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TAX POLICY QUESTIONS REGARDING THE FEDERAL ESTATE TAX AND CHARITABLE BEQUESTS: A TWO STATE ANALYSIS OF PROBATE RECORDS

by

Steven Hanke, C.P.A., M.P.A.

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Business Administration

COLLEGE OF BUSINESS
LOUISIANA TECH UNIVERSITY

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We hereby recommend that the dissertation prepared under our supervision by Steven Hanke entitled "Tax Policy Questions Regarding The Federal Estate Tax and Charitable Bequests: A Two State Analysis of Probate Records."

be accepted in partial fulfillment of the requirements for the Degree of Doctor of Business Administration - Accounting

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ABSTRACT

There is considerable support for extending the temporary repeal of the federal estate tax in 2010 into a permanent repeal. Although repealing the federal estate tax would simplify the current tax system, it may also impair the federal government's ability to prudently aid eleemosynary organizations if charitable bequests' preferential tax treatment is a budget efficient policy. Furthermore, overall charitable bequests may also decline in the absence of a federal estate tax.

Using Virginia and Louisiana probate records from the years 2000-2005, tax policy questions are examined regarding the federal estate tax and charitable bequests. Tobit regression models, adjusted for heteroscedasticity where appropriate, suggest that a federal estate tax with deductible charitable bequests is a budget efficient policy. That is, the deductibility of charitable bequests, for federal estate tax purposes, induces a greater percentage increase in charitable bequests than the corresponding forgone percentage of tax revenue. At the same time, there is evidence that repealing the federal estate tax would generate a larger percentage increase in charitable bequests than the percentage increase in decedents' wealth through federal estate tax savings. Overall, charitable bequests are predicted to decrease if the federal estate tax is repealed. Additionally, the generality of probate research is enhanced by examining multiple states that are diverse in their geographical locations and marital property laws.

The results of the present study are robust under different tax structure assumptions (i.e., date of death, date of will, and expected date of death). Moreover, the results are generally consistent for filers and non-filers of federal estate tax returns as well as the entire sample.

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Author Steven Hanks

Date 6/20/08

DEDICATION

In loving memory of my grandfather, Harold Hanke

May his uncompromising candor
and spirit guide me always.

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CHAPTER 1

INTRODUCTION

Background

Charitable bequests represent an important source of funding for eleemosynary organizations. [1] Specifically, postmortem charitable receipts exceeded $17.44 billion in 2005 (AAFRC 2006). Beyond satisfying a sense of social responsibility, the attractiveness of charitable bequests is enhanced by their exemption from estate taxes. However, charitable bequests will temporarily lose their estate tax deductibility when estate taxes are suspended in 2010. Furthermore, charitable bequests will permanently forgo this tax advantage if estate taxes are repealed. Before eliminating the charitable bequest tax incentive, two important tax policy questions need to be addressed. First, does the preferential tax treatment of charitable bequests stimulate more giving than is lost in tax revenue? Second, what will the net impact be on charitable bequests if estate taxes are permanently repealed?

Estate Tax System in the U.S.

Federal estate taxes are assessed on property transferred by decedents. Computing the federal estate tax liability is a multi-step process. First, the gross

[1] Within the context of this study, charitable bequests are defined as being the eleemosynary legacies specified in a decedent's will.

estate consists of the value of the decedent's interest in all property at least partially owned by the decedent. For married decedents in community property states, the gross estate includes one half of the couple's interest in the community property. The taxable estate is derived by subtracting several deductions from the gross estate. Deductions are allowed for debts, funeral expenses, administrative expenses, spousal bequests, casualty and theft losses, and charitable bequests. Next, the tentative estate tax is computed by using the Unified Transfer Tax Rate Schedule, as presented Table 1.1. However, the tentative estate tax is reduced by the unified credit that equals the estate tax on the portion of the estate up to the exemption equivalent. For example, in 2000 when the exemption equivalent was $675,000, the maximum unified credit equaled $135,550, i.e., $70,800 plus $64,750 (($675,000 – 500,000) x 37%).

Table 1.1 Pre-2002 Unified Transfer Rate Schedule

If the amount is:			
Over (1)	But not over (2)	Tax on (1)	Rate on Excess (1)
$0	$10,000	$0	18
10,000	20,000	1,800	20
20,000	40,000	3,800	22
40,000	60,000	8,200	24
60,000	80,000	13,000	26
80,000	100,000	18,200	28
100,000	150,000	23,800	30
150,000	250,000	38,800	32
250,000	500,000	70,800	34
500,000	750,000	155,800	37
750,000	1,000,000	248,300	39
1,000,000	1,250,000	345,800	41
1,250,000	1,500,000	448,300	43
1,500,000	2,000,000	555,800	45
2,000,000	2,500,000	780,800	49
2,500,000	3,000,000	1,025,800	53
3,000,000		1,290,800	55

The two highest tax brackets of 53 percent and 55 percent apply to estates of decedents dying, and gifts made, on or before December 31, 2001. For estates of decedents dying, and gifts made, after December 31, 2001, for amounts over $2,500,000 the tax is $1,025,800 plus 50% of the amount in excess of $2,500,000. Beginning in 2003, the top marginal rate is 49 percent, applying to all estates of decedents of more than $2,000,000. This amount is reduced incrementally every year until 2007 (48 percent in 2004, 47 percent in 2005, 46 percent in 2006, 45 percent in 2007). In 2007, 2008, and 2009, the top marginal rate holds at 45 percent, applying to estates of more than $1,500,000.
Source: CCH (2007).

State Death Tax Credit

The estates of all decedents who departed from life prior to 2005 are also eligible for the state death tax credit. As discussed in Smith et al. (2006), besides being limited to the amount actually paid, there are three additional restrictions placed on the state death tax credit. First, the state death tax credit tables are applied to the *adjusted taxable estate*,

i.e., the taxable estate minus $60,000. Second, the state death tax credit cannot exceed the gross estate tax reduced by the applicable credit amount.

Third, pursuant to the **2001 Economic Growth and Tax Relief Reconciliation Act** hereafter **EGTRRA** (P.L. 107-16), the allowable state death credit is reduced by 25 percent in 2002, 50 percent in 2003, 75 percent in 2004, 100 percent from 2005 through 2010, and is completely restored in 2011. Moreover, the credit for state death taxes paid is replaced by a deduction when computing the taxable estate in 2005 through 2010.

State governments administer a wide variety of death tax policies. Prior to the **EGTRRA**, the majority of states relied on a *pick-up* system to assess state level estate taxes equal to the credit allowed on the federal estate tax return. After the inception of the **EGTRRA**, state governments generally proceeded with one of the three following courses of action. First, Louisiana and others maintained the pick-up system, which means they do not assess estate taxes from January 1, 2005 through December 31, 2010.

Second, the majority of pick-up states *decoupled* their estate tax law because the **EGTRRA** gradually eliminates the state death tax credit. These decoupled states no longer are attached to changes that occur in the federal estate tax law. Rather, they enacted either their own state law or linked the state law to federal law prior to **EGTRRA**. Third, other states have enacted legislation to repeal their estate taxes. Certain states used a combination of these options, e.g., Virginia. Between January 1, 2005 and June 30, 2007 Virginia assessed estate taxes based on pre-**EGTRRA** law. That is, state estate taxes equaled the state death tax credit allowable prior the **EGTRRA**. Then, Virginia repealed state assessed estate taxes for all persons who die on or after July 1, 2007.

Effects of Charitable Bequests:
An Example

The subsequent scenario demonstrates how deductible charitable bequests impact a decedent's federal estate tax liability: Jeffrey Wiedlandt, a resident of Virginia, died with a gross estate of $5 million. He is unmarried and liable for $40,000 in debts. After his death, funeral and administrative expenses are incurred in the amounts of $10,000 and $7,000, respectively. In his final will, Jeffrey bequeathed $600,000 to the local Southern Baptist Church. Figure 1.1 illustrates the effects of the charitable bequests deduction if Jeffrey departed from life on January 1, 2007. At that time, the Virginia estate tax is based upon the credit for state death taxes allowed under Section 2011, in effect on January 1, 1978. Figure 1.2 presents the impact of deductible charitable bequests assuming Jeffrey died on August 1, 2007, which is after the Virginia estate tax is repealed.

Estate Tax Return Item		Estate Tax Liability if Charitable Bequests: Are Deductible	Are Not Deductible
Total gross estate		$5,000,000	$5,000,000
Debts of the decedent		(40,000)	(40,000)
Funeral expenses		(10,000)	(10,000)
Estate administration expenses		(7,000)	(7,000)
Charitable bequests deduction		(600,000)	0
Tentative taxable estate		4,343,000	4,943,000
State death tax deduction[1]		(287,708)	(385,216)
Taxable estate[2]		4,055,292	4,557,784
Tentative tax:[3]	$10,000 @ 18.0%	1,800	1,800
	10,000 @ 20.0%	2,000	2,000
	20,000 @ 22.0%	4,400	4,400
	20,000 @ 24.0%	4,800	4,800
	20,000 @ 26.0%	5,200	5,200
	20,000 @ 28.0%	5,600	5,600
	50,000 @ 30.0%	15,000	15,000
	100,000 @ 32.0%	32,000	32,000
	250,000 @ 34.0%	85,000	85,000
	250,000 @ 37.0%	92,500	92,500
	250,000 @ 39.0%	97,500	97,500
	250,000 @ 41.0%	102,500	102,500
	250,000 @ 43.0%	107,500	107,500
	3,057,784 @ 45.0%		1,376,003
	2,555,292 @ 45.0%	1,149,881	
		1,705,681	1,931,803
Allowable unified credit		(780,800)	(780,800)
Net estate tax[4]		$924,881	$1,151,003
Gross amount of charitable bequest		600,000	600,000
Less: Charitable bequest tax savings		226,121*	0
Net cost of charitable bequest		$373,879	$600,000

*$1,151,003 - $924,881 = $226,121

1. State death tax deduction is computed pursuant to 2007 Virginia law for persons who die before July 1, 2007.
2. Adjusted taxable gifts made by the decedent after December 31, 1976 are assumed to be zero.
3. 2007 tax rates are used. Also, the total gift taxes paid or payable with respect to gifts made by the decedent after December 31, 1976, are assumed to be zero.
4. Credits for foreign death taxes and prior transfers are assumed to be zero. Generation-skipping transfer (GST) taxes are also assumed to be zero.

Figure 1.1 Impact of Deductible Charitable Bequests on the Federal Estate Tax Liability for a Resident of Virginia Departing from Life Between 1/1/2007 and 6/30/2007

Estate Tax Return Item		Estate Tax Liability if Charitable Bequests: Are Deductible	Are Not Deductible
Total gross estate		$5,000,000	$5,000,000
Debts of the decedent		(40,000)	(40,000)
Funeral expenses		(10,000)	(10,000)
Estate administration expenses		(7,000)	(7,000)
Charitable bequests deduction		(600,000)	0
Tentative taxable estate		4,343,000	4,943,000
State death tax deduction[1]		0	0
Taxable estate[2]		4,343,000	4,943,000
Tentative tax:[3]	$10,000 @ 18.0%	1,800	1,800
	10,000 @ 20.0%	2,000	2,000
	20,000 @ 22.0%	4,400	4,400
	20,000 @ 24.0%	4,800	4,800
	20,000 @ 26.0%	5,200	5,200
	20,000 @ 28.0%	5,600	5,600
	50,000 @ 30.0%	15,000	15,000
	100,000 @ 32.0%	32,000	32,000
	250,000 @ 34.0%	85,000	85,000
	250,000 @ 37.0%	92,500	92,500
	250,000 @ 39.0%	97,500	97,500
	250,000 @ 41.0%	102,500	102,500
	250,000 @ 43.0%	107,500	107,500
	3,057,784 @ 45.0%		1,549,350
	2,555,292 @ 45.0%	1,279,350	
		1,835,150	2,105,150
Allowable unified credit		(780,800)	(780,800)
Net estate tax[4]		$1,054,350	$1,324,350
Gross amount of charitable bequest		600,000	600,000
Less: Charitable bequest tax savings		270,000*	0
Net cost of charitable bequest		$ 330,000	$ 600,000

*$1,324,350 - $1,054,350 = $270,000

1. State death tax deduction is computed pursuant to 2007 Virginia law for persons who die on or after July 1, 2007.
2. Adjusted taxable gifts made by the decedent after December 31, 1976 are assumed to be zero.
3. 2007 tax rates are used. Also, the total gift taxes paid or payable with respect to gifts made by the decedent after December 31, 1976, are assumed to be zero.
4. Credits for foreign death taxes and prior transfers are assumed to be zero. Generation-skipping transfer (GST) taxes are also assumed to be zero.

Figure 1.2 Impact of Deductible Charitable Bequests on the Federal Estate Tax Liability for a Resident of Virginia Departing from Life Between 7/1/2007 and 12/31/2007

Changes in the Federal Estate Tax

Table 1.2 denotes that there are substantial recent changes to both the exemption equivalent and the maximum estate tax rate. For example, the highest tax rate decreased by nine percent, and the exemption equivalent also increased by $1,325,000. Combined, these changes caused a dramatic reduction in the decedents' estate tax liabilities. To demonstrate, a decedent in 2000 with a $2,000,000 taxable estate would have a federal estate tax liability of $420,250 ($555,800 tentative estate tax - $135,550 unified tax credit). Conversely, the federal estate tax liability would be zero for a decedent in 2006 with a $2,000,000 taxable estate.

Table 1.2 Changes in the Exemption Amounts and the Highest Tax Rates During the Sample Period

Year	Exemption Equivalent	Highest Tax Rate
2000	675,000	55%
2001	675,000	55%
2002	1,000,000	50%
2003	1,000,000	49%
2004	1,500,000	48%
2005	1,500,000	47%

Charitable Bequest Tax Policy Analysis

Charitable giving is negatively related to the cost of giving (Smith 1980). Therefore, the federal government has a long history of encouraging charitable donations by offering tax benefits to contributors (Joulfaian 2000a). Currently, there is a two-fold incentive system in place. First, lifetime charitable contribution deductions are offered to individual taxpayers and corporations. Nevertheless, there are several limitations on

what property can be donated, which charitable organizations qualify, and the maximum deductible amount.[2] Second, the estate of an individual who dies testate (i.e., with a will) is allowed deductions for all charitable bequest stipulated in the will.[3]

Charitable bequests provide two advantages over charitable income tax incentives for individuals and corporations. First, the deduction available to estates is not limited. Rather, charitable bequests offer a dollar for dollar reduction in the decedent's taxable estate. Second, there are fewer restrictions regarding which organizations qualify as charitable entities. These advantageous tax incentives are necessary because heirs of the testator normally receive priority over charitable organizations in the allocation of assets.

During the 1970's, there was considerable discussion of increasing tax revenue by abolishing the charitable bequest deduction (Boskin 1976). As such, empirical research examined if the charitable bequest deduction is a budget efficient tax policy. In other words, does the charitable bequest exemption stimulate more funds to be transferred to not-for-profit organizations than is lost in tax revenue? If it is, the charitable exemption is a tax policy mechanism that effectively subsidizes charitable entities (Bennett 1990).

The budget efficiency of deductible charitable bequests exists if there is a negatively elastic relationship between charitable bequests and the relative charitable bequest tax price (hereinafter tax price) which is equal to1.00 minus the marginal tax rate. A negative tax price elasticity with an absolute value in excess of 1.00 indicates a budget efficient tax policy because it reports that a 1% increase in tax price will correspond with a larger than 1% decrease in charitable bequests. In practical terms, this means that the

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[2] Code Section 170.
[3] Code Section 2055.

additional revenue generated by increasing the tax price will be more than offset by the decrease in charitable bequests.

