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Robert Gordon
David Joulfaian
James M. Poterba

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Robert Gordon, David Joulfaian, and James M. Poterba
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ABSTRACT

Executors of estates for decedents in 2010 could choose between an estate tax regime and a basis carry-over regime. For most executors, this created a tradeoff between a current estate tax payment and a future capital gains tax liability for beneficiaries who inherited assets with carryover-basis. Various features of a decedent's estate, including the gross value of assets, outstanding debts, whether the decedent resided in a state with an estate tax, and the basis of assets held at the time of death, affected the relative tax burden under the two regimes. Some executors chose to file estate tax returns for decedents from 2010, but these estate tax filings resulted in very little estate tax revenue. Estate tax filers had more leverage, were more likely to be from a state with an estate tax or from married decedents, were less likely to have made lifetime gifts, and had larger charitable bequests – all factors that are associated with reduced estate tax liability. While it is not possible to tell definitively whether executors chose the most tax-efficient option when confronted with the two tax regimes, evidence from tax returns suggests that an increase of one percent of estate value in the difference between estate tax liability and prospective tax liability under the carryover basis regime reduced the likelihood of filing an estate tax return by between 0.3 and 1.5 percentage points.

Robert Gordon
Twenty-first Securities
780 Third Avenue
New York, NY 10017
and NYU Stern School of Business
bob@twenty-first.com

David Joulfaian
Department of the Treasury
1500 Pennsylvania Avenue, NW
Washington, DC 20220
and Department of Economics
Georgetown University
david.joulfaian@treasury.gov

James M. Poterba
Department of Economics, E52-444
MIT
77 Massachusetts Avenue
Cambridge, MA 02139
and NBER
poterba@nber.org

Under the terms of the 2001 Economic Growth and Tax Relief Reconciliation Act, the estate tax expired in 2010 and was replaced by a basis carryover tax regime. Rather than paying an estate tax, executors of estates of decedents in 2010 were required to report accrued gains on assets transferred at death. Heirs were subject to income tax on these gains if and when they sold the assets they received. On December 17, 2010, the estate tax was reintroduced for 2011 as part of the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010. The estates of decedents who died in 2010 were unexpectedly given the option of being taxed under the 2011 estate tax law, or under the basis carryover regime that had prevailed until new law was enacted.

For many estates, the total tax burden under the basis carryover regime was smaller than that under the estate tax regime, because the estate tax base is generally broader than that for the carryover regime, and because the capital gains tax rate in 2010 (15 percent) was lower than the estate tax rate of 35 percent. But specific estate characteristics matter, and the basis carryover regime does not uniformly dominate the estate tax regime. Choosing the estate tax option could be the lower-tax strategy for highly leveraged estates where debts are deductible under the estate tax but not so under the carryover regime, for estates of decedents from community property states in which the transfer at death escapes estate taxation while also benefiting from step up on both decedent and spousal share of property, and for taxable estates with total value only slightly greater than the estate tax exemption of $5 million. Perhaps for some of these reasons, the executors of some estates for 2010 decedents chose to file estate tax returns and to pay the associated estate taxes.

This paper explores how the availability of the basis carryover regime affected estate tax filing decisions, with the goal of learning whether executors chose between the two tax regimes

to minimize taxes. The analysis compares estate tax returns of decedents in 2010 to those from prior and subsequent years. Not surprisingly, the characteristics of the estates for which estate tax returns were filed in 2010 differ from those of the 2009 and 2011 filings. The 2010 estates are more indebted, bequeathed more to charity, made fewer lifetime gifts, and are more likely to be from married individuals living in a state with death taxes.

The tax returns filed in connection with the basis carryover tax regime provide additional information on the financial circumstances of decedents. While estate tax returns do not collect data on the purchase price of assets in the estate, since this information is irrelevant when basis is stepped up at death, the carryover basis returns include this information. The data suggest that unrealized gains represent 44 percent of the gross market value of assets reported on basis carryover returns. Carryover basis filers do not represent a random sample of decedents: they are likely to have larger unrealized gains relative to their total estate value. Nevertheless, the filings under the carryover basis regime offer a unique opportunity to learn about the potential revenue costs of basis step-up at death.

While the results suggest that executors were sensitive to the various tax trade-offs, it is not possible to test the hypothesis that they made tax-minimizing choices using the reported data. This is because the basis of assets held in estates is only reported for estates that filed under the basis carryover regime. If this information were available for all estates, it would be possible to calculate a measure of tax liability for each filing choice. It is possible to impute unrealized gains to estate tax returns, but the procedure developed here does not address the differential composition of estate and basis carryover filers on a number of dimensions.

The paper is divided into five sections. The first describes the estate tax and basis carryover tax regimes that prevailed in 2010. It also notes a number of estate attributes that

could significantly influence the relative burden of estate taxation and income taxation of unrealized gains. The second section describes the data on both estate tax filings and carryover basis filings that we analyze, and reports information on unrealized capital gains by asset type. Section three reports differences in the attributes of estate tax filers over the years 2009-2011. Section four presents further empirical evidence on how the attributes of decedents and their estates affected the choice between the estate tax and carryover basis regime, and explains how we impute information that is not reported on each set of returns to them. The fifth section concludes and suggests several further research questions.

I. The Parallel Tax Regimes of 2010: Carryover Basis vs. Estate Taxation

The tax environment confronting executors of estates for those who died in 2010 was different from that in any prior or subsequent year. It consisted of two different tax regimes, and the executor could choose between the two. Under the first, the carryover basis regime, unrealized capital gains on the assets in the estate would be taxable if and when they were realized by the decedent's heirs, but the estate was not subject to estate tax. Under the second, there was an estate tax associated with the asset transfer at death, but the basis of all inherited assets was stepped up to the market value at the time of the decedent's death. Whether the prospective capital gains tax liability under the basis carryover regime was larger than the estate tax liability under the estate tax regime depended on the particular circumstances in each estate. This section describes the key provisions of the two regimes and motivates our subsequent analysis of taxpayer choice between them.

