are in 2001 dollars). Throughout the paper we pool the two sample years, 1989 and 1992, that precede serious discussions of estate tax changes. Across years, roughly 12% of households made an inter vivos transfer and the conditional mean ($5500) and median ($2500) transfers are roughly constant until the 2001 SCF, when they increase. Real net worth (not shown) increased sharply over the period, from an average (median) of $236,000 ($60,000) in the 1989/1992 SCFs to $396,000 ($86,000) in 2001.[14] The fraction of households with equity and the conditional mean and median value of equity also increased sharply over time as would be expected given the 1990s stock market boom. But the equity holdings of the typical (median) family were only $18,153 in the 2001 SCF. Consequently, the performance of the stock market during this period probably did not have a substantial effect on the behavior of the typical equity-holding household.

5. Classifying households

The empirical strategy outlined above requires us to place each household into one of three categories: those expecting to pay no transfer taxes under the statutes prevailing prior to TRA97 (the "old regime"), those expecting to pay transfer taxes under the old regime but not under TRA97 (the "new regime"), and those expecting to pay transfer taxes under both regimes (or at least until EGTRRA). We treat a household as expecting to pay transfer

[12] Missing values in the SCF are imputed five times by drawing repeatedly from an estimate of the conditional distribution of the data, as described in Kennickell (1998). As noted in the SCF documentation, multiple imputation offers two distinct advantages compared with single imputation. First, because multiple imputation yields multiple outcomes from a random process, it supports more efficient estimation than single imputation. Second, multiple imputation allows users to make straightforward estimates of the degree of uncertainty associated with the missing information. Interested readers should consult the SCF codebooks (http://www.federalreserve.gov/pubs/oss/oss2/scfindex.html) and the citations therein for additional details.

[13] The 1998 SCF codebook (http://www.federalreserve.gov/pubs/oss/oss2/98/codebk98.txt) provides the following example: "To estimate the sampling variance of the mean of family income, for example, a user would estimate the mean 999 times using the replicate weights and compute the standard error of that estimate. An estimate of the total standard error attributable to imputation and sampling is given by SQRT((6/5)*imputation variance+sampling variance)".

[14] Net worth equals the sum of financial and physical assets, less liabilities. It includes balances on defined benefit retirement vehicles and thrift plans, as well as the current cash value of whole life insurance policies (but not death benefits associated with whole or term life insurance policies). It does not include claims to future social security payments. In calculating net worth, we do not subtract potential penalties and taxes that individuals would pay if they liquidated 401(k), IRA, or thrift balances to make inter vivos transfers.

taxes if its projected estate exceeds the applicable unified exemption. That is, we classify each household according to whether its projected estate is below the original exemption ("group 1"), between the original exemption and the new exemption ("group 2"), or above the new exemption ("group 3").

To implement this classification system, we must resolve two practical issues. First, since TRA97 and EGTRRA phased-in estate tax changes, it is not clear what post-change estate tax schedule affects households' transfer behavior. Second, we must settle on a method or methods for projecting each household's estate.

With respect to the first issue, we note that the life expectancy of almost every household in the 1998 SCF extended well beyond 2006.[15] It is therefore reasonable to assume that, for all but the oldest and sickest households in the SCF, expected estate tax liabilities after TRA97 were governed primarily by the fully phased-in provisions. Accordingly, we use $1,000,000 for single individuals and $2,000,000 for couples as the applicable unified exemptions under the new regime.[16] Modeling the EGTRRA changes is more challenging, but recall that the 2001 SCF collects transfer information for calendar year 2000. Consequently, group 3 households might have reasonably anticipated reductions in their eventual estate tax liabilities, but no statutory changes occurred for these households between the 1998 and 2001 SCFs.

The second issue (of classifying households) is potentially more problematic. In practice, households may be uncertain about the size of their ultimate bequests. Even so, changes in expectations concerning estate taxes over the time period in question should be systematically related to reasonable forecasts of these estates.