The current debate concerns the repeal of estate taxes. The **EGTRRA** reduces the federal estate tax between 2002 and 2009, repeals it completely in 2010, and brings back the 2001 estate tax rules in 2011. Slemrod (2006) notes 82 percent of respondents in a recent survey support the permanent repeal of the federal estate tax.[4] Thus, the efficiency of charitable bequests is still an important consideration. In essence, if preferential treatment of charitable bequests is tax efficient, then repealing estate taxes would impair the federal government's ability to prudently aid eleemosynary organizations.

Tax Price Identification

Barthold and Plotnick (1984) discuss two interrelated theoretical reasons why the deductibility of charitable bequests for estate tax purposes increases the overall amount of charitable bequests. First, the *substitution effect* assumes that charitable bequests are stimulated since they have a lower tax price than other bequest options.[5] For example, if a decedent faces a 40% marginal tax rate then it only costs 60 cents to give one dollar to charity because of 40 cents is saved in taxes by not giving the dollar to other non-spousal heirs.

The second theoretical reason, *wealth effect*, is created by the positive relation between the extent of a decedent's charitable bequests and the amount of his/her financial resources. The deductibility of charitable bequests amplifies this wealth effect by increasing decedent's wealth because of the corresponding reduction in his/her estate tax liability. Wealth effect is measured in empirical studies by examining the elasticity of

[4] Slemrod (2006) attributes these results to misconceptions regarding the estate tax. Nevertheless, there is abundant support for permanently repealing the estate tax.

decedents' wealth. Repealing estate taxes eliminates the substitution effect but at the same time increases decedents wealth. Therefore, predicting the overall change in charitable bequests in the absence of an estate tax requires a net gain assessment of the changes in the substitution and wealth effects.

The correlation between the substitution and wealth effects necessitates precise identification of the tax price. Unfortunately, the uniqueness of death limits charitable bequest research to cross sectional data (Poterba 1998). Utilizing cross sectional data to accurately identify the tax price is difficult because decedents with similar amounts of wealth face comparable estate tax liabilities. As such, attributing charitable bequests to either a decedent's level of wealth or tax prices is challenging. For this reason, the present inquiry contains both cross-year and within-year variation in the tax price to assist in the tax price identification process.

Examination of Probate Records

There are two sources of information available to gauge the impact of estate taxes on charitable bequests: federal estate tax returns and probate court records.[6] Probate court records are utilized in this study because of the following reasons. First, federal estate tax returns are confidential whereas probate court records are public documents. Naturally, the accessibility of probate documents is an asset to this study. Second, probate records contain a more diverse set of estates because probate filing requirements are lower than the federal estate tax returns. For example, 66 percent of the probate records in Brunetti's (2005) study have gross estates below the federal estate tax filing threshold. Probate records beneath the federal estate tax filing requirements are

[5] A spousal bequest is an important exception to the substitution effect because it is also fully deductible.

important because certain states impose estate and/or inheritance taxes even if no federal estate tax is due. Also, valuable information regarding trends in charitable bequests can be delineated from those estates that do not file federal estate tax returns. Third, only probate records contain the most recent date when the will was revised (i.e., the date of will), which indicates if the charitable bequest decision is based on either the current or the past tax rates. Without this insight, error is likely introduced into the tax price when assessing a sample period containing several changes in tax rates (Clotfelter 1985). Fourth, information regarding the number of surviving children is only available in probate records.

Description of the Inheritance Tax

Bakija and Gale (2003) suggest that while time-series analysis enhances the tax-price identification process, it creates difficulties in delineating the changes in tax rates from other temporal effects. Within-year tax price variation, on the other hand, is more robust in addressing this limitation. For this reason, Louisiana decedents are examined because they are subject to state administered estate and inheritance taxes. Inheritance taxes are assessed by a few state governments as a complement of or as a substitute to state level estate taxes. As displayed in Table 1.3, Louisiana inheritance taxes are different from estate taxes because the heirs or legatees pay tax on the assets they receive. The inheritance tax computation for each heir or legatees is determined by his/her relationship to the deceased. As a result, inheritance taxes provide variation in the amount of total death taxes assessed on a decedent's final estate.[7]

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[6] Survey analysis exists but is not discussed herein because this research focus is on legal documents.

[7] Louisiana decedents' state death tax equals the greater of the inheritance tax or the Louisiana estate tax. Thus, the inheritance tax only induces tax price variation when it is greater than the Louisiana estate tax.

Table 1.3 Taxable Values for Rates for the Louisiana Inheritance Tax

Relationship to the Deceased	Exemption	Categories of Taxable Values	Inheritance Tax Rate
Spouse	Totally Exempt	Totally Exempt	0.00%
Direct decedents by blood or affinity or ascendants	$25,000 each	First $20,000 taxable value	2.00%
		Taxable value in excess of $20,000	3.00%
Collateral relation of the decedent (including brothers and sisters by affinity and their decedents)	$1,000 each	First $20,000 taxable value	5.00%
		Taxable value in excess of $20,000	7.00%
Stranger or nonrelated person	$500 each	First $5,000 taxable value	5.00%
		Taxable value in excess of $5,000	10.00%
Charitable, religious, or educational organizations	Totally exempt	Totally Exempt	0.00%

The other state examined in this study, Virginia, did not administer an inheritance tax during the sample period, which causes the Virginia decedents to have different tax prices than the Louisiana decedents between January 1, 2000 and June 30, 2004. However, Table 1.4 illustrates that this variation between Louisiana and Virginia decreases during the sample period because the Louisiana inheritance tax is phased out between July 1, 1998 and June 30, 2004. Nevertheless, the existence of a Louisiana inheritance tax within 64 percent of the sample period increases tax price variation.

Table 1.4 Phasing Out of the Louisiana Inheritance Tax

Time Period	Reduction in the Inheritance Tax Rates
July 1, 1998 - June 30, 2001	18.00%
July 1, 2001 - June 30, 2002	40.00%
July 1, 2002 - June 30, 2003	60.00%
July 1, 2003 - June 30, 2004	80.00%
After June 30, 2004	100.00%

Econometric Modeling Considerations

The majority of decedents leave zero charitable bequests. Boskin (1976) states that Ordinary Least Squares (OLS) does not account for this abundance of zero's or that charitable observations must be non-negative (i.e., they are censored). Moreover, systematically removing these observations from the dataset "throws away" information (Kennedy 2005, 283) and continues to produce biased and inconsistent estimators (Gujarati 2003, 616).

Given that charitable bequest data is censored, researchers in this arena rely upon the Tobit model. Proposed in Tobin (1958), the Tobit model is a censored regression model where the dependent variable observations are censored if they are below a lower limit value. For the purposes of this study, the lower limit value is zero because it is not possible to leave negative charitable bequests.

Notwithstanding its widespread application, the maximum likelihood estimation of the Tobit model produces inconsistent estimates if there is heteroscedasticity (Arabmazar and Schmidt 1981) or non-normality (Arabmazar and Schmidt 1982) in the

distribution of the error terms. For this reason, the current study examines the error distributions for homogeneity and normality. Several potential remedies are explored when the error distribution deviates from either of these assumptions.

Significance of the Problem

The primary objective of charitable bequest research in the tax policy arena is to ascertain if the tax-free status of charitable bequests is a budget efficient tax policy. That is, does the preferential tax treatment motivate more charitable bequests than is lost in subsequent tax revenue?

The efficiency question is important because if tax-free charitable bequests are budget efficient, then repealing the estate tax will remove an important charitable subsidizing tool of the government. The result of repealing the estate tax is an increase in the tax price of charitable, as well as spousal, bequests to 1.00, which equals the tax price of all other heirs. As a result, it is valuable to understand the relationship between increasing the tax price and the extent of charitable bequests. Empirical evidence regarding this relationship is attained by assessing the elasticity of the tax price. The existence of an estate tax with fully deductible charitable bequests is efficient if the tax price elasticity is negative with an absolute value larger than one. Specifically, this indicates that eleemosynary organizations are expected to have a percentage decrease in charitable bequests that is greater than the percentage increase in tax price if charitable bequests do not provide a tax advantage relative to other heirs.

Unfortunately, probate record studies that estimate the tax price use data sources that are at least twenty years old. More recent data is utilized in federal estate tax return studies; however, they do not have access to important information such as the last will

revision date. Furthermore, the extant literature does not report if the Tobit model error distributions adhere to the error distribution assumptions of homogeneity and normality.

An empirical investigation of recent probate records is needed to assess how repealing the estate tax will influence charitable bequests. On the one hand, repealing the estate tax will have a detrimental effect upon charitable bequests if the tax price is elastic. On the other hand, repealing the estate tax will increase decedents overall wealth because taxes will no longer be transferred to the government. The extent that the wealth effect may potentially dampen or outweigh the tax price effect is an empirical issue to be investigated.

Objectives of the Study

The focus of this research endeavor is to assess whether deductible charitable bequests are a tax efficient policy. The upcoming one-year suspension and potential permanent repeal of federal estate taxes compels empirical evidence to be garnered. Previous studies generally report the deductible charitable bequests as being a budget efficient tax policy. However, the extant literature does not test the homogeneity and normality error distribution assumptions of the Tobit models they employ. Also, prior charitable bequest pattern inferences may not be relevant because the most recent probate data assessed is over twenty years old. In addition, prior probate research limits analysis to a single-state, which restricts the results generality. This study complements and overcomes some of the literatures' limitations by investigating four research questions.

Overview of Research Questions

Research Question 1

The first research question investigates whether the deductibility of charitable bequests create a budget efficient tax policy? Federal estate tax return research (e.g., Boskin (1976), Joulfaian 2000b, and Joulfaian (2005)) generally finds tax-free charitable bequests as being budget efficient. Probate record data studies, by contrast, note inconsistent results. Specifically, Brunetti (2005) and Bennett (1990) report an elastic tax price; however, Barthold and Plotnick (1984) notes that tax price does not affect charitable bequests.

One reason for this conflict in conclusions is that probate studies are able to analyze a broader distribution of wealth than federal estate tax return inquiries. For instance, Brunneti (2005) reports that deductible charitable bequests are not an efficient tax policy in his subsample of probate records with wealth levels below the federal estate tax filing requirements. Nevertheless, extant probate literature lacks generalizability because each study is limited to an individual state. Since prior probate studies assess records that are over twenty years old, they may not represent current charitable bequest patterns.

Recognizing these shortcomings, the present research examines a wide wealth distribution of recent probate records from two states. The tax price is investigated by analyzing Louisiana and Virginia probate records from the years 2000-2005. The tax price elasticity is expected to be negative with an absolute value larger than one.

Research Question 2

The second research question gauges if wealth has an elastic or inelastic influence on charitable bequests? The elasticity of wealth provides evidence regarding the magnitude of the wealth effect for this study's decedents. Based on prior research, the elasticity of wealth is expected to be positive and above the unity (.i.e. +1.00).

Research Question 3

The third research question explored is: What effect does the decedent's location have on charitable bequests? Decedents in Louisiana and Virginia are expected to have different charitable bequest patterns because Louisiana is a community property state while Virginia is not. Previous probate record inquiries do not test for community property state differences because they are single-state studies. Furthermore, Boskin (1976) is the only Tobit regression federal estate tax return study to examine the potential community property effect. In all but one model specification, Boskin reports community property decedents leave significantly less charitable bequests. Other omitted confounding geographical differences between the two states may also exist.

Research Question 4

The fourth research question investigated is: What is the predicted effect of repealing the estate tax on charitable bequests under **EGTRRA**? The predicted change in charitable bequests is the net change of wealth and tax price effects. Prior researchers estimate that the net of these two effects decrease charitable bequests between 4 and 12 percent. Given the developing debate over the permanent repeal of estate taxes, this study estimates its effect on charitable organizations with timely data taken from a

diverse set of decedents. The repeal is expected to dramatically impact charitable bequests; however, there are no *a priori* directional or magnitude of change predictions.

Organization of the Study

This dissertation consists of five chapters. Chapter 1 introduces the relationship between estate taxes and charitable bequests. Moreover, it highlights the importance of this topic and the motivation for the present study.

Chapter 2 reviews the pertinent charitable bequest literature that has a direct influence upon the current research. Chapter 3 presents the research questions, the hypotheses, and the methodology by which they are tested. That is, the sampling procedure is explained, alternative statistical methodologies are contrasted, and variables of interest are discussed along with their coding schemes. Chapter 4 contains empirical findings including descriptive statistics and research question findings. Chapter 5 discusses the empirical results, provides conclusions, and suggests areas of future research. Also, this study's limitations are detailed.

CHAPTER 2

SELECTED LITERATURE REVIEW

Several research inquiries investigate the influence of estate taxes on charitable bequests, and each endeavor provides insights on the issue. Nevertheless, this selected literature review focuses on research that formulates the basis of this study's econometric modeling techniques, tax price identification method, and data selection. The reviewed studies are grouped into two categories: federal estate tax return and probate record research. Federal estate tax return studies are reviewed because they initiated and remain a cornerstone in this research arena. Probate record inquiries are discussed since they are closest in spirit to the present research.

Federal Estate Tax Return Research

The first empirical research in the relationship between estate taxes and charitable bequests is performed with federal estate tax returns. This data source provides large and geographically diverse samples which increases the generalizability of results.

McNees

McNees (1973) investigates the economic consequences of allowing charitable bequests to be deductible under estate taxes. His sample consists of the *U.S. Office of Internal Revenue's Special Study of 1957 and 1959 Estate Taxation.* Instead of utilizing the entire data set, McNees only incorporates the charitable bequest observations into his

OLS model. The dependent variable is defined as the value of the charitable bequests. The independent variables of primary interest are the decedent's gross marginal tax rate and size estate. McNees accounts for other influences on charitable bequests by including the following control variables: marital status, dependency index, tax sensitivity, bequests in trusts, age, and residency. Results are reported for three separate regressions: all estates, estates of more than $1 million, and estates of less than $1 million.

Both the all estates and the estates of more than $1 million regressions indicate that marginal tax rates have a significantly positive relationship with amount of charitable bequests. Conversely, charitable bequests for estates of less than $1 million are not significantly influenced by the marginal tax rate.

Estate size is defined as the gross estate net of debt, administrative, and funeral expenses but not of taxes. It enters as a linear variable in the model of estates less than $1 million and is significantly positive. Meanwhile, estate size is a quadratic term and is significantly positive in the all estates and estates of more than $1 million models.

A degree of dependency index is utilized to capture the level of responsibility a decedent has over individuals he/she leaves behind. Rather than containing how many heirs receive bequests from a decedent, McNees's data only has the number of dependency categories that are receiving bequests. Dependency categories include spouse, children, parents, grandchildren, siblings, other relatives, non-relatives, and unidentified recipients. McNees includes the sum of the number of categories receiving bequests as his degree of dependency index. The degree of dependency index is significantly negative in all three regression models.

An approximation of a decedent's tax sensitivity enters the model, and is measured by the amount of inter vivos gifts a decedent made. The expectation being that decedents who recognize the tax advantages of life-time gift giving are more likely to utilize the deductibility of charitable bequests. Tax sensitivity is significantly positive for the all estates and estates of more than $1 million regressions but is insignificant for the non-millionaire decedents.

The percentage of non-charitable bequests made in the form of trusts is incorporated into the model. McNees offers two interpretations of trust usage. First, it is similar to inter vivos gifts and acts as a complement to charitable bequests. Second, it is an alternative form of tax avoidance that reduces the demand for charitable bequests. Bequests in trusts are significantly negative in each regression.

Marital status dummy variables are used to categorize decedents as either being a husband, wife, widower, or widow. Single decedents represent the baseline of the marital status categorical variables. The husband term is significantly negative in the non-millionaire regression model; however, it is insignificant in the remaining two models. Wives leave significantly more charitable bequests in the all estates and millionaire models. And yet, non-millionaire wives leave significantly fewer charitable bequests. The widower classification is significantly negative in the non-millionaire model but insignificant in the other regressions. Widows leave significantly fewer charitable bequests in all three models.