A.Basis Carryover Regime

The basis carryover regime provided beneficiaries with some increase in the basis relative to that of the decedent. Executors were allowed to increase the basis of assets bequeathed to

non-spouse heirs by up to $1.3 million, or to their full market value (FMV), whichever was smaller. Assets transferred to surviving spouses benefited from an additional basis allocation of up to $3 million, again subject to the provision that the new basis not exceed FMV. When heirs sell inherited assets, they are taxed on the difference between the fair market value at the time of sale and this inherited basis. If inherited assets were sold immediately in 2010, then the carried over gains would have been taxable at a maximum long-term capital gains tax rate of 15 percent. The long-term capital gains tax rate on taxpayers in the top income tax bracket rose to 20 percent in 2013, and there was an additional 3.8 percent tax for married joint filers with taxable income of more than $250,000 and for single filers with taxable income of more than $200,000. This surtax was enacted as part of the 2010 Affordable Care Act.

While the long-term capital gains tax rate on corporate stock is often the focus of tax policy discussions, not all long-term gains are taxed at this rate. Long term gains on collectibles are taxed at 28 percent, recapture of depreciation on real estate at 25 percent, and recaptured gains on other assets at rates of up to 35 percent. Ling and Petrova (2015) illustrate how these rates can apply to an investment in commercial real estate; they estimate that for an eight year holding period in a typical property, the effective capital gains rate is approximately 30 percent.

For estates that were taxed under the carryover basis regime, the executor was required to report information on the cost basis and market value at death of each asset in the estate, its beneficiary, and the allocated basis increase associated with this asset. The only exceptions were bequests to charitable organizations, assets in retirement accounts, and cash-like assets that were not likely to generate capital gains.

There were noteworthy interactions between the carryover basis regime and two other institutions that affect transfers at death: community property rules and state estate and

inheritance taxes. With regard to community property, under the basis carryover regime, the surviving spouse does not receive a step up on her half of the assets, and she only receives an additional maximum $4.3 million adjustment to the basis of the community property. Thus, the carryover basis regime subjected any property in excess of the $4.3 million additional basis to possible future gains taxes. With regard to state taxes, carryover beneficiaries did not qualify for any deduction or increase in basis on account of these taxes when computing future taxable gains. Sixteen states levied death taxes in 2010. The state estate tax rate ranged from as low as 7 percent to as high as 19 percent, with many states at 16 percent. In comparison an estate tax filer could deduct state inheritance taxes.

B. Estate Tax Regime

The estate tax applies to the entire value of an estate without any allowances for basis, after providing an exemption (by virtue of the unified credit) of $5 million. The base for the estate tax includes cash and non-capital gains generating assets, such as assets in retirement accounts, which were not subject to taxation under the carryover basis regime. The taxable estate is the gross estate, defined as assets attributable to the decedent, less debts and mortgages. A multimillion dollar estate may not be taxable if it is encumbered by large outstanding debts. This is an important distinction from the basis carryover regime, under which debts and the source for funding used to acquire assets are irrelevant to the computation of taxable gains.

The estate tax and the gift tax are unified by virtue of the unified credit with a common rate structure and exemption. The estate tax is computed on cumulative transfers, with a credit for taxes paid on previous transfers. Consequently, the $5 million exemption is first applied to lifetime transfers in excess of the annual exclusion to calculate the gift tax. Any unused exemption is then applied to the estate tax. A decedent who made lifetime gifts in excess of $5

million would exhaust the exemption; his estate would be fully taxable. With regard to community property, half of such property is included in the decedent's estate and benefits from the marital deduction. In addition, both the decedent's and surviving spouse's share of the property receive a step up in basis.

Charitable bequests are treated in the same way under both the estate tax regime and the carryover basis regime. Under the estate tax, such bequests are deducted when computing the taxable estate. Under the basis carryover regime, bequeathed assets are not reported and beneficiary charities do not have to report the accrued gains on assets they receive.

The federal estate tax provides for a deduction for state death taxes. At a federal estate tax rate of 35 percent, a 16 percent state estate tax "costs' the heirs only 10.4%, or (1-0.35)*16, when an executor chooses the estate tax regime. In addition, state income taxes respect basis step-up associated with a federal estate tax filing. Thus, if an executor chose to file a federal estate tax return, then the basis step-up would take place for both federal and state income tax purposes. If, however, the executor elected the carryover basis regime, then the estate would not receive a basis step-up for future state income taxes.

For decedents who died in2010, executors had until September 19, 2011, to file estate tax returns for decedents, much longer than the usual 9 month due date. For those making the basis carryover selection, the associated filing -- Form 8939 -- was due November 15, 2011. This date was further extended to January 17, 2012.

C. Factors Affecting Relative Tax Liability: Estate Tax vs. Carryover Basis Regime

This section illustrates how the provisions of the estate tax and the carryover basis regimes determine the tax liability on particular estates, beginning with a hypothetical and simple estate, and then considering several special cases. Gordon, Joulfaian, and Poterba (2016a)

present the relative tax burdens for a longer set of illustrative estate configurations. Consider an estate of a single individual with assets valued at G with basis B. Assume that the estate tax rate is τ_e and that the estate benefits from an exemption E by virtue of the unified credit. The estate tax liability is $T_e = \max(0, \tau_e*[G-E])$.