We use three strategies for predicting the value of a household's estate at death. In our favored approach we use estimated age–wealth profiles along with life tables to predict the expected value of the estate for each household.[17] Specifically, we estimate quantile regressions relating the 10th, 30th, 50th, 70th, and 90th percentile values of net worth as functions of age and age squared, income and income squared, equity value, and binary variables measuring educational achievement, marital status, number of children, previous receipt of an inheritance, decade of birth, business ownership, and year of survey.[18] We then place households into net worth quintiles based on current net worth and age. Using the age coefficients from the appropriate quantile regression (10th percentile for households in the first quintile, 30th percentile for households in the second quintile, and so on), we then adjust each household's net worth based on an estimate of the median date at which the bequest will occur. This estimate is derived from the 1998 life expectancy tables published by the Center for Disease Control.

[15] In 1998, life expectancies for single men under the age of 80 and single women under the age of 83 extended beyond 2006. The likelihood that at least one member of a married couple would survive past 2006 was significantly higher than the corresponding likelihood for individuals (http://www.cdc.gov/nchs/).

[16] For the purpose of determining the applicable unified exemption, widows are treated as married, and cohabitating individuals are treated as single. This treatment is consistent with estate tax provisions.

[17] Holtz-Eakin and Marples (2001) carry out a similar procedure using the Health and Retirement Survey.

[18] Complete results for each specification mentioned in the paper are available on request.

The second approach addresses a concern that arises from potential behavioral responses to estate taxation. The validity of our favored approach depends on the assumption that the policy variable (the estate tax) does not influence the classification variable (net worth).[19] We address this concern by estimating a specification that classifies families based on educational attainment rather than by projected net worth. Educational attainment is almost certainly exogenous with respect to the estate tax reforms.[20] It is also highly correlated with net worth and saving behavior and consequently with the likelihood that a family will be subject to estate taxation.

To implement this approach, we split the sample into those with an advanced degree (i.e. MA, MBA, Ph.D., DDS, Law, etc.), and all other families. Ten percent of the sample falls into the advanced degree category. This classification scheme is, of course, rather crude. Many highly educated households are not subject to estate taxation. And among households without advanced degrees, some accumulate sufficient wealth to trigger estate tax liabilities. Moreover, by using educational attainment to identify households more and less likely to be affected by the estate tax, we lose the ability to identify changes in the behavior of distinct groups—those never affected by estate tax changes because they have too little wealth, those not affected at the margin because they are always subject to the tax, and those who are affected at the margin by the TRA97. Nevertheless, classifying households by educational attainment provides an important alternative specification check.

For the third method, we simply set each household's projected estate equal to its current net worth. Since wealth tends to change rather slowly with age, and since the classification brackets are extremely wide ($0–1,200,000; $1,200,000–2,000,000; and over $2,000,000 for married couples), transitions between categories are relatively uncommon. Nevertheless, this procedure may systematically misclassify some observations. In particular, current wealth may tend to understate the value of estates at death for young wealth-accumulating households, and to overstate the value of estates for older (and generally wealthier) wealth-decumulating households. Hence we have somewhat less confidence that this approach accurately allocates households across groups.

6. Regression analysis

Our central empirical model examines the extent to which the frequency of giving differs over time across household groups, defined by their predicted net worth at the time of death, controlling for other variables that potentially influence transfer decisions. We

[19] As noted by Heckman (1996) in the labor supply context, problems arise if estate taxation causes families to switch between groups. Suppose, for example, that families in the upper range of group 1 under the old regime increase net worth in response to TRA97. Under the new regime, they may find themselves in the low range of group 2. If the probability of giving is related to underlying tastes for accumulating wealth, this compositional change could produce apparent "policy effects", even if the estate tax does not influence the probability of making a transfer. The direction of the resulting bias is indeterminate.