Although the decedent's age is added as a control variable, it is not influential. The insignificance of age might be the result of conflicting effects during an individual's life cycle. Younger decedents have greater financial responsibilities (e.g., providing for

dependents). By contrast, older individuals often maintain a higher standard of living. McNees also notes that residency in a community property state is insignificant.

Boskin

Boskin (1976) estimates a Tobit regression model on all of the observations, charitable as well as non-charitable bequests, in the Internal Revenue Service Special Study of 1957 and 1959 Estate Taxation data. Boskin explains that this re-analysis of the McNees data is necessary because McNees's approach of using OLS on strictly the charitable bequest observations is not correct. The inappropriateness of the McNees OLS model specification is evidenced by his negative charitable bequests predictions for some observation types (Boskin).

Besides the McNees data, Boskin examines 1969 Federal Estate tax returns. Additional IRS information for the 1969 data allows Boskin to better specify the tax price via the approximation of state death (i.e., estate and inheritance) taxes. The federal estate tax price of charitable bequests is a determined by the dollar value of a decedent's estate. However, differences between state death taxes introduce differences between similar estate sizes if they are domiciled in separate states.

Boskin primarily relies on three sources of variation to identify the tax price. These sources of variation include large sample size (e.g., 5,000 observations for the 1957-1959 data), nonlinearity of the tax schedule, and wide tax brackets. The dependent variable in Boskin's Tobit regressions is the amount of charitable bequests, measured in thousands of dollars.

Wealth is defined as the adjusted disposable estate which is equal to the gross estate less debts, expenses, and tax liability in the absence of charitable bequests. Boskin

discusses two possible definitions of tax price: last and first dollar. The last dollar tax price is computed with the marginal tax rate in effect if one additional dollar had been bequeathed to charity. Unfortunately, the last dollar tax price is simultaneously related to the size of charitable bequests. Therefore, Boskin's results are based on the first dollar tax price, which is the tax price of the first dollar given to charity.

In Boskin's final 1957-1959 model specification, wealth is inelastic, 0.54. This model formulation increases the tax price flexibility by including three tax price terms: 0.60 <; 0.60 ≤ 0.80; and >0.80. The use of three price terms is supported by a likelihood ratio test that rejects all three price terms being equal. Elasticities for the price categories are as follows: -0.90 (0.60 <); -1.40 (0.60 ≤ 0.80); and -1.8 (>0.80). The following demographic variables significantly decrease charitable bequests: being married, under sixty-five years old, trust usage, and young with dependents. Despite having a negative coefficient, the community property state variable is not significant. It is important to bear in mind; however, that being domiciled in a community property state is significant in Boskin's models that do not include the flexible tax price definition.

When employing the 1969 data, the community property location and young with dependent variables are not included because of a lack of necessary information. Since Boskin finds married decedents leave significantly less charitable bequests, he constructs a married decedent's model. This married only model reveals that married decedents have higher tax price elasticities.

Another 1969 model specification includes a percentage of liquid assets variable. As expected, this variable has a significant positive relationship with charitable bequests. The price elasticities of the three price terms in this model are as follows: -0.70 (0.60 <);

-1.70 (0.60 ≤ 0.80); and -3.18 (>0.80). This model reduces the restrictive nature of the wealth parameter by including four separate wealth terms. The only wealth term with an elasticity exceeding unity is in estates greater than $1 million. The impact of the marital status and age variables remain consistent with previous model specifications.

Joulfaian (2000b)

Joulfaian (2000b) addresses whether the charitable deduction is a budget efficient tax policy by using federal estate tax returns for 11,915 individuals who departed life in 1992. A stratified random sample is used with over representation of the rich and young. All decedents with gross estates exceeding $5 million or under the age of 40 are sampled. Joulfaian utilizes the disposable wealth measurement that is equal to net estate minus estate taxes due in the absence of charitable bequests. Thus, disposable wealth closely defines a decedent's budget constraint because it is the maximum amount that could be given to non-charitable entities.

Decedent's age is coded as one of the following: under 45; 45≤55; 55≤65; 65≤75; 75≤85; and over 85. Marital status is classified as married, widowed, single/never married, or divorced/separated. The percent of the estate comprised of business ownership enters the model as an indicator for bequest preference since a family business may be earmarked for the children. Geographical location of decedents is also controlled for by including the dummy variables North, Midwest, and South with the location of West serving as the baseline.

Tobit regressions are performed on the dependent variable *budget share allocated to charitable bequests* which is equal to charitable bequests (less savings from the charitable bequest deduction) divided by disposable wealth. Employing the first dollar

price, [8] Joulfaian finds a significantly positive wealth coefficient with an elasticity of 1.17. The tax price is significant negative with an elasticity of -2.5. Business share exhibits a negative relationship with charitable bequests. Married individuals leave less charitable bequests, while gender is not significant. Age is positively related to charitable bequests, with the most given by decedents at least 85 years old. Meanwhile, decedents located in the North and Midwest regions of the United States leave significantly more to charity.

Noting that it is perhaps the more theoretically tax price, Joulfaian next uses the last dollar price. To reduce the endogeneity created by the last dollar tax price, the size of the charitable bequests and tax price are estimated simultaneously with the Fully Informative Maximum Likelihood (FIML) Tobit model. Explanatory variables in the last dollar tax price equation include the first dollar tax price as well as all of the independent variables from the Tobit model mentioned earlier except for the last dollar tax price. Under the FIML Tobit model, the tax price coefficient (-0.28) and elasticity (-1.70) estimates are smaller than under the first dollar Tobit model. The other coefficients, by contrast, remain relatively stable. Joulfaian also predicts that the repeal of the estate tax will reduce charitable bequests by twelve percent.

Joulfaian (2005)

Joulfaian (2005) demonstrates that it is problematic to group together widowed decedents who faced different tax price treatments of spousal bequests. Prior to 1982, tax-free bequests to a spouse were limited to 50% of the estate. Decedents departing life after 1981 are allowed an unlimited deduction for bequests to a spouse. Joulfaian notes that the Bakija et al. (2003) approach of excluding all married decedents may not

[8] Tax rates are a combination of the federal and state rates.

sufficiently address this problem. That is, the wealth of the surviving spouse is systematically impacted by which tax regime his/her spouse died in. Accordingly, the giving tendencies of surviving spouses may be directly impacted by whether his/her spouse died prior to 1982. As a result, Joulfaian limits his sample to 14,051 federal estate tax returns of decedents in years which the wealth of widowed decedents is consistently measured, 1976 and 1982.

Joulfaian (2005) employs the same dependent variable as in Joulfaian (2000b), i.e., budget share allocated to charity.[9] The wealth variable is defined as disposable wealth. Because last dollar tax price is determined by the size of charitable bequests (i.e., endogenous), it is instrumented with the first dollar price of charitable bequests. The instrumented tax price is equal to one minus the marginal tax price if all estates had left exactly $1,000 in charitable bequests. Marginal tax rates are derived at the date-of-death tax regime. FIML Tobit is utilized to perform the multivariate analysis with control variables (i.e., age, gender, and marital status) beyond tax price and wealth.

Joulfaian (2005) reports that the log of the wealth and tax price variables are both significant.[10] Significantly positive demographic variables include being single/divorced/ separated rather than widowed and age but at a declining rate. Meanwhile, males and decedents located in the South and West leave significantly less to charity. Also, the potential implications of decedents making bequest decisions upon the expected future estate tax rates is investigated by re-performing the model with the fully phased-in

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[9] Joulfaian (2005) also performs multivariate analysis using an alternative measure of budget share as defined in Randolph (1995). However, I do not focus on this alternative budget share measure because while Joulfaian finds it produces qualitatively similar results, it has lower predictive power of average bequests.

[10] The elasticities for wealth and tax price are not reported by Joulfaian (2005) for the equations with the Joulfaian (2000b) dependent variable.

ERTA81 law that occurred in 1987. Utilizing the expected tax rates causes log of both the wealth and tax price variables to become more significant.

Joulfaian (2005) predicts the change in charitable bequests when the estate tax is repealed for each decedent. As such, he compares the predicted value of each charitable bequest at the date-of-death tax rate versus the value predicted when estate tax rates equal zero. He estimates that charitable bequests will decline by thirteen percents.

Summary of Federal Estate Tax Return Research

Federal estate tax return inquiries use the Tobit model because of its econometric advantages over OLS models. Yet, no study to date tests the robustness of the Tobit model results to violations in the error distributions of homogeneity and/or normality. The current research addresses this void by examining the error distributions and explores the applicability of several potential remedies if either distribution assumption is violated.

Although it is not exogenous, Joulfaian (2000b) suggests that the last dollar tax price is potentially the theoretically correct motivation of charitable bequests. Federal estate tax return researchers report that the instrumented last dollar tax price via the FIML Tobit model produces slightly different results. As such, in addition to using the first dollar tax price, reasons are provided as to why the testing of the last dollar tax price with an FIML Tobit model is not appropriate for the current study.

Residence in a community property state is identified in Boskin (1976) as a deterrent for leaving charitable bequests, however, this variable was last tested thirty years ago. The majority of federal estate tax return research also includes state death taxes to improve the specification of the tax price of charitable bequests. Meanwhile, prior probate record research is restricted to single-state analysis. The present inquiry

bridges the gap between the two sets of research by examining probate records from two states with different state death tax structures. Furthermore, one state is a community property state (i.e., Louisiana) while the other is a common law state (i.e., Virginia), which provides updated evidence on this variable's impact in charitable bequest patterns.

Joulfaian (2005) notes that a widow's wealth is systematically impacted by the tax regime his/her spouse died in. The biggest change in surviving spouse's wealth occurred in 1982 with the introduction of the unlimited marital deduction. Nevertheless, this limitation is most likely mitigated in the current study by the fact that at least eighteen years have passed if a decedent did become widowed before the introduction of the unlimited marital deduction. Thus, compounding effect of the events that occurred since they became widowed probably reduce the direct impact of limited spousal bequests.

Federal estate tax return research states that inferences regarding the significance and elasticity of variables are impacted by which tax regime the decedent is assumed to have made his/her charitable bequest decisions under. Consequently, this study assesses charitable bequest patterns under the date-of-death tax and expected future tax structures (i.e., marginal estate tax rates and exemption equivalent amounts).

Probate Record Research

Probate records are an alternative data source for empirical researchers examining the effects of estate taxes upon charitable bequests. There are three advantages to using probate records rather than federal estate tax returns. First, probate records are easily accessible because they are public documents. Conversely, federal estate tax returns are confidential information. Second, probate records accommodate inferences over a larger wealth distribution of decedents. That is, observations within federal estate tax return

studies are limited to decedents with gross estates equal to or larger than the federal estate tax filing requirement. Meanwhile, the probate record threshold is significantly lower.

Third, probate records contain unique data. For example, the tax price in effect on the *date-of-will* might be more influential for charitable bequests than the date-of-death tax prices. Probate records also report the number of surviving children.

Barthold and Plotnick

Barthold and Plotnick (1984) examine 1,050 wealthy Connecticut probate records from the 1930s and 1940s. The sample consists of 346 estates with charitable bequests. Their inquiry advances estate tax research by estimating the tax price of charitable bequest from data containing considerable cross-year variation. They also incorporate unique variables from the probate records that are not utilized by prior studies. Coincidently, Barthold and Plotnick are the first to report empirical evidence that the estate tax does not significantly impact charitable bequests.

The sample period for Barthold and Plotnick contains several large federal estate tax law changes. The Connecticut inheritance tax rates also changed considerably during this period. As a result, persons with similar levels of wealth face unique tax prices if they depart from life in different years. Substantial cross-year variation provides Barthold and Plotnick with increased separation of the wealth and tax price effects.

Probate data allows Barthold and Plotnick to control for two previously unaccounted for demographic variables within their Tobit regressions: religion and relatives. Four religious affiliation categories are utilized: Protestant, Catholic, Jewish and other or not available. Decedents with a religious preference leave significantly larger charitable bequests. At the same time, the charitable bequests are not significantly

different between the different religious affiliation categories. Charitable bequests are significantly less for decedents with a surviving spouse or children. Meanwhile, gender and the presence of grandchildren and other relatives are insignificant.

Barthold and Plotnick calculate marginal tax rates as a function of the federal and Connecticut laws in effect during the year of death for each decedent.[11] The first dollar is assumed to determine the marginal tax rate; hence the tax price is independent of the charitable bequest amount. Wealth is measured by the size of a decedent's gross estate.

The first Tobit model specification is in logarithmic functional form. That is, charitable bequests, wealth, and tax price enter as logarithmic estimates. Wealth is highly significant but its elasticity is below unity, 0.44. Tax price, on the other hand, does not significantly influence charitable bequests. Linear specifications of the variables result in qualitatively similar findings. Although wealth becomes even more inelastic (i.e., 0.15), wealth and tax price remain significant and insignificant, respectively.

As a result of immense changes occurring in the U.S. economy during the sample period, two dummy variables are added to another model to address the potential impact of different tax regimes. Specifically, the dummy variables are coded to separate the following temporal effects: pre-1932, 1932-1942, and 1943. Demographic characteristics remain similar and the wealth term is still significantly positive. Most importantly, the tax price variable becomes marginally significant with elasticities of -0.75 and -0.81, under the linear and logarithmic models respectively. Nevertheless, Barthold and Plotnick state that they "place little faith" in temporally adjusted model because tax price is insignificant in all other models.

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[11] Barthold and Plotnick do not perform analysis with the date of will tax prices. However, their results are not affected by the tax rates in effect two years prior to and five years after death.

Bennett

Bennett (1990) analyzes 618 probate records from Harris County, Texas in the 1970s and the 1980s. Charitable bequests are indicated in 84 probate records. The Tobit regression procedure is used to calculate the tax price and wealth elasticities for charitable bequests.

A flexible tax price measurement is utilized by allowing tax price to enter the regression as three separate variables: 0.60 <; 0.60 ≤ 0.80; >0.80. The wealth variable is defined by the net estate and in current dollars. Bennett relies on considerable cross-year variation in federal estate tax rates and the unified credit to reduce the collinearity between wealth and tax price variables.

Results of the full sample reveal a significantly positive wealth variable and an elasticity of 0.502. Meanwhile, the price terms are all significantly negative with following elasticities: 0.60< (-3.01); 0.60≤0.80 (-2.65); >0.80 (-2.90). As such, Bennett states that the deductibility of charitable bequest initiates more bequests than is lost in tax revenue. Demographic control variables indicate that being younger than sixty-five, having children, and married, significantly decreases charitable bequests.

The Tobit model is performed on a restricted sample of married decedents to garner additional information on the marital status role in charitable bequests. Although Bennett notes that the married subsample is not influenced by the tax price, the elasticity for each tax price variable exceeds minus one (i.e., -1.08, -1.98, and -2.43, respectively). Tobit regressions are also performed with the wealth and charitable bequest variables deflated by the GNP price, using 1970 as the base year. Results of the deflated regressions are qualitatively similar to the preceding tests.

In the final Tobit regression formulation, adjusted disposable estate (i.e., net estate in the absence of charitable bequests) is used to measure wealth. Bennett suggests that adjusted disposable estate is potentially a more accurate assessment of a decedent's opportunity to make charitable bequests. Additionally, the effect of wealth is measured by three estate size variables: < $100,000; $100,000 ≤ $1,000,000; and > $1,000,000. There is little variation between the wealth term elasticities; however the largest wealth term does have the greatest elasticity. The direction of coefficients and elasticities for the remaining variables are consistent with previously discussed results. Bennett also considers how eliminating the estate tax would impact charitable bequests. She estimates a 59.1% reduction in charitable bequests in the absence of an estate tax.