Under the basis carryover regime, the taxable gain equals the difference between the value of assets (G) and their adjusted basis. Recall that additional basis A of $3 million is available to spouses, and additional basis of $1.3 million is available to other heirs. If the assets are sold as soon as the beneficiaries receive them, then the tax liability is $T_{cg} = \tau_{cg}*(G-B-A)$ or $T_{cg} = \tau_{cg}*(G-A)$ when basis is zero, where τcg denotes the applicable tax rate on gains. The choice of whether to select the estate tax or the basis carryover regime, which entails filing a Form 8939, depends on the tax rate differential between the estate and gains tax and the size of the respective exemptions and additional basis. If G is under $5 million, the estate tax is usually the optimal choice, because no estate tax will be due and the beneficiaries will receive basis step-up on inherited assets. More generally, the tax-minimizing strategy will involve filing an estate tax return whenever $\tau_e*(G-E) < \tau_{cg}*(G-B-A)$. Note that as basis (B) rises, filing the estate tax return becomes less attractive. As τcg rises, so the potential capital gains tax burden increases, filing an estate tax return becomes more attractive.

The calculation is different for an estate with outstanding debts. Consider the case of an estate with debt (D). The estate tax liability is computed as $T_e = \max(0, \tau_e*(G-D-E))$ while the basis carryover tax liability remains $T_{cg} = \tau_{cg}*(G-B-A)$. Debts do not reduce the estate's taxable gains. Choosing to pay the estate tax becomes more attractive, other things equal, as the estate's debt level rises. This is because the estate tax applies to net worth whereas the capital gains tax does not provide any tax relief for debt.

The foregoing calculations may also need to be modified if the decedent has made lifetime gifts. If L denotes the value of these gifts, then the estate tax is $T_e = \max(0, \tau_e*(G - D + \min(0, L - E))$. The potential capital gains tax liability in the basis carryover regime is not affected by the presence of lifetime gifts. Larger lifetime gifts increase an estate's potential estate tax liability, all else equal, by reducing the size of the available exemption. This makes filing an estate tax return less attractive.

If the decedent is married, in contrast, this reduces the estate's potential estate tax liability and makes choosing the estate tax regime more attractive. If M denotes the maximum tax-deductible spousal bequest, then the estate tax liability is $T_e = \max(0, \tau_e*(G - M - D + \min(0, L - E))$. A tax-free spousal bequest has the same effect on the estate tax burden as an increase in indebtedness or an increase in the estate tax exemption. Whether the decedent is married or single has no effect on the prospective capital gains tax liability under the basis carryover regime, unless the decedent lived in a community property state. In such a state, if all of the decedent's assets were community property and the couple's total assets were worth 2G, then the first—to-die spouse would have an estate worth G, and the tax-deductible spousal bequest is $M = G$. In a community property state, however, when the estate for the first-to-die files an estate tax return, the surviving spouse receives a step-up in basis on the decedent's share of the couple's assets and her own share. If the executor chooses the basis carryover regime, this means that the surviving spouse loses the step up on her share of the couple's assets, as well as on the decedent's share. The prospective capital gains tax liability associated with the choice of this regime, $T_{cg} = \tau_{cg}*[2*(G-B)-A]$, could be extinguished by choosing the estate tax regime This makes choosing the estate tax regime relatively more attractive, all else equal, for executors of married decedents in community property states.

II. Estate Tax Returns and Carryover Basis Returns

To explore whether the estate attributes identified above as affecting the relative attractiveness of choosing the estate tax rather than the carryover basis regime are correlated with observed tax filings, this study draws on two sources of data for 2010. For estates for which the executor opted to file an estate tax return, we have data from that return (Form 706). For estates for which the executor chose the carryover basis regime, we have information from Form 8939, Allocation of Increase in Basis for Property Acquired from a Decedent. Both forms provide very detailed information on portfolio composition. Form 706 provides information on asset characteristics, debts, and the disposition of the estate, as well as demographic information on the decedent such as age, marital status, and gender. Form 8939 provides similar information on the composition of assets, with some exceptions. For example, neither cash nor assets held in retirement accounts need to be reported on Form 8939, since neither asset category is subject to basis step-up. On many returns such information was reported, notwithstanding the absence of a legal requirement to do so. Form 8939 does not contain any information on debts outstanding. In addition, Form 706 includes information on discounted valuations and Form 8939 reports information on adjusted basis.

A. Estate Tax Filings

Data on estate tax returns, Form 706 filings, are obtained from information prepared by the IRS Statistics of Income (SOI) Division. Estate tax returns are typically filed about nine months after the date of death, though some are filed years past the required date. Estate tax returns are required to be filed when the gross estate plus lifetime taxable gifts exceeds a threshold; $3.5 million in 2009, and $5 million in 2010 and 2011. This amount is indexed in

later years, starting with a $5 million in 2011. The value for 2012, for example, was $5.12 million.

The data set analyzed here includes estate tax returns for decedents in 2009 through 2011 for which returns were filed between 2009 through 2013. Estate tax returns typically contain information on the size and asset composition of estates, demographics, estate expenses, and bequest divisions. The gross estate reported on Form 706 is very similar to gross assets, and is computed before subtracting any liabilities, state estate taxes, estate legal or administrative expenses, or deductions for spousal or charitable transfers.

In the data set prepared by SOI, the sampling rates for estates vary by year of decedent's death, the year the return was filed, the decedent's age, and the estate size (gross estate plus taxable gifts). Returns filed in 2009 were sampled at an average rate of about 30 percent, with sampling rates rising with estate size to 100 percent for the largest estates. Returns filed in 2010 through February 2012 were sampled at the 100 percent rate, regardless of year of death. After March 2012, returns were once again sampled by age and size of estate.