[20] Other studies make similar assumptions concerning the exogeneity of education. See, for example, Blundell et al. (1998), who examine the effects of taxation on labor supply.

restrict the sample to households with net worth over $300,000 (in 2001 dollars) to make households in group 1 more comparable to households in group 2. We also require the head of household to be between the ages 50 and 79. Those younger than 50 are less likely to engage in estate planning. Those over 79 are more likely to die during the transition period established by TRA97, which makes it difficult to determine the appropriate level of the unified credit. Finally, we restrict the sample to households with children, since transfer motives are likely stronger for this group. We relax all these restrictions in subsequent sensitivity analyses.

Descriptive statistics for the samples used in the analysis are given in the bottom panel of Table 1. The columns on the right side of the table provide information on our primary sample. Columns on the left side of the table provide information for the full sample, which is used for sensitivity analysis. The SCFs oversample very high-wealth households, consequently sample means differ substantially depending on whether or not sample weights are used. In our regression-based analyses we use unweighted samples.[21]

Table 2 reports estimates of a probit model describing the decision to make a positive inter vivos transfer as a function of age, age squared, income, income squared, net worth, net worth squared, the percentage of net worth attributable to unrealized capital gains, and binary variables measuring educational achievement, health status, marital status, gender, previous receipt of an inheritance, year of survey, and household group. We also include six interaction terms: group 2 and 3 dummies multiplied by the dummies for the SCF survey years 1995, 1998, and 2001. The six interaction terms are the focus of our analysis. With the inclusion of group dummies, which control for time-invariant differences between the three household groups, and survey wave dummies, which control for baseline variation in giving over time, the interactions capture the extent to which behavior for groups 2 and for group 3 changed relative to group 1, using the 1989 and 1992 surveys as a baseline and subsequent surveys as comparisons. If transfers are sensitive to estate and gift taxation, then, compared with group 1, the probability of making an inter vivos transfer for group 2 should have been lower in the 1998 and 2001 SCFs than in the 1989 and 1992 SCFs, and may also have been lower in the 1995 SCF, due to increasing confidence concerning the likelihood of estate tax relief. We would not, however, necessarily expect to see a significant shift over time in the frequency of gift-giving in group 3 relative to group 1.

Relative to group 1, the probability of making an inter vivos transfer for group 2 fell by 4.5 percentage points between the 1989/1992 and 1995 waves, by 10.8 percentage points between the 1989/1992 and 1998 waves, and by 13.7 percentage points between the 1989/1992 and 2001 waves.[22] The difference is statistically significant for the 1998 versus 1989/

[21] See Deaton (1997) for a nice discussion of issues that arise in weighting regression analyses using microdata.

[22] These patterns are apparent in the raw data used for Table 2. For group 1, the fraction of respondents making inter vivos gifts was 0.22 in the 1989/1992 SCFs; 0.18 in the 1995 SCF; 0.16 in the 1998 SCF, and 0.23 in the 2001 SCF. In contrast, for group 2, these corresponding fractions were 0.41 in the 1989/1992 SCFs; 0.20 in the 1995 SCF; 0.14 in the 1998 SCF; and 0.15 in the 2001 SCF. Thus, after the 1989/1992 SCFs, the frequency of giving among group 2 households fell relative to the frequency among group 1 households. For group 3, the fractions were 0.34 in the 1989/1992 SCFs; 0.44 in the 1995 SCF; 0.35 in the 1998 SCF; and 0.40 in the 2001 SCF.