Brunetti

Brunetti (2005) examines 5,650 San Francisco probate records from 1980-1982. Approximately 13.8 percent of the decedents in the sample made charitable bequests. An objective of Brunetti is to test the validity of extant literature assumptions used to reduce collinearity between the wealth and tax price terms. For instance, variation is often induced into the tax price term by selecting the marginal tax rate after deducting the spousal bequests of married decedents. This method is premised on marital bequests being determined prior to charitable bequests, i.e., exogenous spousal bequests.

Another assumption is that bequests are determined by the date-of-death tax regime, nevertheless, bequests might be influenced by the tax regime effective on the date-of-will. Fortunately, probate records include the date-of-will and the last will revision date, if any. Brunetti creates four tax price variables, each consisting of a unique combination of these two assumptions. For example, date-of-death tax rate assuming

predetermined spousal bequests. In addition to the reported first dollar tax price results, he states that similar findings occur with an instrumented last dollar tax price.

Brunetti's dependent variable is charitable bequest divided by wealth. The measure of wealth is defined as net estate less the tax liability if decedents did not leave charitable bequests. Extent of a decedent's estate tax planning is gauged by a dummy variable coded as "1" if the decedent left a property in a trust and zero if there is no trust utilized. Religious membership is coded as "1" when funeral records mention a religious service and zero if no religious affiliation is indicated. Lack of liquidity is controlled for with a business share explanatory variable. Other demographic variables are marital status, gender, age, and number of children.

Date-of-Death. The first set of Tobit regressions in Brunetti use the date-of-death tax schedule tax price and is performed on the *filers* subsample. These filers consist of all decedents required to file federal estate tax returns because his/her gross estate size is equal to or larger than the federal filing requirement. Several specifications of the model are made within this first set of regressions, including those designed to reduce the impact of the nonlinear tax schedule by including combinations of polynomial wealth terms, indicators for each wealth quintile, and a wealth and price interaction term.

Under the linear wealth term model formulation, tax price is significant (-1.34 elasticity) and wealth is insignificant (1.04 elasticity). A negative relationship exists between charitable bequests and being married, number of children, and business share of the estate. Meanwhile, charitable bequests are positively influenced by belonging to an organized religion. The trust use, age, and gender variables are not significant. Age is thereby not included in the subsequent models. Re-performing the first model after

removing the age variable produces similar results except wealth is significant. Model formulations with nonlinear wealth effects create comparable estimates; however, the price elasticity does decrease slightly.

The second group of Tobit regressions is modeled with the *non-filer* subsample. These decedents have a gross estate value below the federal estate tax filing requirements. Brunetti notes that this analysis provides insight into an often over looked section of wealth distribution because prior studies use only federal estate tax return data or probate records of very wealthy decedents.[12] Tax price and wealth estimates are highly significant and elasticities range from -6.16 to -5.72 and 0.75 to 1.19, respectively.[13] It is important to bear in mind that the elasticities for the tax price variable are considerably greater for the non-filer than filer decedents. Trust usage and belonging to a religious organization are significantly positive. Conversely, being married and the number of children are significantly negative variables. Both the gender and share of business assets variables are insignificant.

Date-of-Will. Brunetti reports that several patterns emerge for the filers subsample when regressions employ the date-of-will instead of the date-of-death structure and incorporating all previously discussed control variables except age. First, adding higher order wealth terms increases (decreases) the wealth (tax price) elasticities. This implies that under (over) estimation may occur for the wealth (tax price) elasticities if nonlinear wealth terms are not included. Second, the form of polynomial wealth specification has little impact on elasticities. Consequently, the nonlinear wealth effect is sufficiently addressed by including a quadratic wealth term.

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[12] Bennett (1990) is the exception to this statement.
[13] Brunetti (2005) estimates the standard errors of the elasticities with the delta method.

Third, wealth elaticities usually exceed unity. Fourth, elasticities for both wealth and tax price under the date-of-will tax rate are comparable to that of date-of-death when the filing status (i.e., above or below filing threshold) is assumed to be the date-of-will status. Alternatively, the date-of-will price elasticities increase substantially (i.e., between -2.54 and -2.38) and wealth elasticities become insignificant when the date-of-death filing status is relied on.

Performing preceding analysis in the non-filers subgroup indicates that the nonlinear wealth terms increase the price elasticity estimates. Date-of-death tax rates produce significant (insignificant) the price elasticity estimates under the date-of-will (date-of-death) filing status assumptions. Also, evidence of the relative importance of the tax regime assumptions is assessed by including both date-of-will and date-of-death tax prices in the same regression. Once again, the date-of-will price elasticity is greater.

Further Models. Although the primary focus of Brunetti is on contrasting the results of filers and non-filers, he does report elasticities for the entire sample. Each tax price and wealth elasticity for the entire sample is statistically significant. Nonetheless, all elasticities for the entire sample are below unity.

Another regression model is formulated with a subsample of decedents who revised their will in the year of death. This sample contains the lowest measurement error in tax price unless they assumed future tax prices. Resulting tax price and wealth elasticities are large and significant for both the filers and non-filers subgroups, except for the wealth elasticity of non-filers.

Instead of determining the distribution of bequests based on date-of-will or date-of-death tax rates, decedents may also compute the bequest via expected tax rates.

Consequently, Brunetti uses the fully phased-in tax schedule of the **Economics Recovery Tax Act of 1981** (i.e., **ERTA-1981**) if the decedent died on or after its passage on August 13, 1981. Once again, charitable bequests are significantly impacted by tax price and wealth. Nevertheless, compared to the date-of-death and date-of-will tax prices, elasticities are much smaller (slightly larger) for tax price (wealth).

Pre-determined Spousal Bequests. Potential bias in prior studies employing predetermined spousal bequests is investigated by including this assumption as a source of variation. The resulting tax price and wealth elasticities are similar to estimates attained without the spousal bequest assumption. Accordingly, there is no evidence that bias exists in prior studies employing the predetermined spousal bequest assumption.

At the same time, a lack of bias does not substantiate spousal bequests as being predetermined. Therefore, the price of spousal bequests[14] is included as an explanatory variable and is significant. Spouse price and charity price are also significant explanatory variables in a regression with the dependent variable being the spousal bequests divided by wealth. Hence, there is evidence that spousal bequests are not predetermined. As such, predetermined spousal bequest models are misspecified.

Brunetti concludes by estimating the impact of **EGTRRA** on charitable bequests. Specifically, how will charitable bequests change when there is no longer an accompanying tax price incentive. He employs a quadratic model with the date-of-death tax price in the predictions for each decedent. The un-weighted average of these predicted values over all decedents is reported, and suggests that filers' charitable bequests will decrease by 4%.

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[14] The unlimited marital deduction was only in effect during the last one-third of Brunetti's sample period. Therefore, his sample contains the variation necessary to compute a spousal bequest tax price.

Summary of Probate Record Research

Probate researchers find that the assumption regarding which tax regime (i.e., date-of-death, date-of-will, or expected future) motivates charitable bequests has important implications. That is, the elasticity of tax prices and overall effect of repealed estate taxes are sensitive to the tax rate structure assumption. This study reports results under all three tax rate assumptions.

Sources of tax price variation are necessary to delineate the tax price from wealth effect in charitable bequests. Consistent with prior probate research, the current study utilizes inheritance tax law changes as an additional source of tax price variation. Further sources of variation are gained through the changes in the federal estate tax equivalent exemption level and top marginal tax rates.

Brunetti finds that differences exist between filers and non-filers. Since the federal exemption equivalent has increased significantly, a larger portion of the wealth distribution is no longer filing federal estate tax returns. Also, the most recent probate data on non-filers is twenty years old. This research inquiry fills these voids with an analysis of recent non-filer decedents.

CHAPTER 3

RESEARCH METHODOLOGY

This study assesses whether deductible charitable bequests are a budget efficient policy for estate tax purposes. Making such an inference requires computing the elasticity of the tax price variable resulting from a bequest demand equation. Traditionally, this elasticity is based on the Tobit model tax price estimate that is formulated to handle an abundance of dependent variables with zero observations. Unfortunately, the Tobit model relies on restrictive error distribution assumptions that may not be appropriate for charitable bequest data. Accordingly, the present study analyzes the error distributions and examines potential remedies if they are violated. The motivation for and execution of methodological considerations employed in this research endeavor are demonstrated in this chapter. That is, research questions, research sample construction, potential variables, and model formulations are discussed. Furthermore, assumption tests for the model formulations are also provided.

Research Questions

As discussed in Chapter 1, the following research questions are assessed to garner a clearer understanding of the estate tax impact on charitable bequests.

1. Is the deductibility of charitable bequests a budget efficient tax policy? That is, does a 1% change in the tax price lead to a larger than 1% change in charitable bequests?

2. Is the wealth elasticity above unity?
3. Does a decedent's domicile significantly affect charitable bequests?
4. What is the predicted effect of repealing the estate tax on charitable bequest under **EGTRRA**?

Research Sample

Probate Data

Federal estate tax returns and probate records both contain information regarding charitable bequest patterns. The present study samples probate records because federal estate tax returns are confidential. Moreover, important information, such as the date-of-the-will, is exclusively available in probate records. Testate probate records include a decedent's testament/will that controls the distribution of his/her assets. Conversely, if a decedent does not leave a will, he/she is classified as dying intestate. Under these circumstances, state law establishes the order that the decedent's assets are distributed. Since this research inquiry is exclusively interested in testate probate records, such files are referenced as probate records hereafter.

In addition to a decedent's will, probate records contain demographic information such as age,[15] domicile,[16] and date of death. Financial information regarding the decedent is also included; however, the form of this information is contingent on a decedent's location and time of death. For example, probate records for Louisiana decedents include a Detailed Descriptive List of Property that reports a decedent's assets,

[15] Age is not always reported in the Virginia probate records. For these cases, the decedent's age is obtained from Ancestry.com which provides obituaries, a social security death index, and public records.
[16] The current study is restricted to decedents domiciled in either Louisiana or Virginia because non-resident probate records are not expected to accurately reflect a decedent's financial status.

debts, and liabilities.[17] Furthermore, probate records for Louisiana decedents dying prior to July 1, 2004, include a Louisiana Inheritance Tax Return. These inheritance tax returns list all immovable property and all tangible movable property physically located in Louisiana and all intangible moveable property wherever it is situated.[18]

Virginia probate records include an inventory that reports the fair market value of a decedent's personal estate under the executor's control, interest in any financial institution multiple party non-survivorship account, and any real estate that is an asset of the decedent's estate.[19] Assets that are discovered after the filing of the inventory are

[17] According to the Louisiana Code of Civil Procedure Article 3031, a succession (i.e., transfer of wealth to a decedent's successors) must be opened for every Louisiana decedent. However, an administration can be avoided if the following conditions are met. First, all legatees are either competent or acting through legal representatives. Second, all legatees accept the succession. Last, none of the creditors of the succession have demanded its administration. See Revels et al. (2007).

[18] Property excluded from inheritance tax returns include any proceeds receivable by any beneficiary, other than the decedent's estate, under a life insurance policy or retirement or pension plan. Nonetheless, the inheritance tax return does include items that are not subject to probate such as a living revocable trust.

[19] Property specifically excluded are joint-held assets such as real estate, brokerage accounts, and stock certificates held jointly by the decedent and another person, persons, with the right of survivorship or held by the decedent and the decedent's spouse as tenants by the entirety, and assets passing by way of a survivorship provision, a payable on death provision, or a transform of death provision. The same is true for money payable under a beneficiary designation contained in a life insurance policy, IRA, pension, or other arrangement unless the estate is the beneficiary.

recorded on an Account for Decedent's Estate (Account).[20] Furthermore, receipts and payments made in the administration of a decedent's estate are recorded in the Account.[21]

As a result of these differences between the federal estate tax laws and state inheritance and probate laws, the taxable estate estimates solely from probate records may not equate the taxable estate for federal estate tax purposes. Accordingly, this study imputes the taxable estate for federal estate tax purposes from estate tax payment amounts recorded in the probate records.

Sample Locations

This research inquiry examines a stratified random sample of 900 probate records in Louisiana and Virginia between the years 2000 and 2005. The Louisiana probate records are collected from Lincoln Parish and Rapides Parish. The probate records from Virginia are attained from Arlington County because it has a comparable population to the combined populations of Lincoln and Rapides Parishes. Arlington County Virginia is also chosen because its probate records are available on-line.

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[20] If the estate remains open for longer than six months, additional Accounts must be filed as long as the estate is being administered. Moreover, Virginia Code Section 26-20.1 allows for a statement in lieu of a detailed account to be filed if each of the residual beneficiaries is also a personal representative. The current study does not analyze probate records that contain a statement in lieu of a detailed account because it is not possible to determine the amount of a decedent's debts and expenses. Thus, the decedent's marginal tax rate cannot be calculated.

[21] Unfortunately, the Account combines income and expenses that need to be separated between the estate tax return and the estate fiduciary income tax return. For instance, the first Account reports dividends received one day after the date of death, which most likely is included in a decedent's gross estate. Meanwhile, the first Account will also report dividends received four months after a decedent's death; these dividends are fiduciary income and are not includible in the decedent's gross estate. As a result, the current study established the following rules to allocate the Accounting receipts and payments between the decedent and the fiduciary. First, all Account income receipts received within five days after the decedent's death are added to the decedent's gross estate. Second, first Account payments (except for estate tax payments) are classified as being deductible on the decedents estate tax return. Payments on subsequent Accountings are considered to be deductible for the fiduciary. The payments are given a longer period to be related to the decedent because the inventory is intended to capture the majority of income owed to the decedent at their death.

Descriptive statistics from the U.S. Census (2000) for the sample locations are reported in Table 3.1. Although the population is larger in Arlington Virginia (hereafter Virginia), the death rates in the Louisiana Parishes (hereafter Louisiana) is higher. Thus, the number of probate records per year is similar. The percent of population 65 years or older is larger (smaller) than the national average in Louisiana (Virginia), respectively. Conversely, the median household income is larger (smaller) than the national average in Virginia (Louisiana), respectively. Virginia has a lower portion of their population below the poverty level than the national average while Louisiana has more.

Table 3.1 Comparison of Sample Locations

Demographic Variable	USA County Average	Arlington County, VA	Rapides Parish, LA	Lincoln Parish, LA
2000 Population	N/A	189,453	126,337	42,509
Death rate per 1,000 residents	8.6%	6.3%	10.0%	7.6%
Percent of population > 65 years old	12.4%	9.3%	13.1%	11.3%
Median household income ($1997)	37,005	57,244	28,038	27,231
Percent of population below poverty level	13.3%	8.1%	15.6%	20.0%

Sample Size

Estimates from the maximum likelihood estimation process contain the asymptotic properties of efficiency, normality, and consistency. Unfortunately, the properties of small samples are less established. Long (1997, 53) asks: *When is the sample large enough to use maximum likelihood estimates and the resulting tests?* As general guidance, Long recommends that there should be at least 10 observations per parameter. In addition, there are other reasons as to why the sample size may need to be increased such as high collinearity among variables. Accordingly, 900 observations are

collected for the present study. The sample is taken evenly between Louisiana and Virginia and over the six year period from 2000-2005. As a result, 75 observations are sampled each year within each state.

Choice Based Sampling

The purpose of this research inquiry is to analyze how charitable bequests are impacted by changes in death taxes. Therefore, a choice-based sampling procedure is employed with charitable bequest probate records sampled at a higher rate (i.e., 100%) than their true proportion of the population (approximately 5%). Choice-based sampling is utilized for two reasons. First, in the absence of extremely large samples, a random sample of data containing an infrequently occurring observation of particular interest (i.e., charitable bequest) provides relatively imprecise parameter estimates (Dopuch et al. 1987). Second, time and resource constraints are not sufficient to allow for the recording of each probate record.

The choice-base sampling procedure is conducted as follows. First, all charitable bequest records are automatically sampled. Next, the number of charitable bequest probate records within each state during each year is subtracted from seventy-five. For example, if there are 15 Louisiana charitable bequest observations for the year 2000, then 60 non-charitable bequest records are sampled in Louisiana for the year 2000.