Notwithstanding the filing requirements, estate tax returns were filed for many estates for which the value of the estate was well below the filing threshold. In 2010, information in the IRS Master File suggests that 1063 tax returns were filed for estates valued at between $3.50 and $5.0 million. Return information from the Master File is typically not as detailed as that for return files that have been prepared by the SOI. Another 3493 returns were filed for estates valued at under $3.5 million. Because these returns fall under the filing threshold, they are not typically reported as part of the SOI sample. This pattern is not unique to returns filed for the 2010 year of death. Indeed, for the 2009 year of death, the total number of estate tax returns filed was 20,213, much larger than the number of returns above the filing threshold (7,948). One possible

explanation of this behavior is that executors file estate tax returns, even when no estate is due, to make use of the three year statute of limitations for IRS challenges.

Table 1 presents information on the number of estate tax returns in our sample. Returns are classified by the value of the gross estate plus taxable gifts. The table shows that returns with gross estate and gift value between $5 and $10 million account for nearly two thirds of the estate tax returns in 2009 but over 80 percent in 2010. There were just over one thousand estate tax returns with gross value of more than $20 million filed for decedents from each of 2009 and 2011, but only 146 such filings for decedents from 2010. The Internal Revenue Service (2015) provides a longer perspective on the number of estate tax returns filed and net estate tax revenue, and explores the decline in filings that was associated with the rising estate tax threshold between 2001 and 2011.

Table 1 shows the sharp change in the distribution of estate tax returns by size of gross estate, inclusive of taxable gifts, between 2009 and 2010. The number of estate tax returns with a gross estate of more than $20 million dropped by more than 85 percent, and the number between $10 and $20 million fell by nearly 80 percent. This suggests that the executors of many larger estates chose the carryover basis option rather than the estate tax option. In both cases, the number of estate filings rebounded to above the 2009 level for decedents who died in 2011. Means of various asset components and other variables associated with the estate tax returns that were filed in each of 2009, 2010, and 2011 are reported in Appendix Table A1.

B. Carryover Basis Tax Filings

This study also draws on data prepared by SOI on the estates for which Form 8939 was filed. These are the estates for which the executor chose the carryover basis regime. The data set consists of the universe of these filings. For each decedent, information is available on the fair

market value of assets (FMV), the basis of these assets, and the allocation of additional basis. Records are available for 8049 decedents, representing about 498,000 asset-beneficiary combinations.

Unlike estate tax returns, Forms 8939 do not provide information on the age of the decedent or on lifetime gifts. This information is obtained by matching Form 8939 returns first against date of birth records to compute age in 2010, and then against gift tax return master files for the years 2002-2010. The latter will not capture all gifts, since it omits those before 2002, but it provides some information on lifetime gifts.

Table 1 also presents information on the distribution of Form 8939 return filings by gross value of estate. The calculation of this gross value incorporates information on lifetime gifts and an imputation for cash-like assets, both of which are described in more detail below. The last row shows the number of carryover basis filings by estate value. The distribution of estates associated with estate tax returns was significantly different from that for Form 8939 filings. While half of the basis carryover filings corresponded to estates with gross value between $5 and $10 million, 82 percent of the estate tax filings fall in this range.

Estate tax returns include information on the attributes of assets, but not the basis when acquired. Since the Form 8939 filings include information on basis, they can be used to explore the distribution of unrealized capital gains in estates. The total value of unrealized gains as a share of the fair market value (FMV) of the estates filing forms 8939 was 43.6 percent. Gordon, Joulfaian, and Poterba (2016b) present detailed information on the differences in gains as a share of fair market value across asset categories; this information can be used to impute potential capital gains tax liabilities to the estates that filed estate tax returns. To illustrate the variation across asset classes, for the five asset categories that appear most often on Forms 8939, gains as

a share of FMV are 63.1 percent (corporate stock), 37.8 percent (personal residence), 4.3 percent (state and local bonds), 45.3 percent (real estate, except land), and 6.0 percent (corporate and foreign bonds).

III. Estate Tax Return Comparisons, 2009-2011

To explore how executors of 2010 decedents' estates responded to the opportunity to choose between tax regimes, we compare estate tax filings in 2010 with those in 2009 and 2011. If executors were choosing between filing estate tax returns or carryover basis returns based on the tax liability associated with the two options, then the estates that filed estate tax returns in 2010 should differ from those in 2009 and 2011. The foregoing descriptive evidence suggests that they did; there were many fewer large estate filings for 2010 decedents than for those in adjacent years. A simple linear model can summarize the cross-year differences in the attributes of estate tax returns filed in 2009, 2010, and 2011.

(1) $y_{it} = \alpha_0 + \alpha_1 * I_{2010,it} + \xi_{it}$.

The dependent variable is an estate attribute for estate tax return i for a decedent who died in year t, for example the share of closely held stock in the estate's total value. $I_{2010,it}$ is an indicator variable for an estate of a decedent who died in 2010. The coefficient α1 is the difference between the average attribute (y) for estate tax returns filed for decedents in 2009 and 2011, and that for the decedents who died in 2010.

Table 2 presents summary information for a number of different attributes of the estate tax filings. The first row shows the average value of the adjusted taxable estate in each year. The values for 2009 and 2011 are similar, $7.29 and $8.14 million respectively, but the value for 2010 is substantially lower: $3.86 million. The last column of Table 2 reports the estimate of the coefficient α_1 from equation (1). The estimate suggests that the average adjusted taxable estate

was $3.9 million smaller for 2010 decedents. The standard error of 0.42 indicates that the difference between the 2009/2011 sample mean, and the 2010 mean, is statistically significantly different from zero at very high confidence levels.