Table 2
Marginal effects on the probability of making an inter vivos transfer (probit regressions)

	Marginal effect	Standard error	*t*-statistic
Age	−0.059	0.013	4.361
Age^2/100	0.045	0.011	4.169
High school degree	0.013	0.036	0.367
Some college	0.067	0.037	1.795
College	0.058	0.035	1.637
More than college	0.130	0.035	3.698
Poor health	0.022	0.032	0.686
Married	−0.037	0.027	1.399
Widow	−0.013	0.033	0.379
Female	−0.029	0.033	0.870
Ever received inheritance	0.004	0.013	0.326
Net worth	5.22e-07	2.14e-07	2.439
Income	6.17e-07	1.94e-06	0.318
Percent net worth in capital gains	0.011	0.025	0.415
SCF year=1995	−0.027	0.034	0.794
SCF year=1998	−0.074	0.035	2.100
SCF year=2001	−0.010	0.041	0.245
Group 1	−0.093	0.034	2.769
Group 3	0.053	0.033	1.582
Group 2 * SCF year=1995	−0.045	0.060	0.764
Group 2 * SCF year=1998	−0.108	0.049	2.193
Group 2 * SCF year=2001	−0.137	0.051	2.675
Group 3 * SCF year=1995	0.066	0.040	1.667
Group 3 * SCF year=1998	0.015	0.041	0.374
Group 3 * SCF year=2001	−0.008	0.041	0.201

Household groups are defined by their projected estate value, as discussed in the text. The data are restricted to households with children, with at least $300,000 in 2001 dollars of net worth, and are in their 50s, 60s, or 70s. Standard errors account for the sample and imputation variance inherent in the SCF data. Data for regressions are unweighted.

1992 comparison and the 2001 versus 1989/1992 comparison, but not for the 1995 versus 1989/1992 comparison.[23] Recall, we expect households in group 3 to not be affected by the changes in the estate tax (or, at least to be affected less than group 2 households). Relative to group 1, the probability of making an inter vivos transfer for group 3 rose between the 1989/1992 and 1995 waves, as well as between the 1989/1992 and 1998 waves, but declined slightly between the 1989/1992 and 2001 waves. None of the group 3 differences are statistically significant and Wald-tests reject the hypothesis that that difference in the group 2 and group 3 coefficient is zero for each of the 3 years (*P*-values are 0.0440, 0.0070, and 0.0080 for 1995, 1998, and 2001, respectively). These findings are consistent with the hypothesis that estate tax changes significantly reduced the likelihood

[23] While the group 2 interaction coefficients differ significantly from the 1989/1992 baseline in 1998 and 2001, Wald-tests of the coefficients indicate that the coefficients from 1995, 1998, and 2001 do not differ significantly from each other at usual levels of confidence.

of inter vivos transfers for group 2 and did not significantly affect the likelihood of inter vivos transfers for group 3.[24]

The other coefficients in Table 2 are generally sensible. The age coefficients imply that the frequency of giving in our sample falls until just over age 65 and then increases. The likelihood of an inter vivos transfer rises with education and net worth. Group 1 has a lower baseline level of giving than group 2, while group 3 has a higher level of giving. The year dummies show no systematic trend, though the probability of giving is lower after conditioning on the other covariates in 1998 than it is in the other survey waves.

Thus far, our discussion has focused exclusively on the *frequency* of transfers. We have also estimated tobit specifications explaining the level of gifts, but that are otherwise analogous to the probit model in Table 2. The coefficients for the group 2 interactions terms are −9696 (*t*-stat of 0.68) for 1995; −18,532 (*t*-stat of 1.44) for 1998; and −31,119 (*t*-stat of 1.88) for 2001. The coefficients for the group 3 interactions terms are 14,038 (*t*-stat of 1.62) for 1995; 8430 (*t*-stat of 0.89) for 1998; and −381 (*t*-stat of 0.04) for 2001. Thus, the results for the levels specification are less precisely estimated, but are qualitatively similar to the results for the probability of giving.