Third, the charitable bequest records for each location and year are categorized as either filers or non-filers. The classification of filers vs. non-filers is based on whether the gross estate is above the federal equivalent exemption amount. Subsequently, the number of charitable bequest estates that are classified as filers and non-filers are divided by the total number of charitable bequest estates. The resulting proportions for filers and

non-filers are multiplied by the number of non-charitable bequest observations needed to bring the total sample size up to seventy-five. Finally, a random sample is taken of both filer and non-filer estates without charitable bequests to satisfy the number calculated in the previous step.

Research Methods

Multivariate analysis is utilized to ascertain the impact death taxes have on charitable bequests while controlling for important demographic variables. Similar to Joulfaian (2000b, 2005), the following equation is estimated for each decedent *i*:

$$BSACB_i = \beta_0 + \beta_p \ln p_i + \beta_w \ln w_i + \beta_{loc} loc_i + \gamma Z_i + \varepsilon_i \qquad (1)$$

where BSACB is the observed Budget Share Allocated to Charitable Bequests and is measured as follows:

$$BSACB = \frac{[CB - (T_0 - T)]}{(W - T_0)} \qquad (2)$$

where CB is the actual amount of charitable bequests and T is the actual amount of death taxes paid. Charitable bequests tax price is defined as variable *p*. The variable *w* is disposable wealth, W-T_0. That is, net estate (i.e., W) less the tax liability computed by setting charitable bequests equal to zero (i.e., T_0).[22] A decedent's location is defined through the variable *loc* which has Louisiana decedents coded as "1" and Virginia

[22] Formula (1) follows Joulfaian (2000b, 2005) by performing the log transformation on the independent variables of tax price (p) and disposable wealth (w) but not the dependent variable of budget share (w). Brunetti (2005) does not apply the log transformation to his dependent variable (budget share) or any of the independent variables, however, does utilize polynomial terms for disposable wealth. Bennett (1990) does not utilize log transformations; rather, tax price and disposable wealth enter the model within three separate size categories to model nonlinear effects. The dependent variable in Bennett (1990) is the dollar value of charitable bequests. Barthold and Plotnick (1984) employ the log transformation on the independent variables of gross estate and tax price as well as the dependent variable (i.e., charitable bequests + 1). Boskin (1976) does not use log transformations on the adjusted disposable estate, tax price, or his dependent variable of charitable bequests.

decedents taking on the value of zero. Table 3.2 presents a list of all, including demographic control, variables that are utilized in this study.

Table 3.2 Definitions of Variables

Variable	Definition
Business Share Allocated to Charitable Bequests (BSACB)	$= [CB - (T_0 - T)] / (W - T_0)^*$
Charitable Bequests Tax Price (i.e., p)	= 1.00 – Marginal tax rate
Disposable Wealth (i.e., w)	$= W - T_0$
Location (i.e., loc)	= 1 if a Louisiana decedent; = 0 if a Virginia decedent
Business Share	= Overall business ownership / Gross estate
Children	= The number of surviving children
Age	= Age of the decedent
Gender	= 1 if decedent is a male; = 0 if decedent is a female
Trust	= 1 if decedent utilizes a trust; =0 if decedent does not utilize a trust
Marital Status	= 1 if decedent is married; = 0 if decedent is not married

Notes:
*CB is equal to the amount of charitable bequests. T is equal to the decedent's actual tax liability while T_0 is equal to the decedent's tax liability setting charitable bequests equal to zero. W is equal to the decedent's net estate.

The sample consists of 900 probate records from Louisiana and Virginia during the period 2000-2005. A choice-based sampling technique is utilized to ensure that the sample incorporates two features. First, the sample includes the maximum number of charitable bequest probate records possible because they are the observations of the highest interest. Second, the portion of the sample comprised of filers is the same for non-charitable bequest observations as it is for charitable bequest decedents. Analysis is performed on the entire sample as well as the filers and non-filers sub-samples.

Model Specification

Previous charitable bequest research employs the Tobit model; however, no evidence is provided as to whether the underlying error distributions are homogeneous and normal. If the error distribution violates either of these assumptions, the Tobit model estimates are inconsistent. Therefore, the error distribution of this study's data is tested for homogeneity and normality. Several remedies are explored when the error distribution deviates from either of these assumptions.

Abundance of Zero Observations. Empirical researchers in demand analysis often encounter an abundance of zero observations on the dependent variable. For example, this problem is present when investigating the demand for tobacco (Jones 1992), alcohol (Yen and Jensen 1996), meat (Newman et al. 2001), child care (Joesch and Hiedemann 2002), and charitable bequests (Brunetti 2005).

Econometric techniques used by charitable giving and bequest researchers to address the many zeros problem have continuously evolved. McNees (1973) performs OLS exclusively on charitable bequest observations. Unfortunately, the systematic removal of these observations "throws away" information (Kennedy 2005, 283). Furthermore, employing OLS strictly on the subset of non-zero dependent variable observations produces biased and inconsistent estimators (Gujarati 2003).

Boskin and Feldstein (1977) add a small sum to the dependent variables prior to estimating a log-log version of the demand function on the entire sample. This methodology has the shortcoming of implying that all zero observations arise from either misreporting or infrequency of expenditure, which precludes the possibility that they are a corner solution (Jones and Posnett 1991).

Tobit Model. Similar to other arenas of censored data economic research, [23] charitable bequest studies currently employ the Tobit model. Proposed by Tobin (1958), the Tobit model is a censored regression model where the dependent variable, y_i, observations are censored if they are below a lower limit value, L_1. The vector of independent variables is represented by x_i. For the purposes of this study, the lower limit value is zero because it is not possible to leave negative charitable bequests.[24] Since the dependent variable of the current study (i.e., BSACB) is a proportion, it is necessary to use a two-limit Tobit model. In addition to the lower limit of zero, the two-limit Tobit model has an upper limit value, L_2, which is equal to 100% in the current study because this is the maximum portion of a decedent's wealth given to charitable organizations. As such, the Tobit model is specified with a latent variable y*:

$$y_i^* = \beta x_i + u_i \qquad (3)$$

$$u_i \sim IN(0, \sigma^2)$$

The latent variable y_i^* is related to the actual observed y_i by the following relationship:

$$\begin{aligned} y_i &= L_1 \quad \text{if } y_i^* \le 0, \qquad (4) \\ &= y_i^* \quad \text{if } L_1 < y_i^* < L_2, \\ &= L_2 \quad \text{if } y_i^* \ge L_2 \text{ otherwise.} \end{aligned}$$

Consequently, the limited dependent variable takes on the value of zero when the latent variable y_i^* falls below the lower limit. Likewise, a value of one is assigned to the limited dependent variable if it falls above the upper limit. On the other hand, when greater than zero but less than one, the latent variable y_i^* is equal to the observed

[23] See Amemiya (1984) for a comprehensive overview of the various categories of Tobit model research.
[24] The lower limit value is usually zero (Maddala 1991); however, the lower limit can take on any value.

dependent variable value. As noted in Maddala (1991), the following maximum likelihood function can be used to formulate the parameters β and σ:

$L(\beta,\sigma|y_i,x_i,L_{1i}, L_{2i})$ (5)

$$= \prod_{y_i=L_{1i}} \Phi\left(\frac{L_{1i}-\beta' x_i}{\sigma}\right) \prod_{y_i=y_i^*} \frac{1}{\sigma}\phi\left[\frac{y_i-\beta' x_i}{\sigma}\right] \prod_{y_i=L_{2i}} \left[1-\Phi\left(\frac{L_{2i}-\beta' x_i}{\sigma}\right)\right]$$

where $\phi(\cdot)$ is the univariate density function and $\Phi(\cdot)$ is the univariate standard normal cumulative distribution function. Amemiya (1973) demonstrates that the Tobit parameters are efficient and consistent when computed with the maximum likelihood estimation process. The two-limit Tobit (hereafter Tobit) model specification and estimation procedures assume a homogeneous and normal distribution of the error terms.

Homogeneity. Maximum likelihood estimates are inconsistent for limited dependent variables models if the homogeneity assumption of errors is violated (Arabmazar and Schmidt 1981). The current study uses the Lagrange Multiplier (LM) test as described in Greene (2003) to test for homogeneity. When there is a violation of homogeneity, the Heteroscedasticity Tobit model (H-Tobit) is estimated using the exponential specification of the error variance (Greene).

Normality. The maximum likelihood estimation produces inconsistent estimates for limited dependent variable models if the normality assumption of errors is violated (Arabmazar and Schmidt 1982). This study tests for normality with the LM test formulated in Chesher and Irishand (1987) as described in Greene (2003). If non-normality is indicated by the LM test, the present research will examine the appropriateness of potential remedies.

Research Question 1

The present study assesses whether the deductibility of charitable bequests is a budget efficient tax policy. That is, does the tax-free status of charitable bequests stimulate more funds for not-for-profit organizations than is lost in tax revenue? The deductibility of charitable bequests is budget efficient when the tax price elasticity exceeds an absolute value of one.

Tax Price. Delineating the wealth and tax price effects is essential when assessing whether charitable bequests are influenced by estate taxes. Unfortunately, separating the wealth and tax price tax effects is difficult because the tax price is a function of wealth. After all, the tax price of charitable bequests is equal to one minus the marginal tax rate. Simultaneously, the marginal tax rate is contingent upon the estate size, i.e., wealth. The key to isolating the effects of wealth and tax price is finding sources of variation within the tax prices of decedents of similar wealth.

Kopczuk and Slemrod (2003) note that the tax price identification is easier if estates of equal wealth are compared in different tax regimes. As such, the current study relies on sources of tax price variation from temporal changes in federal estate taxes and exemption equivalent, differences in state death taxes, marital deduction, and broad tax brackets. Consistent with the majority of prior literature, the tax price coefficient is expected to be significantly negative.

Sources of Tax Price Variation. The data employed in this research inquiry has several sources of variation. For instance, the sample period extends over six years when the federal estate tax exemption equivalent increased twice. The net effect of these changes caused the exemption equivalent to increase from $675,000 to $1,500,000. In

addition, the maximum federal estate tax rate decreased from 55% to 47%. The date-of-will tax price also includes variation because the estate tax structure changed in periods prior to 2000.

Besides the variation created at the federal level, there are four sources of state tax-price variation. First, Louisiana collected an inheritance tax until July 1, 2004. As a result, Louisiana decedents with equal wealth have a different tax price as long as they do not have mirror image bequest patterns to a spouse, heirs, and charitable organizations. Second, the Louisiana inheritance tax was slowly phased out between July 1, 1998, and June 30, 2004. As such, Louisiana decedents with similar wealth levels and bequest patterns face different tax prices during this four and a half year period. Third, Virginia does not administer an inheritance tax. Thus, the decedents of Virginia and Louisiana of equal wealth levels have different tax-prices from January 1, 2000, through June 30, 2004. Broad tax brackets also induce variation because they assess a constant tax rate on decedents with a wide range of wealth. Fourth, Virginia collected estate taxes during the entire sample period while Louisiana did not collect estate taxes during 2005.

The Louisiana inheritance tax complicates the computation of its decedent's marginal tax rates. As mentioned in the first chapter, inheritance tax rates are determined by how much each classification of heirs or legatees receives. Consequently, a weighted average is constructed of the marginal tax rates that non-charity heirs would have paid in the absence of the charitable bequests while holding each heir's after-tax estate proportion constant. However, alternative formulations are made for those decedents who gave their entire estate to charitable organizations. If these decedents had children,

the marginal tax rate of the direct descendents is used. Otherwise, the non-related person's marginal tax rate is employed.

Consistent with the majority of prior research (e.g., Joulfaian 2000b, 2005), the predetermined marital deduction is used as a source of variation between married and unmarried decedents. That is, the marginal tax rate for married decedents is computed after subtracting the spousal bequest. Brunetti (2005) states the predetermined spousal bequest assumption does not necessarily bias results. However, Brunetti also finds that predetermined spousal bequest may create an incorrect model specification due to a lack of evidence that the spousal bequest was determined prior to the charitable bequest. Nonetheless, the current study utilizes the predetermined marital deduction because its contribution of tax price variation is deemed to outweigh the potential model misspecification if the final results are not biased.

First vs. Last Dollar Tax Price. The tax price is equal to one minus the marginal tax rate. There are two methods for computing the marginal tax rate. The first dollar tax price assumes that the correct marginal tax rate is the one applicable after the first dollar of charitable bequests is given. Alternatively, the last dollar tax price uses the marginal tax rate that is effective after reducing the estate by the last dollar of charitable bequests. Because the first dollar tax price is independent of the charitable bequest, it is frequently used in prior research (e.g., Boskin 1976; Barthold and Plotnick 1984; and Joulfaian 1991).

Joulfaian (2000b) states that the last dollar tax price might be more theoretically correct. Consequently, he performs analysis under both the first and last dollar tax price. Joulfaian (2000b) finds that the last dollar tax price coefficient and elasticity are smaller

than their first dollar counterparts; however, they remain significantly negative. Brunetti (2005) tests the last dollar tax price with the instrumental variable methodology. However, he exclusively reports the first dollar tax price regressions because his last dollar tax price conclusions are similar to the first dollar tax price findings. Joulafaian (2005) exclusively employs the last dollar tax price instrumented using the first dollar tax price on charitable bequests.

Notwithstanding the potential for theoretical improvements of the last dollar tax price, the current study employs the first dollar tax price for three reasons. First, the current study is unable to identify an independent variable that would allow for a model specification to address the inherent endogeneity of the last dollar tax price. Joulfaian (2000b, 2005) use the Fully Informative Maximum Likelihood (FIML) Tobit model to estimate the last dollar tax price. Unfortunately, at least one exclusion restriction is required for an FIML model (Bratti et al. 2004). An exclusion restriction is defined by Bradley et al. (2005) as having one independent variable in the FIML's first equation that is related to the first equation's dependent variable but is not correlated with the FIML's second equation's dependent variable. This requirement does not hold for Joulfaian who utilizes the following FIML Tobit equations:

$$\ln PL = \delta_P \ln P_F + \delta_W \ln W + \delta_X' X + u_2 \quad (6)$$

$$S = \alpha \ln P_L + \beta \ln W + \gamma' X + u_1 \quad (7)$$

where:

S = Charitable Bequests / Disposable Wealth
P_L = LDTP
W = Wealth
X = Control variables
P_F = FDTP

Specifically, $\ln P_F$ (first dollar tax price) is the only independent variable in equation (6) that is not in equation (7). However, the $\ln P_F$ variable does not meet the exclusion restriction requirements because it is correlated with equation (7)'s dependent variable (budget share allocated to charitable bequests). Second, the first dollar tax price is exogenous to the size of a decedent's charitable bequest. Third, the majority of prior studies report first dollar tax price results, making this study's results more comparable.

Tax Rate Structure Assumptions. Clotfelter (1985, 240) notes that sample periods containing frequent changes in estate tax rates will probably infuse error into the price term. That is, frequent changes make it difficult to ascertain which rates are influencing bequest decisions. Three tax rate structures can be assumed to stimulate a testator's bequest motives. In chronological order, they are the death rate structure in effect on the date-of-will, date-of-death, and the expected-date-of-death. While all estate tax research is able to test the date-of-death tax rates, only probate records provide the date-of-will information. The tax price at the decedents' expected date of death is computed using the United States Life Tables from the National Vital Statistics Reports (NVSR) (Arias 2002, 2004a, 2004b, 2007a, 2007b).[25]

Although, it is generally unclear if the testator's charitable bequests are based on the date-of-will or date-of-death tax regime, there is no debate if the will is revised in the year of death. Thus, another model is based on this unique sub-sample because these decedents are clearly not motivated by past tax rates.

[25] The expected date of death dates for 2005 decedents are based on the 2004 NVSR table (Arias 2007b) because 2005 was not available.