The second row of Table 2 presents a comparison of the total estate tax due for estate tax returns in each year. While the average estate tax liability was $1.67 million in 2009 and $1.17 million in 2011, it was only $50,000 in 2010. Most of the estate tax returns filed for that year owed little, or no, estate tax. This comparison is the most striking evidence that executors selected the tax regime to file under based on a comparison of potential tax liabilities under each. Even though there were a substantial number of estate tax returns filed for decedents who passed away in 2010, they yielded almost no estate tax revenue.

Several other characteristics of the estate also affect estate tax liability, and hence an executor's choice between the carryover basis and estate tax regimes, are also shown in Table 2. The third row reports the value of lifetime gifts. As noted above, all else equal, estates with larger lifetime gifts face higher estate tax liability. The value of lifetime gifts was $680,000 lower in 2010 than in the adjacent years, consistent with the view that estates with large associated gifts were more likely to choose the carryover basis regime. Table 3 also shows that decedents who died in 2010, and whose executors filed estate tax returns, were 8 percent more likely to reside in a state with an estate tax, and four percent more likely to live in community property states, than decedents from 2009 or 2011. In both cases, the null hypothesis that the filings for 2010 and the two adjacent years were drawn distributions with the same mean attributes can be rejected at very high confidence levels.

Table 3 presents information similar to that in Table 2, but limits the sample to estates with a gross value in excess of $20 million. Because the potential estate tax liability on an estate

with a larger gross value is greater, such estates must include very large unrealized gains relative to the taxable estate or exhibit other attributes that make the carryover basis regime especially expensive, in order to make filing an estate tax return the tax-minimizing choice for executors. The results in Table 3 are if anything more striking than those in Table 2. For example, the ratio of charitable bequests to wealth is 17 percentage points higher for the 2010 estate tax sample than for the samples from 2009 and 2011. Joulfaian (2014) reports that this is the highest ratio of charitable bequests to estate value in many years. Similarly, the probability of being married, and of living in a community property state, are both higher in the high net estate value sample than in the full estate return sample.

IV. The Sensitivity of Filing Choices to Expected Estate and Capital Gains Tax Burdens

This section further investigates the filing choices of executors by developing estimates of the potential estate tax liability, and the potential capital gains tax liability, for all estates for which either a Form 706 or a Form 8839 was filed in 2010. Unfortunately, the information available on the Form 8939 filing may not include information on all the assets in the estate, making it impossible to compute estate tax liability with certainty, and the information on the Form 706 filing does not include the basis of the assets in the estate, making it impossible to compute prospective capital gains tax liability with certainty. It is nevertheless possible to impute information from the complementary set of tax filings.

Imputations of the prospective capital gains tax liability for estate tax returns, under the carryover basis regime, require estimates of asset basis. These can be made using data from the estates that filed Form 8939, which reports the fair market value of assets and their basis. The ratio of gain to fair market value for 8939 filers, by asset category, can be imputed to estates that filed Form 706. This approach probably understates the gains for Form 706 filers, since the set

of estates for which Form 8939 was filed is not random, and is likely to have smaller unrealized gains than the set of estates that chose to pay estate tax. Modeling the potential selection into these two regimes and adjusting estimates of unrealized gains accordingly is beyond the current paper. Our imputation algorithm assumes that the observed Form 8939 filers are a random sample of all estates. We explored the robustness of this assumption by relating accrued gains as a share of an estate's fair market value to the characteristics of the decedent such as age, age squared, marital status, and the fair market value of the underlying asset. The resulting equations had very little explanatory power, and using them to adjust the imputed gains seemed likely to add noise. Therefore, Table 4 reports equations that use the sample average ratio of accrued gains to fair market value, by asset class, to impute the unrealized gains of Form 706 filers.

To compute the potential capital gains tax liability on assets that are included in carryover basis estates, the estimation algorithm applies the increase in basis of up to $3 million for spousal transfers, and the increase of up to $1.3 million on transfers to other beneficiaries. The resulting gains are then subjected to a capital gains tax of 15 percent, the rate applicable through 2012. The algorithm also imputes the value of assets that may have been omitted when executors filed Form 8939 for carryover basis estates, such as cash and assets held in retirement accounts. For retirement assets, we match the decedent's Form 8939 filing against the universe of Form 5498 filings in 2009 to obtain the market value of cumulated assets in individual retirement accounts, and then set the value of retirement assets as the maximum of that reported of Form 8939 and that reported on Form 5498. Information on estate tax returns for decedents in 2009 and 2011 is also used to impute the amount of cash-like assets associated with the estates that filed Form 8939 in 2010 and did not report any assets in this category. On estate tax returns, we define "cash" as the sum of cash, bank deposits, money market funds, and mortgages and notes held,

such as seller financed mortgages, that are unlikely to generate capital gains or losses. Data from Form 706 filers can be used to estimate a regression equation in which the dependent variable is the logarithm of "cash," and the independent variables are the logarithm of non-cash assets, an indicator variable for whether the decedent was married, the decedent's age and the square of age, and whether the decedent was male. The resulting estimates are:

$$\underset{}{\ln(\text{cash})} = \underset{(0.58)}{4.267} + \underset{(0.022)}{0.427}*\ln(\text{noncash}) + \underset{(0.043)}{0.011}*\text{Male} - \underset{(0.045)}{0.363}*\text{Married} + \underset{(0.012)}{0.048}*\text{Age} - \underset{(0.00008)}{0.0002}*\text{Age}*\text{Age} \quad (2)$$

Adjusted R2 = 0.025, sample size = 11,761

The estimates show that the value of non-cash assets in the estate is positively correlated with the value of cash in the estate. Cash holdings are generally rising with age, although at a declining rate. The coefficients from this regression equation, and the information on decedent age, gender, and marital status on the Form 8939 filing, along with the value of non-cash assets reported on Form 8939, are used to impute cash holdings to the Form 8939 filings.