7. Robustness and sensitivity

We explored the sensitivity of our results to a variety of alternative specifications and report their key interaction-term coefficients in Table 3 (complete results for all specifications are available from the authors on request). In panel A, we retain the classification approach used in Table 2 (households are placed into groups based on their predicted net worth at the time of death). The first specification (Panel A, left column) removes sample restrictions related to net worth, age, and the presence of children. The group–year interaction terms differ somewhat from the pattern shown in Table 2. All the group 2 coefficients are negative and significantly different from the 1989/1992 SCF baseline. A Wald-test indicates the 1998 coefficient is marginally significantly different (at the 11% level) from the 1995 coefficient. The group 3 coefficients are not significantly different from the 1989/1992 baseline in 1995 and are significantly different from the 1989/1992 baseline in 1998 and 2001. The reduction in the probability of making a transfer for group 3 is roughly 3 percentage points relative to group 1. Moreover, the hypothesis that the response by group

[24] The key coefficients are similar when we also exclude households with interests in closely held businesses exceeding $50,000, though they are less precisely estimated than in the Table 2 specification (the group 2-year coefficients are significant at the 12% and 6% levels in 1998 and 2001). This restriction is motivated by the observation that, in 1997, Congress enacted a larger increase in the estate tax exemption for farmers and owners of closely-held business than for other taxpayers. We also estimated a similar specification using the first four waves of the Heath and Retirement Survey (HRS). The HRS is not ideal for this analysis because it did not oversample affluent households. Moreover, questions about transfers changed between the second (1994) and the third (1996) waves of the survey, so one can only make valid comparisons between waves 1 and 2, and between waves 3 and 4. The probability of giving for group 2 fell by 2.5 percentage points between 1990–1991 and 1992–1993 relative to groups 1 and 3, and by 5.5 percentage points between 1994–1995 and 1996–1997. Both estimates are statistically significant. Like the SCF, the HRS results suggest the probability of making inter vivos transfers for group 2 fell relative to other groups and the magnitude of these changes increased over time.

Table 3
Selected marginal effects on the probability of making an inter vivos transfer (probit regressions)

	Household groups defined by projected estate value: (households: all; transfers: all)			Household groups defined by projected estate value: (households: all; transfers: at least $2,000 given to a younger or same generation)		
	Marginal effect	Standard error	*t*-statistic	Marginal effect	Standard error	*t*-statistic
Panel A						
Group 2×SCF year=1995	−0.045	0.018	2.519	−0.032	0.011	2.995
Group 2×SCF year=1998	−0.080	0.018	4.557	−0.037	0.011	3.507
Group 2×SCF year=2001	−0.048	0.020	2.401	−0.033	0.012	2.839
Group 3×SCF year=1995	−0.007	0.014	0.524	−0.007	0.008	0.837
Group 3×SCF year=1998	−0.033	0.014	2.447	−0.012	0.009	1.360
Group 3×SCF year=2001	−0.029	0.012	2.331	−0.021	0.007	2.881
	Household groups defined by education: (households: have children, aged 50–79, net worth of at least $300,000; transfers: all)			By education: (households: all; transfers: all)		
	Marginal effect	Standard error	*t*-statistic	Marginal effect	Standard error	*t*-statistic
Panel B						
Advanced degree×SCF year=1995	0.017	0.036	0.465	−0.009	0.013	0.740
Advanced degree×SCF year=1998	−0.098	0.033	3.015	−0.050	0.012	4.256
Advanced degree×SCF year=2001	−0.075	0.030	2.520	−0.035	0.011	3.175
	Household groups defined by current net worth: (households: have children, aged 50–79, net worth of at least $300,000; transfers: all)			Household groups defined by current net worth: (households: all; transfers: all)		
	Marginal effect	Standard error	*t*-statistic	Marginal effect	Standard error	*t*-statistic
Panel C						
Group 2×SCF year=1995	−0.036	0.069	0.527	−0.048	0.022	2.132
Group 2×SCF year=1998	−0.097	0.045	2.168	−0.068	0.018	3.797
Group 2×SCF year=2001	−0.032	0.051	0.625	−0.036	0.019	1.857
Group 3×SCF year=1995	0.091	0.039	2.354	0.016	0.016	1.024
Group 3×SCF year=1998	0.053	0.038	1.385	−0.011	0.015	0.722
Group 3×SCF year=2001	0.050	0.042	1.197	−0.006	0.014	0.409

Standard errors account for the sample and imputation variance inherent in the SCF data. Data for regressions are unweighted. The full set of regression results is available from the authors upon request.