Elasticity of Tax Price. This study follows Joulfaian (2000b, 2005) to evaluate elasticities using the mean BSACB and the mean of z. That is, the tax price elasticity is equal to:

$$\eta_p = \frac{\beta_p}{BSACB}\Phi(z) - 1 \qquad (8)$$

where $\Phi(z)$ is the probability of charitable bequests being positive. The elasticity of the tax price is expected to be greater than -1.00.

Research Question 2

The estate tax creates two conflicting impacts upon charitable bequests. Research question two addresses the tax price incentive to leave more charitable bequests. On the other hand, the wealth available for charitable organizations is less when estate taxes are paid on the portion of the estate bequeathed to non-exempt entities (i.e., anyone except a spouse or charitable organization). Accordingly, it is important to ascertain whether wealth's elasticity is greater than unity.

Wealth. Naturally, there is a positive relationship between a decedent's ability to leave a charitable bequest and the size of their estate. At the same time, estate taxes lower a decedent's disposable wealth if a portion of the estate is left to anyone except a spouse or charitable organization. Thus, Joulfaian (2005, 3) notes that large wealth elasticities indicate a "dampening effect on giving" by the existence of the estate tax. For this reason, it is necessary to include the decedent's wealth as an explanatory variable in the charitable bequest equation. Pursuant to Joulfaian (2005), wealth is defined as the disposable wealth (i.e., $W - T_0$).

Elasticity of Wealth. This study follows Joulfaian (2000b, 2005) to evaluate elasticities using the mean BSACB and the mean of z. Specifically, wealth elasticity is equal to:

$$\eta_w = \frac{\beta_w}{BSACB}\Phi(z) + 1 \qquad (9)$$

The elasticity of wealth is expected to be greater than unity.

Research Question 3

The present study investigates the effects of changes in death taxes for residents of Louisiana and Virginia. Performing analysis over two states increases this inquiry's generality over previous single-state probate record endeavors. Examination of a single-state prevents prior probate record research from investigating the differences between community and non-community property states.[26] This inquiry, by contrast, examines probate records from a community (i.e., Louisiana) and non-community (i.e., Virginia) property state. In community property states, married decedents are required to report half of the wealth attained during marriage as their own. This systematic impact on the wealth variable could have important estate tax implications. As such, Boskin (1976) finds that community property decedents make significantly less charitable bequests under all model specifications except the least restrictive price term formulation.

Geographical differences may also create difference in bequest patterns. Joulfaian (2000b) reports that significantly more charitable bequests are given by decedents located in the North and Midwest regions of the United States. Meanwhile, Joulfaian (2005) finds decedents located in the West and South leave less to charity.

[26] The first probate data study, Barthold and Plotnick (1984), examines a common law property state, Connecticut. Meanwhile, the two more recent probate record studies analyze community property states. Specifically, Bennett (1990) analyzes Texas, and Brunetti (2005) assesses California.

Likewise, Havens and Schervish (2006) report that Virginia ranks 14th among all states in its giving when looking at the entire population relative to its financial capacity (i.e., income) to give while Louisiana ranks 25th. Consequently, it is expected that Louisiana decedents leave significantly less charitable bequests than their Virginia counterparts. Louisiana decedents are coded as "1" and Virginia residents take on the value of zero.

Research Question 4

The federal estate tax is scheduled to be phased out and eventually repealed in the year 2010 under **EGTRRA**. Although the repeal of the federal estate tax is currently scheduled to last only one year, there is strong support for a permanent repeal (Slemrod 2006). Accordingly, it is important to garner evidence concerning the repeal of the estate tax on charitable bequests. The estimated decrease in charitable bequests if the federal estate tax is repealed is estimated by Joulfaian (2000b, 2005) to be 12% and 12.9%, respectively. Brunetti (2005) predicts that the tax law changes in 2010 compared to 2001 will result in a 3.98% decrease in filers' charitable bequests.

Following Joulfaian (2005, p. 15), coefficient and standard error estimates for the wealth and price parameters are used to predict the change in charitable bequests for each observation. The first step is to calculate the expected value for each decedent's charitable bequest as follows:

$$CB = (W - T_0)\{\Phi[\beta_p \ln P + \beta_w \ln(W - T_0) + \beta_{loc} loc + \gamma Z] + \phi\sigma\} P^{-1} \quad (10)$$

Then, the predicted value from equation (11) is compared to the predicted value for each observation had the estate tax rates been equal to zero, or:

$$CB = W[\Phi(\beta_w \ln W + \beta_{loc} loc + \gamma Z] + \phi\sigma] \quad (11)$$

where P is the average tax price. Since there are contrasting forces that effect predicted

charitable bequests (i.e., wealth and tax price effect), this study has no *a priori* expectations as to the directional impact of repealing estate taxes.

Summary

Allowing deductible charitable bequests has provided the federal government with a powerful subsidizing mechanism for not-for-profit organizations. Also, charitable bequests represent a substantial portion of funding for many eleemosynary organizations. Nonetheless, there is strong support for the permanent repeal of estate taxes. As such, empirical evidence from timely and diverse charitable bequest decedents is crucial to project the impact of repealing estate taxes. This present study provides needed analysis by examining the five research questions stated in Chapter 1. This chapter presents the methodology by which these questions are tested. That is, the sampling procedure is explained, alternative statistical methodologies are contrasted, and variables of interest are discussed along with the means by which they are coded. Chapter 4 contains the results of the empirical investigation.

CHAPTER 4

ANALYSIS OF RESULTS

Previous chapters contain: (1) a discussion of tax policy issues created by the deductibility of charitable bequests for estate tax purposes and the need for further research, (2) a review of prior charitable bequest research that has a direct influence on the current study, and (3) the development of the methodology used in this research effort. Using the methodology of the empirical tests discussed in the previous chapter, I present the empirical analysis results in this chapter. Summary statistics of the data are presented first followed by the Tobit model results under different tax price assumptions. Last, a discussion of the results pertaining to each of the research questions is provided.

Summary Statistics of Input Data

This research endeavor examines probate records from Louisiana and Virginia, 450 records from each, respectively. Table 4.1 describes the key characteristics of the probate records 900 decedents. The sample means are computed with the SAS code that is detailed in Appendix A. Of these, approximately 32% (286 decedents) have a charitable bequest with the average amount being $397,088. The sample descriptive statistics also present preliminary evidence that the propensity to leave a charitable bequest is motivated by tax price. Specifically, observations with charitable bequests have a lower tax price than their non- bequeathing counterparts.

Table 4.1 Means of Key Variables

Variable	Entire Sample	Observations with CBs	Observations without CBs
Made a Charitable Bequest	31.8%	100.0%	0.0%
Charitable Bequest (in $)	126,186	397,088	0
Tax Price (date-of-death)	0.91	0.87	0.93
Gross Estate (in $)	826,298	1,052,974	720,713
Wealth (in $)	771,739	981,159	674,192
Married	31.6%	7.7%	42.7%
Male	43.9%	33.9%	48.5%
Children	1.59	0.61	2.05
Trust	16.9%	14.0%	18.2%
Business Share	2.3%	1.8%	2.5%
Age	80.5	83.5	79.2
Observations	900	286	614

Notes:
Tax prices are first dollar tax prices.

Both gross estate and wealth are larger for decedents with charitable bequests.[27] The gross estate imputation process described in Chapter 3 resulted in an average increase of $272,839 for the 102 probate records examined in this study that detailed the amounts paid for estate taxes.[28] Consistent with prior research, the percentage of married decedents with charitable bequests (7.7%) is considerably lower than the percentage of those without the bequests (42.7%). The observations with charitable bequests have a smaller percentage of males (33.9%) than the observations without charitable bequests (48.5%). Decedents with charitable bequests also have fewer surviving children. Trusts

[27] The overall average of the decedents' wealth in the current study ($771,740) is larger than the national average of $528,100 based on the 2004 Survey of Consumer Finances (Bucks et al. 2006). The national average is equal to the mean family net worth with a head of household who is 75 or more years old as reported on in the Bucks et al. (2006 A8). This age group is selected because the head of household is that the mean age of this study's decedents is 79 years old.

[28] Estate tax payment amounts are not available in all probate records because they are sometime aggregated together with other payments under generic descriptions, e.g., administration expenses.

are utilized more (18.2% vs. 14.0%) by decedents without charitable bequests, implying that trusts are employed as a substitute rather than a complement to tax avoidance using charitable bequests. Decedents leaving charitable bequests also have a lower business share, most likely business owners have a lower proportion of liquid assets to use for charitable bequests.[29]

Filers vs. Non-Filers

An important distinction between the probate records examined in this study is whether the decedent files a federal estate tax return or not. Table 4.2 presents the descriptive statistics filers and non-filers. Filers (36.7%) are more likely to leave charitable bequests than non-filers (30.2%).

Table 4.2 Means of Key Variables by Federal Estate Tax Return Filing Status

Variable	Filers	Non-Filers
Made a Charitable Bequest	36.7%	30.2%
Charitable Bequest (in $)	428,857	29,437
Tax Price (date-of-death)	0.65	0.996
Gross Estate (in $)	2,539,292	278,743
Wealth (in $)	2,395,815	252,607
Married	27.1%	33.0%
Male	43.6%	44.0%
Children	1.34	1.67
Trust	31.7%	12.2%
Business Share	6.0%	1.1%
Age	81.8	80.1
Observations	218	682

Notes:
Tax prices are first dollar tax prices.

[29] The subsequent descriptive statistics analysis is limited to notably large discrepancies between sub-samples. Furthermore, descriptive statistics regarding wealth are also not discussed because they are similar to the gross estate.

Moreover, the average charitable bequest given by filers ($428,857) is approximately 15 times larger than the bequest given by non-filers. Since Louisiana imposes inheritance taxes, non-filers have a tax incentive to leave charitable bequests. Nonetheless, it is clear from Table 4.2 that the tax incentive to leave charitable bequests for non-filers is still less than for filers. Despite the mean tax price for non-filers being 0.996, the tax price for non-filers range from 0.92 to 1.00.

The average gross estate of filers ($2,539,292) is almost 10 times larger than the average gross estate of non-filers ($278,743). It is worthwhile to note that the filers' average gross estate is comparable to the average gross estate ($2,557,888) reported on federal estate tax returns during the sample period of 2000-2005.[30]

More non-filers are married (33.0%) than filers (27.1%). Filers utilize trusts at a higher rate than non-filers, 31.7% as compared to 12.2%. Because filers have larger amounts of wealth, they have both the means and the need to utilize trusts more frequently. Likewise, filers' have larger business shares (6.0%) than non-filers (1.1%).

Virginia Sample

Descriptive statistics of the Virginia observations are recorded in Table 4.3. One unique aspect of the Virginia decedents is that a larger portion of non-filers make charitable bequests (46.2%) than do filers (44.9%). Nevertheless, the average charitable bequest is substantially larger for filers ($547,322) than for non-filers ($55,081).

[30] The average gross estate reported on federal estate tax returns is calculated from the Internal Revenue Service (IRS) Statistics of Income (SOI) Estate Tax Data Tables, Filing Years 2000 through 2005 last accessed on May 14, 2008 at http://www.irs.gov/taxstats/indtaxstats /article/0,,id=96442,00.html#2.

Table 4.3 Means of Key Variables for Virginia Observations by Federal Estate Tax Return Filing Status

Variable	Filers	Non-Filers	Entire Virginia Sample
Made a Charitable Bequest	44.9%	46.2%	45.8%
Charitable Bequest (in $)	547,322	55,081	203,847
Tax Price (date-of-death)	0.62	1.00	0.88
Gross Estate (in $)	2,654,998	364,857	1,056,988
Wealth (in $)	2,510,911	327,995	987,721
Married	16.9%	14.3%	15.1%
Male	39.7%	36.6%	37.6%
Children	1.12	1.23	1.20
Trust	36.0%	21.0%	25.6%
Business Share	7.4%	1.7%	3.4%
Age	82.7	81.6	82.0
Observations	136	314	450

Notes:
Tax prices are first dollar tax prices.

Similar to the overall sample, the tax price is larger for filers than for non-filers. The mean tax price for non-filers is 1.00 because the Virginia inheritance tax was repealed in the 1970s and the state level estate taxes did not affect this study's non-filers in 2005.

The average gross estate of filers in Virginia ($2,654,998) is much larger than that of non-filers ($364,857). The propensity to utilize trusts is greater among filers (36.0%) than non-filers (21.0%). Likewise, the average filers' business share (7.4%) is greater than that of non-filers (1.7%).

Louisiana Sample

Table 4.4 describes the Louisiana probate records. Here it is shown that non-filers (16.6%) are less likely to give charitable bequests than are filers (23.2%). In a

similar fashion, charitable bequests from non-filers ($7,557) are considerably smaller than the bequests from their filer counterparts ($232,378).

Table 4.4 Means of Key Variables for Louisiana Observations by Federal Estate Tax Return Filing Status

Variable	Filers	Non-Filers	Entire Louisiana Sample
Made a Charitable Bequest	23.2%	16.6%	17.8%
Charitable Bequest (in $)	232,378	7,557	48,524
Tax Price (date-of-death)	0.70	0.99	0.94
Gross Estate (in $)	2,347,387	205,266	595,608
Wealth (in $)	2,204,923	188,281	555,758
Married	43.9%	48.9%	48.0%
Male	50.0%	50.3%	50.2%
Children	1.72	2.05	1.99
Trust	24.4%	4.6%	8.2%
Business Share	3.7%	0.6%	1.2%
Age	80.4	78.8	79.1
Observations	82	368	450

Notes:
Tax prices are first dollar tax prices.

As noted in Chapter 3, the tax price variation for Louisiana decedents is increased when the inheritance tax exceeds the state death tax credit. In the current study, the inheritance tax exceeds the state death tax credit for 64.6% of the Louisiana decedents. As a result, the Louisiana inheritance tax increases the tax price variation for this study's filers and non-filers. Nonetheless, there are two main reasons why Louisiana non-filers' average tax price close to 1.00. First, as with the federal estate tax, the Louisiana inheritance tax allows for tax-free bequests to spouses. Second, the Louisiana inheritance tax was phased out during the sample period.

The gross estate of Louisiana filers ($2,347,387) is over ten times as large as that of non-filers ($205,266). Trust usage is more prevalent among filers (24.4%) than among non-filers (4.6%). Likewise, the average filers' business share (3.7%) is larger than that of non-filers (0.6%).

A Comparison of Virginia and Louisiana Filers

The current study is the first to analyze probate records from two states. As a result, it is important to assess diversity gained by expanding the study beyond a singular state. Since the majority of charitable bequests are given by filers, Table 4.5 presents a direct comparison of the Virginia and Louisiana filer samples.

Table 4.5 Means Of Key Variables for Filers of Federal Estate Tax Returns in Virginia and Louisiana

Variable	Virginia Filers	Louisiana Filers
Made a Charitable Bequest	44.9%	23.2%
Charitable Bequest (in $)	547,322	232,378
Tax Price (date-of-death)	0.62	0.70
Gross Estate (in $)	2,654,998	2,347,387
Wealth (in $)	2,510,911	2,204,923
Married	16.9%	43.9%
Male	39.7%	50.0%
Children	1.12	1.72
Trust	36.0%	24.4%
Business Share	7.4%	3.7%
Age	82.7	80.4
Observations	136	82

Notes:
Tax prices are first dollar tax prices.

The proportion of Virginia filers giving charitable bequests (44.9%) is almost twice that of Louisiana filers (23.2%). Moreover, the value of the Virginia filers' charitable bequests ($547,322) is also twice as large as the Louisiana filers' charitable bequests ($232,378). As expected in light of the large difference in both the propensity to give and the amount given, there is a substantial difference in the tax price and overall wealth between the decedents from the two states. The Virginia filers face a lower tax price and have slightly larger gross estates.