We also try an alternative strategy to impute cash to Form 8939 filings, capitalizing capitalize interest income reported on the decedent's 2009 Form 1040 filing at a 3 percent interest rate, which is between the AAA and BAA interest rates for 2010. This capitalized value provides another potential estimate of cash-like assets which can be added to the value of assets reported on Form 8939 when the form does not report any cash-like assets. This is likely to be a noisy measure of the value of cash due to differences in the yield of the cash-equivalent assets held by different decedents, and because taxable interest income may include payments from bonds which are reported on Form 8939 showing capital gains or losses carried forward. The errors, however, are likely to be different than those that affect the imputations based on Form 706 data. Form 8939 does not report information on lifetime gifts, as Form 706 does. Because

these can affect estate tax liability in important ways, we obtained gift tax returns for the universe of filers between 2002 and 2010, computed the sum of lifetime gifts over this period for each decedent, and subtracted this sum from the $5 million estate tax exemption prior to computing potential estate tax liability.

These imputations provide sufficient information to compute an estimate of the estate tax liability (ET) and prospective capital gains tax liability (CGT) for each 2010 decedent with an estate of more than $5 million whose executor filed either of these returns. These values in turn can be used to estimate the difference in tax liability, scaled by the gross value of the estate reduced by charitable bequests. Note that charitable bequests are excluded for comparability; the estate values of Form 706 are net of such bequests, and the values on Form 8939 typically do not include charitable gifts. The tax variable of interest is

(3) TAXDIFF = (ET – CGT)/Gross Estate Value.

This measure scales the tax burden difference by the size of the estate.

The estimation sample consists of 6,257 returns; 35 percent of these estates filed an estate tax return. The estimating equation is a linear probability model, in which whether the estate filed a Form 706 (estate tax return) is related to age, age^2, indicator variables for whether the decedent was male, married, lived in a community property state, and the TAXDIFF variable. The estimating equation also includes a set of indicator variables for the value of the estate, divided into categories $5-10 million, $10-15 million, $15-50 million, $50-100 million, and greater than $100 million, as well as indicator variables for other estate attributes that our earlier analysis suggested were associated with selection between estate tax and carryover basis regimes such as whether the decedent lived in a state with an estate tax, whether the decedent had made lifetime gifts, and whether the decedent was married and resident in a community property state.

Table 4 presents the results. The TAXDIFF variable, which captures the difference between estate tax and projected capital gains tax liability, has a negative coefficient in all specifications. The magnitude of this coefficient is sensitive to the inclusion of controls for estate size. The estimates in the first column suggest that an increase in the difference between the estimated estate tax and the estimated capital gains tax liability of one percentage point of the estate value reduces the probability of filing an estate tax return by 1.5 percentage points. Including a set of indicator variables for estates in different size categories in the specification confirms large differences between the probability of filing an estate tax return for estates for which the value is between $5 and $10 million and those over $10 million. Including the indicators for estate size reduces the magnitude of the coefficient on TAXDIFF: the estimates in the second and third columns suggest that an increase in the estate tax liability minus capital gains tax liability of about one percent of estate value are associated with a decline of one half and one-third percentage point in the probability of filing an estate tax return, respectively.

Whether it is appropriate to focus on the coefficients from the specification with, or without, controls for estate size is not clear. The size of the estate is one of the most important factors determining the relative tax burden of the estate tax regime versus the carryover basis regime. Thus the coefficient estimate in the first column may be thought of as the effect of the tax differential inclusive of estate-size-related variation, while the second and third columns present the effect of tax variation conditional on estate size.

In the last column of Table 4, the cash imputation from Form 706 filings, for estates that filed Forms 8939, is replaced with an imputation based on the decedent's reported interest income in 2009. Although the coefficient on TAXDIFF is not sensitive to the assumed interest rate used to capitalize interest income, the absolute magnitude of the TAXDIFF coefficient is

smaller with this imputation than with the Form 706-based imputation. For Form 8939 filings that do not report any cash-like assets, the mean value of imputed cash is $0.61 million when estate tax filings are the source of the imputation, with a standard deviation of $0.432 million. The corresponding mean of the imputed values computed from capitalizing 2009 Form 1040 interest income is $1.866 million, with a standard deviation of $9.505 million. The much greater variation in the Form 1040 based imputations contributes to greater variation in the estimated estate tax liability under this imputation regime, and probably explains lower absolute value of the estimated coefficient. When the equation includes estate attributes other than estate size, the coefficient on TAXDIFF changes relatively little, but the coefficients on these variables suggest that they affect the probability of estate tax filing. This may indicate that the TAXDIFF variable is not fully capturing the richness of variation in tax liabilities across estates.

The coefficient estimate on the indicator variable for the presence of a state estate tax is 0.138, suggesting about a thirteen percentage point increase in the estate tax filing probability if a decedent lives in a state with a state estate tax. The effect of living in a community property state, for married decedents, is a 2.1 percentage point increase. If the decedent made lifetime gifts, the probability of filing an estate tax return is twelve percent lower than if there were no such gifts.

The finding of a statistically significant link association between the TAXDIFF variable and the observed pattern of estate and basis carryover regime filings suggests that the comparison between projected capital gains taxes, and estate taxes, played a key role in executors' decisions about whether or not to file an estate tax return. The finding that variables other than TAXDIFF that have important effects on potential estate vs. capital gains tax liability

are associated with the filing choice, even after controlling for TAXDIFF, suggests that this variable may not fully capture the tax liabilities under the two tax regimes.