2 and group 3 households is the same is rejected in 1995 (the *P*-value is 0.0561) and 1998 (the *P*-value is 0.0112). Unlike in Table 2, however, the effect in 2001, though less in absolute terms for group 3 than group 2, does not differ significantly between the two groups (the *P*-value is 0.4225).

The second specification (Panel A, right column) excludes transfers made to grandparents, parents, aunts and uncles. When households make transfers to elderly parents or other relatives, future bequests are presumably not substitutable for current gifts. To ensure that our results describe decisions concerning economically significant transfers, we also limit attention to gifts exceeding $2000 (in 2001 dollars). The key qualitative patterns remain.[25]

Further analysis reveals that the differences between the results in Table 2 and those in Panel A of Table 3 are primarily attributable to the treatment of two groups: young households (age of head under 50) and those with projected net worth below $300,000. Since younger households are less likely to respond to changes in the estate tax, and since households with low wealth are less comparable to those in groups 2 and 3, we regard the results in Table 2 (where we exclude these groups) as more reliable.

In Panel B of Table 3, we classify households based on the attainment of an advanced degree rather than projected net worth. For the specification in the left column we use the same sample restrictions as found in Table 2. For the specification in the right column, we include all households. Using the restricted sample, we find that the probability of making an inter vivos transfer for group 2 fell, relative to group 1, by 9.8 percentage points between the 1989/1992 and 1998 waves, and by 7.5 percentage points between the 1989/1992 and 2001 waves. Using the full sample, the corresponding figures are 5.0 and 3.5 percentage points. All of these effects are statistically significant. These qualitative patterns are robust across a wide range of different alternative sample restrictions. Assuming those with advanced degrees were more likely to benefit from the increased unified exemption under TRA97, these patterns are also precisely what one would expect to find if estate taxation encourages inter vivos giving.

In Panel C of Table 3, we classify households based on net worth at the time of the survey, rather than projected net worth at death. For the specification in the left column, we use the same sample restrictions as in Table 2. For the specification in the right column, we include all households. The results are somewhat mixed. Relative to group 1, giving among group 2 fell between the 1989/1992 and 1998 waves, but the effect weakened noticeably by the 2001 wave.[26] Classifying households based on current wealth may obscure the effects of interest by confounding them with age effects.

On balance, the evidence is a bit mixed, but generally supports the hypothesis that changes in estate taxation significantly affect inter vivos transfers. Any alternative explanation must account for the fact that the observed changes in the frequency of giving were non-monotonic in wealth (that is, the change for group 2 was larger than the

[25] In a specification not shown, where we confine attention to inter vivos transfers over $2000 and restrict the sample to households with children, net worth exceeding $300,000, and age of head between the ages 50 and 79, only the 2001 group 2 interaction term is statistically significantly (the coefficient is −0.11 and the associated *t*-statistic is 2.17).

[26] The hypothesis that there is no difference in the group 2 and group 3 effects is again rejected with a *P*-value of 0.0501 in 1995 and 0.0031 in 1998 for the left side of panel C. In 2001, the *P*-value increases to 0.1048. The *P*-values for the right side of panel C are 0.0114, 0.0063, and 0.1722, respectively.

changes for groups 1 and 3). Unobserved factors that are, for example, correlated with wealth would not produce this non-monotonic pattern.[27]