The remaining demographic variables provide additional explanations as to why filers in Louisiana leave substantially less to charity. First, a larger portion of Louisiana filers are married (43.9%) than that of Virginia filers (16.9%). Second, Louisiana filers have more surviving children than Virginia filers. Third, Louisiana filers utilize trusts less often (3.7%) than Virginia filers (7.4%). Hence, examining decedents from two states enhances the generality of this study's results.

Model Specification

Tobit regression is the traditional econometric technique used to examine the impact of the estate tax on charitable bequests. Unfortunately, Tobit models utilize the maximum likelihood estimation, which produces inconsistent estimates when the error disturbance assumption of homogeneity and normality are violated (Arabmazar and Schmidt 1981, 1982). Previous estate tax research does not indicate the testing of these assumptions or potential remedies to the assumption violation.

The current study uses the Lagrange Multiplier (LM) test as described in Greene (2003) to test for homogeneity. Appendix B contains the SAS code for the Tobit regression along with tests for the homogeneity and normality assumptions. In the test,

the degrees of freedom for the LM test statistic are equal to the number of variables that may be related to the violation of constant error variances. Since no a priori expectations are available for identifying the heterogeneity variables, this study takes a conservative approach by assuming one degree of freedom. When there is a violation of homogeneity, the Heteroscedasticity Tobit model (H-Tobit) is estimated using the exponential specification of the error variance (Greene). Appendix C provides the SAS code for the H-Tobit regression. Based on the 90% chi-squared value with one degree of freedom, 2.71, the homogeneity assumption is rejected in all models estimated in this study. For direct comparison purposes, both the Tobit and H-Tobit results are reported in the tables.

When examining the normality assumption of error variances, this study uses the Chesher and Irishand (1987) version of the LM test as described in Greene (2003). Based on the 90% chi-squared value with two degrees of freedom, 4.61, the assumption of normality is rejected in all models estimated in this study with LM statistics ranging from 30.63 to 132.31. Greene suggests that an alternative distribution may be utilized in the presence of non-normality. However, Greene (2003, 771) also states that assuming another distribution "does not necessarily solve the problem and may make it worse." The Box-Cox (BC) transformation is another technique used to address the non-normality issue. Amemiya and Powell (1981) note that a BC transformed variable cannot strictly be normal unless the transformation parameter of lamda is zero. As lamda approaches to zero, the BC transformation becomes the logarithm transformation of the dependent variable. Unfortunately, the current study has an abundance of zero values for the dependent variable, making the logarithm transformation mathematically impossible. A solution to address this problem is to add a small value to the dependent variable (e.g.,

Atkinson and Halvorsen 1990). However, Burbridge et al. (1988) state that the BC model may not be suitable for zero-value observations that are replaced with other values. Consequently, the BC transformation is not utilized in this study. Rather, the econometric contributions of this study are addressing heteroscedasticity and bringing awareness to the presence of non-normality.

Date-of-Death Tax Price Assumption

Filers

The first group of decedents analyzed under the date-of-death (DOD) tax price assumption is filers. This sample is of particular interest because they have a higher tendency to leave charitable bequests and the average charitable bequest is normally 10 times larger than that of non-filers. Table 4.6 reports the traditional Tobit model for filers as model (1). With the LM statistic of 6.42, the assumption of homogeneity is rejected. The Tobit model is estimated with the adjustment for heteroscedasticity and the result is reported as model (2).

Table 4.6 Tobit and H-Tobit Regressions Assuming DOD Tax Prices

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
ln Tax Price	0.0397	-0.2135	-8.6955	-9.4776	0.0502	0.0698
	(0.8515)	(0.4991)	(0.0001)	(0.0001)	(0.6302)	(0.5185)
ln Wealth	0.2885	0.2466	0.0564	0.1192	0.0620	0.0553
	(0.0052)	(0.0388)	(0.0112)	(0.0007)	(0.0027)	(0.0080)
Location	-0.2765	-0.3026	-0.4229	-0.4164	-0.2654	-0.2719
	(0.0136)	(0.0107)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Business Share	-0.2481	-0.3098	-0.2925	-0.2493	-0.1179	-0.0939
	(0.3824)	(0.2906)	(0.4367)	(0.4539)	(0.5871)	(0.7053)
Children	-0.1319	-0.1436	-0.1631	-0.1465	-0.1683	-0.2417
	(0.0003)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Age	0.0017	0.0021	0.0033	0.0045	0.0030	0.0026
	(0.6736)	(0.6116)	(0.2274)	(0.0986)	(0.1812)	(0.2648)
Gender	-0.1413	-0.1747	0.0552	0.0567	0.0126	0.0173
	(0.1679)	(0.0958)	(0.3522)	(0.3229)	(0.8076)	(0.7477)
Trust	-0.1045	-0.0596	-0.2495	-0.2423	-0.1704	-0.2701
	(0.3488)	(0.5972)	(0.0040)	(0.0029)	(0.0120)	(0.0091)
Marital Status	-0.3717	-0.3611	-0.3799	-0.3517	-0.4250	-0.4769
	(0.0381)	(0.0800)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Constant	-0.0182	-0.1848	-0.0157	-0.0582	-0.0001	0.0784
	(0.9593)	(0.6403)	(0.9479)	(0.8053)	(0.9997)	(0.7030)
Sigma	0.5567	0.7529	0.5174	0.4024	0.5414	0.5060
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
_H.*ln*_Tax Price	—	1.0100	—	—	—	—
	—	(0.0999)	—	—	—	—
_H.*ln*_Wealth	—	—	—	-0.2858	—	—
	—	—	—	(0.0015)	—	—
_H.Children	—	—	—	—	—	0.1447
	—	—	—	—	—	(0.0219)
_H.Trust	—	—	—	—	—	0.4626
	—	—	—	—	—	(0.0729)

Price Elasticity	-0.9140	-1.4926	-17.2965	-11.6462	-0.8980	-0.9008
Wealth Elasticity	1.6248	1.5691	1.1057	1.1339	1.1260	1.0785
Observations	218	218	682	682	900	900

Notes:
The dependent variable is BSACB.
Tax Price variable is for the DOD tax price.
Parameter estimate of *ln Wealth* is multiplied by 10^6.
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.
P-values are in parentheses.
_H. estimates include the parameters of and p-values of the independent variables that the H-Tobit model identified as significantly explaining the violation of homogeneity as described in Greene (2003, 769).

Tax price is insignificantly negative; however, the tax price elasticity is -1.49. The BSACB is increasing in wealth with an elasticity of 1.57. The negative relation between the BSACB and the dummy variable for the location provides evidence that Louisiana decedents bequeath significantly less to charity after controlling for other characteristics of the decedents. This result presents further evidence that probate studies can examine multiple states to improve the generality of their results.[31]

Non-Filers

The next subsample of interest is non-filers. Although this sample provides fewer and smaller charitable bequests, they are still of importance for several reasons. First, with charitable bequests by non-filers amounting to approximately $21 million, an examination of this subsample may be of value to eleemosynary organizations. Second, several states may decouple their estate tax structure from the federal system if the equivalent exemptions remain at the current high levels.

Table 4.6 reports the Tobit model for non-filers as model (3). However, the error distribution assumption of homogeneity is rejected (LM = 35.76). As a result, the

[31] The discussion of the Tobit and H-Tobit models is limited to the charitable bequest tax price, wealth, and location variables because these variables are tied to this study's research questions. The remaining explanatory variables are included to control for other characteristics of the decedent sample.

following discussion is based on the fourth model in Table 4.6. Tax price for non-filers is significantly negative with a corresponding elasticity of -11.65. This substantially large tax price elasticity indicates that eleemosynary organizations funding from non-filers is dramatically reduced when tax incentives for leaving charitable bequests are decreased. Consistent with the finding related to the filers, wealth is significantly positive with an elasticity of 1.13 for non-filers. As with the filers, there is a negative correlation between the BSACB and the location dummy variable.

Entire Sample

Overall trends in charitable bequests are evidenced in the entire sample models in Table 4.6. The assumption of homogeneity for the entire sample is rejected (LM = 39.66). As a result, the following discussion is based on model (6) in Table 4.6. Consistent with the results for the subsamples, the BSACB is not significantly related to tax price. The corresponding tax price elasticity is -0.90. Wealth, by contrast, is significantly positive with an elasticity that exceeds the unity. Location is significantly negative, suggesting that Louisiana decedents bequeath a lower proportion of their overall budget to charitable organizations.

Date-of-Will Tax Price Assumption

Filers

Besides the DOD tax system, the tax structure (i.e., marginal estate tax rates, exemption equivalent amounts, and treatment of spousal bequests) effective when a decedent last revised his/her will is another plausible source of tax prices. As such, the first model in Table 4.7 reports the Tobit model for decedents classified as filers at the date-of-will (DOW). The number of decedents classified as filers is larger under the

DOW (299) than the under the DOD (218) tax price assumption because the exemption equivalent amounts are smaller at the date of will.

Table 4.7 Tobit and H-Tobit Regressions Assuming DOW Tax Prices

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
ln Tax Price	-0.3156	—	-7.8132	-6.9953	-0.0554	-0.0570
	(0.1320)	—	(0.0000)	(0.0002)	(0.6003)	(0.6041)
ln Wealth	0.0940	—	0.0531	0.0961	0.0503	0.0419
	(0.1806)	—	(0.0320)	(0.0077)	(0.0208)	(0.0571)
Location	-0.3317	—	-0.5351	-0.4904	-0.2669	-0.2739
	(0.0004)	—	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Business Share	-0.1524	—	-0.2457	-0.3294	-0.1229	-0.1052
	(0.5519)	—	(0.5288)	(0.4204)	(0.5698)	(0.6695)
Children	-0.1540	—	-0.1405	-0.1347	-0.1673	-0.2384
	(0.0000)	—	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Age	0.0022	—	0.0013	0.0020	0.0030	0.0026
	(0.5179)	—	(0.6720)	(0.5211)	(0.1790)	(0.2550)
Gender	-0.1089	—	0.0753	0.0952	0.0135	0.0179
	(0.1874)	—	(0.2497)	(0.1397)	(0.7934)	(0.7389)
Trust	-0.0654	—	-0.3456	-0.6075	-0.1746	-0.2720
	(0.4725)	—	(0.0008)	(0.0133)	(0.0097)	(0.0079)
Marital Status	-0.2150	—	-0.3694	-0.3601	-0.4090	-0.4565
	(0.1493)	—	(0.0002)	(0.0002)	(0.0000)	(0.0000)
Constant	-0.1322	—	0.1165	0.1152	-0.0328	0.0355
	(0.6703)	—	(0.6602)	(0.6674)	(0.8696)	(0.8640)
Sigma	0.5182	—	0.5322	0.4178	0.5390	0.5049
	(0.0000)	—	(0.0000)	(0.0000)	(0.0000)	(0.0000)
_H.*ln*_Wealth	—	—	—	-0.2109	—	—
	—	—	—	(0.0267)	—	—
_H.Children	—	—	—	—	—	0.1409
	—	—	—	—	—	(0.0256)
_H.Trust	—	—	—	0.8937	—	0.4466
	—	—	—	(0.0776)	—	(0.0810)

Price Elasticity	-1.6984	—	-15.3177	-8.4864	-1.1136	-1.0827
Wealth Elasticity	1.2080	—	1.0972	1.1029	1.1032	1.0608
Observations	299	299	601	601	900	900

Notes:
The dependent variable is BSACB.
Tax Price variable is for the DOW tax price.
Parameter estimate of *ln Wealth* is multiplied by 10^6.
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.
P-values are in parentheses.
_H. estimates include the parameters of and p-values of the independent variables that the H-Tobit model identified as significantly explaining the violation of homogeneity as described in Greene (2003, 769).

The homogeneity assumption is rejected with a LM value of 7.57. Nonetheless, the H-Tobit model is not reported because the model cannot identify the independent variable(s) that significantly explain the violation of homogeneity.[32] Neither the tax price nor the wealth is a significant determinant of BSACB. The corresponding tax price and wealth elasticities are -1.70 and 1.21. There is a significant negative relation between Location and BSCACB.

Non-Filers

Table 4.7 presents the Tobit model for non-filers as model specification (3). However, the error distribution assumption of homogeneity is rejected (LM = 34.72). As a result, the following discussion is based on the fourth model of Table 4.7. Similar to the results under the DOD assumption, tax price has a significant and large effect on BSACB. The coefficient of tax price is -6.9953, significant at the 1 percent level, and the tax price elasticity is -8.49. Though wealth has a significant positive effect on BSACB, the wealth effect is moderate relative to the tax price effect. BSACB is negatively related to the dummy variable location.

[32] The contradiction between the LM test and the H-Tobit estimation may be a result of using a conservative LM critical value with only one degree of freedom. Nevertheless, the conservative LM approach is employed due to the ramifications of failing to detect the violation of homogeneity.

Entire Sample

The error distribution assumption of homogeneity for the entire sample is rejected (LM = 39.52). As a result, the following discussion is based on the sixth model of Table 4.7. Wealth and location are significant determinants of BSACB with controlling for the decedents' other characteristics. In contrast, tax price does not have a significant effect on BSACB. Though tax price and wealth have different explanatory power, the magnitude of the effects of the two variables is similar, as shown by their corresponding elasticities of -1.08 and 1.06.

Expected Date-of-Death Tax Price Assumption[33]

Filers

Besides the tax structure at the date of death or date of will, it is possible that bequests are determined based on the tax prices anticipated at a decedent's expected date of death. As a result of scheduled increases in the exemption equivalent, there are 164 decedents classified as filers under the expected-date-of-death (EDOD) assumption.[34] Model (2) of Table 4.8 reports the H-Tobit results for the EDOD filers because the homogeneity assumption is rejected with a LM value of 3.43.

[33] There is no non-filer sample under the EDOD tax price assumption. Because all non-filers have the same charitable bequest tax price of 1.00, there is no variation in tax price. Hence, it is not possible to estimate the tax price variable for non-filers under the EDOD assumption.

[34] The exemption equivalent increases from 2006-2009. Furthermore, there are no federal estate taxes scheduled for 2010 before the federal estate tax is reintroduced in 2011 at its 2001-2002 schedules.

Table 4.8 Tobit and H-Tobit Regressions Assuming the EDOD Tax Prices

	Filers	
	(1)	(2)
	Tobit	H-Tobit
ln Tax Price	-0.0162	0.0560
	(0.9547)	(0.5636)
ln Wealth	0.2306	0.0029
	(0.0287)	(0.9065)
Location	-0.2586	0.0049
	(0.0484)	(0.8942)
Business Share	-0.1412	-0.1029
	(0.6268)	(0.4041)
Children	-0.1937	0.0078
	(0.0000)	(0.1428)
Age	0.0022	0.0037
	(0.6223)	(0.0313)
Gender	-0.1126	0.0140
	(0.3056)	(0.5250)
Trust	-0.0947	-0.0505
	(0.4767)	(0.2218)
Marital Status	-0.4007	0.0103
	(0.0582)	(0.7642)
Constant	0.0344	-0.3365
	(0.9309)	(0.0204)
Sigma	0.5276	0.6239
	(0.0000)	(0.0000)
_H.*ln*_ Wealth	—	0.8816
	—	(0.0116)
_H.Business Share	—	2.9325
	—	(0.0254)
_H.Children	—	-1.4195
	—	(0.0000)
_H.Marital Status	—	-2.7289
	—	(0.0148)

Price Elasticity	-1.0314	-0.8419
Wealth Elasticity	1.4465	1.0082
Observations	164	164

Notes:
The dependent variable is BSACB.
Tax Price variable is for the EDOD tax price.
Parameter estimate of *ln Wealth* is multiplied by 10^6.
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.
P-values are in parentheses.
_H. estimates include the parameters of and p-values of the independent variables that the H-Tobit model identified as significantly explaining the violation of homogeneity as described in Greene (2003, 769).