V. Conclusion and Future Directions

The unique tax environment confronting executors of estates associated with decedents who died in 2010 provides a valuable opportunity to investigate the interplay between income taxation, estate taxation and taxpayer behavior. Executors had the choice between filing an estate tax return and paying estate taxes under the 2011 estate tax regime and stepping up the basis of bequeathed assets to their market value at the time of the decedent's passing, or avoiding the federal estate tax altogether while passing assets to beneficiaries with their original basis carried-over. The shifting pattern of estate tax filing for decedents who died in 2009, 2010 and 2011 suggests that executors were sensitive to the choice between these tax regimes. While the number of estate tax returns filed dropped from 7,949 in 2009 to 2,788 in 2010, estate tax revenues dropped much more sharply: from $13.5 billion to $0.2 billion. Most of the estate tax returns filed for 2010 decedents paid little, if any, estate tax. The estate tax returns that were filed were disproportionately associated with types of estates that would benefit from basis step-up and that would not face substantial estate tax liabilities. More of the 2010 estate tax returns were for married decedents, decedents who lived in states with estate taxes, and that included assets such as closely held stock and real estate for which the basis relative to fair market value was low, than for 2009 or 2011 decedents.

This paper investigates the determinants of executor behavior by constructing an estimate of the differential tax liability under the tax two regimes for the estates of each 2010 decedent. This requires strong assumptions to impute the unrealized capital gains on the assets in the estate of those who file estate taxes, and the assets without capital gains for estates that followed the

basis carryover regime. The imputation procedures do not allow for the potential selection of estates into these two filing categories as a function of their potential relative tax liabilities. These limitations notwithstanding, there is a strong association between the relative tax liability under the two tax regimes and whether the executor filed an estate tax return or a Form 8939. A key issue for future research is how allowing for this endogenous selection into the two regimes can be modeled, and ultimately be accounted for in the imputation of the differential potential tax liability.

One incidental contribution of this analysis is new evidence on the ratio of unrealized capital gains to fair market value for assets that are transferred through estates. Data from Form 8939 filings, which are selected toward estates with low levels of unrealized gains, suggests that unrealized gains account for 44 percent of the asset value. This estimate is a useful addition to the existing evidence on this magnitude drawn from surveys of older households and their asset holdings. Those surveys typically rely on self-reports of asset basis; the information on Form 8939 is likely to be more accurate. This information is an important input to estimates of the tax expenditure associated with basis step-up at death, as explained in Office of Tax Analysis (2014).

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Table 1: Estate Tax Returns Filed in 2009-2011 and Basis Carryover Returns Filed in 2010

Year of Death	Size of Gross Estate, Including Taxable Gifts				
	$5-10M	$10-15M	$15-20M	> $20M	Total For Estates > $5 Million*
Estate Tax Returns					
2009	5,151	1,247	504	1,046	7,948
2010	2,275	285	82	146	2,788
2011	5,981	1,536	562	1,206	9,285
Basis Carryover Returns					
2010	2,075	853	360	864	4,152
Estate Plus Basis Carryover Returns					
2010	4,350	1,138	442	1,010	6,940

Source: Computed from SOI samples of estate tax returns. * Some estate tax returns were filed in each year, and some basis carryover returns were filed in 2010, for estates that were valued at less than $5 million.

Table 2: Estate Tax Attributes in 2009, 2010, and 2011

	2009	2010	2011	Difference Between 2010 and Combined 2009 and 2011
Adjusted Taxable Estate	7.29 (0.21)	3.86 (0.05)	8.14 (0.27)	-3.90 (0.15)
Total Transfer Tax	1.67 (0.08)	0.05 (0.01)	1.17 (0.08)	-1.35 (0.48)
Lifetime Gifts	0.75 (0.06)	0.22 (0.02)	1.02 (0.08)	-0.68 (0.05)
Closely Held Stock	1.72 (0.34)	1.11 (0.24)	1.05 (0.10)	-0.25 (0.26)
Charitable Bequests/Net Worth	0.065 (0.00)	0.093 (0.01)	0.065 (0.00)	0.029 (0.006)
Non-Gain Assets/Gross Estate	0.29 (0.00)	0.27 (0.01)	0.29 (0.00)	-0.028 (0.006)
Leverage/Gross Estate	0.05 (0.00)	0.05 (0.00)	0.04 (0.00)	0.011 (0.004)
Probability of Being Married	0.52 (0.01)	0.68 (0.01)	0.48 (0.01)	0.18 (0.01)
Probability Reside in State with Estate Tax	0.30 (0.01)	0.37 (0.01)	0.28 (0.00)	0.08 (0.01)
Probability Reside in Community Property State	0.18 (0.00)	0.21 (0.01)	0.17 (0.00)	0.04 (0.01)

Values in parentheses are standard errors.

Table 3: Estate Tax Attributes in 2009, 2010, and 2011 for Estates of Greater than $20M

	2009	2010	2011	Difference Between 2010 and Combined 2009 and 2011
Adjusted Taxable Estate	22.01 (1.26)	4.74 (0.58)	25.25 (1.51)	-19.00 (1.16)
Total Transfer Tax	7.39 (0.51)	0.41 (0.17)	6.08 (0.42)	-6.28 (0.37)
Closely Held Stock	9.48 (2.27)	11.78 (3.99)	5.13 (0.57)	4.63 (4.14)
Lifetime Gifts	2.96 (0.39)	0.74 (0.22)	4.48 (0.49)	-3.03 (0.38)
Charitable Bequests/Wealth	0.112 (0.01)	0.274 (0.03)	0.101 (0.01)	0.17 (0.03)
Non-Gain Assets/Gross Estate	0.26 (0.01)	0.19 (0.02)	0.24 (0.01)	-0.05 (0.02)
Debts/Gross Estate	0.05 (0.00)	0.10 (0.02)	0.05 (0.00)	0.05 (0.02)
Probability Decedent Was Married	0.52 (0.02)	0.75 (0.04)	0.52 (0.01)	0.22 (0.04)
Probability Decedent Lived in State with Estate Tax	0.30 (0.01)	0.33 (0.04)	0.29 (0.01)	0.03 (0.04)
Probability Decedent Lived in Community Property State	0.18 (0.01)	0.28 (0.04)	0.20 (0.01)	0.10 (0.04)

Values in parentheses are standard errors.