One potential alternative explanation is that the results reflect spurious changes across years in the underlying composition of groups 1, 2 and 3. If, for example, the unusually strong performance of the stock market over the sample period, combined with the spread of 401(k)s among the middle class, resulted in significant migration of households from group 1 to group 2, this could account for the observed convergence in behavior across these groups. Since these developments presumably did not cause households to migrate across educational categories, we have already addressed this concern by demonstrating that our central findings are robust with respect to classifying households by educational attainment rather than wealth. Moreover, adding measures of portfolio composition (401(k) assets and housing wealth, either in levels or in portfolio shares) to the specifications in Tables 2 and 3 has little effect on our results. Finally, the evidence does not support the hypothesis that, as a general matter, the observable characteristics of group 2 became more similar to those of group 1 between 1989–1992 and 1998–2001.[28]

We have also estimated our regressions using SCF data on charitable gifts. Since an increase in the unified estate and gift tax exemption does not alter incentives to make gifts to tax-exempt charities, we would not expect to find an effect. Indeed, none of the patterns emphasized in the preceding discussion are present (see Bernheim et al., 2001, for details). This finding casts doubt on a potentially large class of alternative explanations that invoke spurious variation in unobserved characteristics (for example, anything related to general wealth effects or changes in the degree of altruism affecting group 2) since many of these alternative explanations would also have implications for charitable giving.

8. Conclusions

This paper contributes to a growing literature concerning the effects of estate taxation on economic behavior. Recent papers by Kopczuk and Slemrod (2001, 2003) examine the relationship between transfer taxes and, respectively, wealth accumulation and the timing of death. Joulfaian (1991, 1999) provides evidence that the estate tax influences charitable

[27] For example, the 1993 Omnibus Budget Reconciliation Act increased the top marginal tax rates to 36% and 39.6%, from 31%; repealed the income cap on Medicare taxes; increased the transportation fuels excise tax by 4.3 cents per gallon; increased the taxable portion of social security benefits; permanently extended the phaseout of personal exemptions and itemized deductions for high-income taxpayers; and created a 35% tax rate for corporations (Tempalski, 1998). Given the estimated effects are stronger for group 2 than for group 3, we think it is unlikely that the 1993 tax bill accounts for the patterns observed in this paper.

[28] Between 1989–1992 (pooled) and 1998–2001 (pooled), group 2 became more like group 1 in some respects, and less like group 1 in others. The fraction of households with 401(k)s increased by more for group 2 (from 16.2% to 40.8%) than group 1 (from 10.4% to 25.8%). Conditioning on 401(k) ownership has essentially no effect on the reported results in the regression analyses. The fraction with past inheritances fell somewhat more for group 2 (from 42.7% to 32.7%) than for group 1 (from 20.5% to 17.1%), the fraction with some college attendance increased by roughly the same amount for group 1 (from 44.9% to 48.5%) and group 2 (from 77.7% to 82.0%), the fraction with advanced degrees increased for group 2 (from 28.0% to 30.2%) and declined slightly for group 1 (from 8.4% to 8.3%), and average age changed slightly for group 1 (from 46.1 to 46.7) and group 2 (from 48.8 to 47.8).

bequests. McGarry (2001) and Poterba (2001) both document the fact that many households could reduce their estate and gift tax liabilities by making greater use of inter vivos transfers.

In this paper, we exploit time series and cross-sectional variation in effective rates of estate and gift taxation to measure the effects of these taxes on the timing of transfers. In particular, we compared changes in the frequencies of inter vivos transfers for families who were affected by the expansion of the unified exemption in 1997 to the corresponding changes for families who were not affected, or who were affected to a smaller extent. Our preferred specification suggests that the 1997 estate and gift tax changes reduced the likelihood of making inter vivos transfers by roughly 10–14 percentage points in 1997 and 2000, relative to what would have been observed in the absence of these changes. This effect is large, given that only 38% of these families made transfers in the baseline 1989/1992 SCF waves. The estimated effect is reasonably robust with respect to a variety of alternative specifications.

The responsiveness of transfers to changes in estate taxes provides additional evidence that bequests arise intentionally, at least for high net worth households, and are likely attributable to altruism, strategic interplay between families member, or some combination of the two.

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