Table 4: Linear Probability Models Explaining Whether Executor Files an Estate Tax Return

Explanatory Variables	Model 1	Model 2	Model 3	Model 4
Constant	1.282 (0.187)	1.663 (0.172)	1.402 (0.169)	1.377 (0.170)
Age of Decedent	-0.0189 (0.0051)	-0.0158 (0.0045)	-0.0101 (0.0044)	-0.0100 (0.0044)
Age*Age (x 10 -5)	9.90 (3.29)	7.29 (2.88)	4.35 (2.82)	4.31 (2.84)
Male Decedent	0.0381 (0.0121)	0.0519 (0.0107)	0.0433 (0.0106)	0.0385 (0.0106)
Married Decedent	-0.0320 (0.0329)	0.178 (0.021)	0.191 (0.020)	0.216 (0.019)
Estimated Difference Between Estate and Carryover Basis Tax Liability (TAXDIFF)	-1.512 (0.228)	-0.477 (0.107)	-0.331 (0.097)	-0.192 (0.081)
Decedent Married & Resident of Community Property State			0.021 (0.017)	0.021 (0.017)
Decedent Lived in State with Estate Tax			0.138 (0.012)	0.135 (0.012)
Estate with Lifetime Gift			-0.125 (0.011)	-0.127 (0.010)
Estate Value (Range, $M)				
5-10		-0.557 (0.020)	-0.571 (0.019)	-0.550 (0.019)
10-15		-0.776 (0.023)	-0.780 (0.022)	-0.789 (0.022)
15-50		-0.864 (0.024)	-0.857 (0.023)	-0.864 (0.022)
50-100		-0.862 (0.034)	-0.833 (0.032)	-0.845 (0.031)
> 100		-0.895 (0.038)	-0.882 (0.037)	-0.887 (0.034)
Adjusted R-squared	0.119	0.294	0.325	0.333

Source: Authors' estimates using data from Forms 8939 and 706 as described in the text. Robust standard errors are shown in parentheses. In columns (1)-(3), the cash component of estate value for Form 8939 filers is imputed using information from 2009 and 2011 estate tax returns. In column (4), the cash imputation for 8939 filers is based on capitalizing the interest income on the decedents 2009 Form 1040 filing.

Appendix Table A1: Sample Means for Estate Tax Returns (Forms 706), by Year Decedent Died

	2009 (N=7949)	2010 (N = 2788)	2011 (N = 9285)
Summary Estate Values ($000s)			
Adjusted taxable estate	7,294	3,857	8,144
Adjusted taxable gifts	754	217	1,021
Gross estate	14,486	9,859	14,803
Gross estate plus gifts	15,241	10,076	15,824
Net worth	13,745	9,144	14,429
Net worth plus lifetime gifts	14,499	9,361	15,250
Total transfer tax	1,668	51	1,170
Estate Components ($000)			
Annuities, retirement assets	630	709	738
Art	305	109	331
Attorneys' fees	60	23	51
Bond funds	41	37	64
Cash	1,635	736	1,398
Cash Plus Other Non-gain Assets	3,756	2,294	3,548
Charitable bequest	1,735	1,615	1,585
Closely held stock	1,718	1,106	1,052
Community property	2,932	2,534	2,593
Corporate & foreign bonds	180	126	267
Corporate Stock (not closely held)	2,734	1,813	3,976
Debt	742	715	574
Depletables and intangibles	73	145	75
Executors' commissions	70	18	48
Family limited partnership	3	7	5
Farm assets	378	392	410
Federal savings bonds	7	6	8

Federal bonds (other)	352	102	229
Funeral expenses	14	15	14
Hedge funds/private equity	166	148	301
Insurance, face value	217	243	201
Insurance, policy loans	6	3	7
Limited partnerships	599	326	545
Mortgages and notes	618	278	563
Mutual funds (not real estate)	82	60	89
Other non-corporate businesses	318	181	404
Personal residence	700	658	674
Real estate, improved	1,047	970	869
Real estate, vacant land	189	153	147
Real estate partnerships	504	427	539
Real estate, mutual funds	93	183	51
Spousal bequests	5,025	3,740	5,131
State and local bonds	1,681	821	1,618
State death tax deduction	224	81	219
Other assets	223	126	250
Other expenses and losses	81	28	61
Characteristics of Decedents			
Age	79.93	78.37	80.95
Community Property Present?	0.128	0.168	0.117
Deduction for State Death Tax?	0.348	0.273	0.317
Male	0.622	0.685	0.591
Married	0.518	0.676	0.482
Resident of Community Property State	0.177	0.213	0.166
Resident of State with Death Taxes	0.299	0.368	0.282
Ratios Summarizing Estate Composition (Sample Average of Ratios for All Returns)			
Cash/Gross Estate	0.294	0.265	0.292

(Charitable Bequest)/(Net Worth)	0.065	0.093	0.065
(Closely Held Stock)/Gross Estate	0.067	0.071	0.055
Debt/Gross Estate	0.048	0.054	0.039
(Farm Assets)/Gross Estate	0.036	0.049	0.042