The H-Tobit adjustment has several important impacts on the EDOD results in Table 4.8. First, tax price coefficient estimate is positive from the H-Tobit model while it has a negative coefficient from the Tobit model. The H-Tobit results show that tax price is inelastic; however, the Tobit results indicate that the tax price is elastic. Second, wealth becomes insignificant with the adjustment for heteroscedasticity in error distribution. The wealth effect also becomes smaller. Third, the significant location effect disappears after adjusting for the heteroscedasticity.

Tax Regime Restriction

Researchers assume the tax price structure (i.e., marginal tax rates, exemption equivalent amounts, and treatment of spousal bequests) effective at the DOD, the DOW, or the EDOD when examining the impact of estate taxes on charitable bequests. However, it is not possible to know for sure which of these tax price structures is actually utilized by decedents. To reduce the ambiguity, decedents who updated their wills during the tax regime existing at the time of their death are identified (i.e., the tax regime

restriction). Unfortunately, this tax regime restriction dramatically reduces the sample size.[35]

Filers

The first model in Table 4.9 presents the Tobit model for decedents classified as filers at their DOD. The homogeneity assumption is rejected with an LM value of 8.45. Nevertheless, the H-Tobit model is not reported because the model cannot identify the independent variable(s) that significantly explain the violation of homogeneity. Tax price has a significant negative effect. Additionally, with an elasticity of -1.45, the price effect has a large magnitude. In contrast, there is no significant wealth effect. Different from prior model results, the wealth elasticity of 0.94 is below the unity. This result may be created by the failure to address the violation of the homogeneity assumption. Similar to the EDOD H-Tobit results, the decedents' location has no impact BSACB.

[35] The sample of filers under the tax regime restriction should be interpreted with caution due to its small sample size. Long (1997) recommends that maximum likelihood estimations have at least 10 observations for every estimated parameter. However, this study has a sample of 47 filers under the tax regime restriction, making the Tobit model results questionable.

Table 4.9 Tobit and H-Tobit Regressions under the Tax Regime Restriction

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
ln Tax Price	-2.9136	—	-3.2461	-2.6632	-0.1642	-0.2520
	(0.0038)	—	(0.5066)	(0.4318)	(0.4015)	(0.2254)
ln Wealth	-0.3844	—	-0.0012	-0.0028	-0.0193	-0.0346
	(0.2071)	—	(0.9783)	(0.9506)	(0.6412)	(0.4260)
Location	0.3604	—	-0.3981	-0.3462	-0.3419	-0.3400
	(0.2439)	—	(0.0102)	(0.0262)	(0.0031)	(0.0050)
Business Share	-1.2009	—	-0.4084	-0.3599	-0.5519	-0.4417
	(0.3953)	—	(0.7922)	(0.8218)	(0.6031)	(0.7162)
Children	-0.5542	—	-0.0747	-0.0742	-0.0947	-0.2147
	(0.0002)	—	(0.0583)	(0.0630)	(0.0067)	(0.0194)
Age	0.0179	—	0.0123	0.0125	0.0092	0.0085
	(0.0165)	—	(0.0333)	(0.0253)	(0.0374)	(0.0598)
Gender	-0.6332	—	0.0456	0.0193	-0.0277	-0.0360
	(0.0024)	—	(0.7107)	(0.8669)	(0.7843)	(0.7321)
Trust	0.3082	—	-0.3333	-0.2979	-0.2184	-0.2010
	(0.0889)	—	(0.0370)	(0.0631)	(0.0821)	(0.1229)
Marital Status	0.9065	—	-0.4088	-0.4650	-0.4040	-0.4556
	(0.0252)	—	(0.0419)	(0.0274)	(0.0141)	(0.0275)
Constant	-2.8346	—	-0.7506	-0.7681	-0.5491	-0.4634
	(0.0072)	—	(0.1366)	(0.1187)	(0.1605)	(0.2482)
Sigma	0.2968	—	0.4916	0.5150	0.4922	0.4658
	(0.0000)	—	(0.0000)	(0.0000)	(0.0000)	(0.0000)
_H.*ln*_Tax Price	—	—	—	26.2196	—	—
	—	—	—	(0.0993)	—	—
_H.Children	—	—	—	—	—	0.2209
	—	—	—	—	—	(0.0847)
Price Elasticity	-1.4472	—	-7.8810	-6.8552	-1.3572	-1.3661
Wealth Elasticity	0.9410	—	0.9974	0.9939	0.9580	0.9497
Observations	47	47	129	129	176	176

Notes:
The dependent variable is BSACB.
Tax Price variable is for the DOD tax price.
Parameter estimate of *ln Wealth* is multiplied by 10^6.
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.
P-values are in parentheses.
_H. estimates include the parameters of and p-values of the independent variables that the H-Tobit model identified as significantly explaining the violation of homogeneity as described in Greene (2003, 769).

Non-Filers

The Tobit model estimation for non-filers under the tax regime restriction is reported in the third model of Table 4.9. Because homogeneity is rejected (LM = 5.04), an H-Tobit model is reported for the non-filers as the fourth model specification.

Though the elasticity of -6.86 suggests a considerably large tax price effect, tax price has no significant explanatory power to explain the variation in BSACB across non-filers. There is also no significant wealth effect. The wealth elasticity of 0.99 suggests that the change in wealth does not result in a dramatic change in BSACB. Moreover, there is no significant association of BSACB and location.

Entire Sample

The assumption of homogeneity for the entire sample is rejected (LM = 3.74). As a result, the following discussion is based on the sixth model of Table 4.9. Neither tax price nor wealth is significant determinants of BSACB. However, the change in tax price induces a larger change in BSACB than the change in wealth. In contrast, the coefficient of location is significantly negative.

Research Question Analysis

Research Question 1

R1: Is the deductibility of charitable bequests a budget efficient tax policy? That is, does a 1% change in the tax price lead to a larger than 1% change in charitable bequests?

One important contribution of research regarding how estate taxes influence charitable bequests is the assessment as to whether or not the deductibility of charitable bequests is a budget efficient policy. The elasticity of tax price is used to reach the conclusion. The tax price elasticities estimated from all models reported earlier in this chapter are summarized in Table 4.10 in order to facilitate an overall conclusion as to the budget efficiency of deductible charitable bequests.

Table 4.10 Tax Price Elasticities by Filing Status, Heteroscedastic Specification, and Tax Price Date Assumptions

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Assumption	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
I. DOD TP	-0.9140	-1.4926	-17.2965	-11.6462	-0.8980	-0.9008
II. DOW TP	-1.6984	—	-15.3177	-8.4864	-1.1136	-1.0827
III. EDOD TP	-1.0314	-0.8419	—	—	—	—
IV. Tax Regime Restriction	-1.4472	—	-7.8810	-6.8552	-1.3572	-1.3661

Notes:
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.

As shown in Table 4.10, tax price elasticities have absolute values larger than one. The results suggest that a greater percentage of wealth is being bequeathed to eleemosynary organizations than that being forgone in tax revenues. This supports the conclusion that the deductibility of charitable bequests is, indeed, a budget efficiency policy. Table 4.10 also reveals two additional noteworthy trends. First, tax price elasticities are substantially larger for filers than for non-filers. Second, correcting for heteroscedasticity has an impact on the tax price elasticities for subsamples of filers and non-filers. As such, future studies on the impact of tax price should take the error distribution into consideration.

Table 4.11 presents a comparison of this study's results and those of prior research. Overall, this study's results concerning tax price elasticities are consistent with prior study results. For example, similar to Brunetti (2005), this study finds an elastic tax price effect for filers under the DOD and DOW assumptions as well as the tax regime restriction. Additionally, Brunetti and the current study report that tax price elasticity for non-filers is considerably larger than that for filers.

Table 4.11 Comparisons of Tax Price Elasticities by Filing Status, and Tax Price Date Assumptions with Prior Studies

Assumption	Filers	Non-Filers	Entire Sample
I. DOD TP			
Current Study	-1.4926	-11.6462	-0.9008
Brunetti (2005)	-1.2500	-6.1100	-0.6000
Bennett (1990) (TP < .60)			
(TP < .60)	—	—	-1.2300
(.80 > TP ≥ .60)	—	—	-2.0900
(TP ≥ .80)	—	—	-3.1200
Barthold and Plotnick (1984)	No effect	—	—
Joulfaian (2005)	-1.2100	—	—
Joulfaian (2000b)	-2.4820	—	—
Boskin (1976): (1957-1959 data)			
(TP < .60)	-0.9000	—	—
(.80 > TP ≥ .60)	-1.4000	—	—
(TP ≥ .80)	-1.8000	—	—
Boskin (1976): (1969 data)			
(TP < .60)	-0.2000	—	—
(.80 > TP ≥ .60)	-0.9600	—	—
(TP ≥ .80)	-2.5300	—	—
II. DOW TP			
Current Study	-1.6984	-8.4864	-1.0827
Brunetti (2005)	-1.2300	-2.2300	-0.3100
III. EDOD TP			
Current Study	-0.8419	—	—
Brunetti (2005)	-0.4500	—	—
IV. Tax Regime Restriction			
Current Study	-1.4472	-6.8552	-1.3661
Brunetti (2005)	-1.8000	-4.9100	—

Notes:
Current study's elasticities are from the H-Tobit models except for filers under the assumptions of DOW and tax regime restriction samples.
Brunetti's (2005) elasticities are from the model that includes both wealth and wealth squared terms.
Bennett's (1990) elasticities are from the linear model with the dollar amount of charitable bequests as the dependent variable. There are also three separate adjusted disposable wealth effects, each corresponding to estates represented by the three tax price classifications.
Barthold and Plotnick's (1984) elasticities are from the model with the logarithm of (the dollar amount of charitable bequests + 1) as the dependent variable.
Joulfaian's (2005) elasticities are from the model with the dependent variable of CB(1-T')(W-To).
Joulfaian's (2000b) elasticities are from the model with the dependent variable of [CB-(To-T)]/(W-To).
Boskin's (1976) elasticities are from the first specification in Table 4 reported in the original paper.

Research Question 2

R2: Is the wealth elasticity above unity?

Another important component of research regarding how estate taxes influence charitable bequests is to gauge whether the elasticity of decedents' wealth exceeds unity. Table 4.12 summarizes all wealth elasticities estimated in the current study. Wealth elasticities are consistently above the unity under the DOD, DOW, and EDOD tax price assumptions. By contrast, the sample with the tax regime restriction that reduces the ambiguity regarding the tax price assumption has wealth elasticities below the unity. However, the wealth elasticities under the tax regime restriction are very close to unity because they are at least 0.94. The results in Table 4.12 generally support that the elasticity of wealth exceeds the unity.

Table 4.12 Wealth Elasticities by Filing Status, Heteroscedastic Specification, and Tax Price Date Assumptions

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Assumption	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
I. DOD TP	1.6248	1.5691	1.1057	1.1339	1.1260	1.0785
II. DOW TP	1.2080	—	1.0972	1.1029	1.1032	1.0608
III. EDOD TP	1.4465	1.0082	—	—	—	—
IV. Tax Regime Restriction	0.9410	—	0.9974	0.9939	0.9580	0.9497

Notes:
This study follows Joulfaian (2000b) to evaluate elasticities using the mean BSACB and the mean of z.

Table 4.13 presents the current study's wealth elasticities along with prior research results. For filers, the current research efforts show results consistent with prior research findings. However, there is a discrepancy in the magnitude of wealth elasticities between the current study and Brunetti (2005) under the tax regime restriction. This may

be partially attributable to the current study's smaller sample of filers. For non-filers, the wealth elasticity of the current study has a similar magnitude when compared to that of Brunetti under the tax regime restriction, a condition of less ambiguity. Further, for the entire sample, both the current study and Brunetti show the wealth elasticities above the unity under the DOD and the DOW tax price structures.

Table 4.13 Comparisons of Wealth Elasticities by Filing Status, and Tax Price Date Assumptions with Prior Studies

Assumption	Filers	Non-Filers	Entire Sample
I. DOD TP			
Current Study	1.5691	1.1339	1.0785
Brunetti (2005)	1.1300	0.7300	1.0600
Bennett (1990)			
Wealth related to (TP < .60)			0.6090
Wealth related to (.80 > TP ≥ .60)			0.5920
Wealth related to (TP ≥ .80)			0.5830
Barthold and Plotnick (1984)	0.4400	—	—
Joulfaian (2005)	1.1600	—	—
Joulfaian (2000b)	1.1650	—	—
Boskin (1976):			
(1957-1959 data)	0.5400	—	—
(1969 data)	0.4000	—	—
II. DOW TP			
Current Study	1.2080	1.1029	1.0608
Brunetti (2005)	1.0700	0.7100	1.1200
III. EDOD TP			
Current Study	1.0082	—	—
Brunetti (2005)	1.2200	—	—
IV. Tax Regime Restriction			
Current Study	0.9410	0.9939	0.9497
Brunetti (2005)	1.1900	1.0300	—

Notes:
Current study's elasticities are from the H-Tobit models except for filers under the assumptions of DOW and tax regime restriction samples.
Brunetti's (2005) elasticities are from the model that includes both wealth and wealth squared terms.
Bennett's (1990) elasticities are from the linear model with the dollar amount of charitable bequests as the dependent variable. There are also three separate adjusted disposable wealth effects, each corresponding to estates represented by the three tax price classifications.
Barthold and Plotnick's (1984) elasticities are from the model with the logarithm of (the dollar amount of charitable bequests + 1) as the dependent variable.
Joulfaian's (2005) elasticities are from the model with the dependent variable of CB(1-T')(W-To).
Joulfaian's (2000b) elasticities are from the model with the dependent variable of [CB-(To-T)]/(W-To).
Boskin's (1976) elasticities are from the first specification in Table 4 reported in the original paper.

Research Question 3

R3: Does a decedent's location significantly affect charitable bequests?

The extant literature on probate records restricts the analysis to individual states. Thus, the generality of previous probate studies is limited if there is a significant difference in charitable bequests of decedents located in different states. Considering this potential limitation, the current study analyzes probate records from two states, Virginia and Louisiana, and examines whether there is a significant difference between them.

Table 4.14 provides a summary of the coefficients and corresponding p-values for the location dummy variable in the models presented earlier in this chapter. Overall, the results indicate that Louisiana decedents leave a significantly smaller portion of their wealth to eleemosynary organizations than Virginia decedents. There are certainly several confounding factors causing location to be significantly negative; however, this result does provide further support for prior research findings that decedents located in the South and community property states leave less to charity. As a result, future probate research can improve the generality of their results by collecting data from multiple states with geographical and property (community vs. common) law differences.

Table 4.14 Location Variable by Filing Status, Heteroscedastic Specification, and Tax Price Date Assumption

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Assumption	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
I. DOD TP	-0.2765	-0.3026	-0.4229	-0.4164	-0.2654	-0.2719
	(0.0136)	(0.0107)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
II. DOW TP	-0.3317	—	-0.5351	-0.4904	-0.2669	-0.2739
	(0.0004)		(0.0000)	(0.0000)	(0.0000)	(0.0000)
III. EDOD TP	-0.2586	0.0049	—	—	—	—
	(0.0484)	(0.8942)				
IV. Tax Regime Restriction	0.3604	—	-0.3981	-0.3462	-0.3419	-0.3400
	(0.2439)		(0.0102)	(0.0262)	(0.0031)	(0.0050)

Notes:
Parameter estimate of *ln Wealth* is multiplied by 10^6.
P-values are in parentheses.

Research Question 4

R4: What is the predicted effect of repealing the estate tax on charitable bequests under EGTRRA?

The federal estate tax is scheduled to be phased out in 2010 under EGTRRA before being reintroduced in 2011. However, there is substantial support for the permanent repeal of federal estate taxes (Slemrod 2006). Will repealing the federal estate tax have a significant impact on decedents' charitable bequests decisions? To answer this question, the predicted effects of repealing is assessed and reported in Table 4.15.

Table 4.15 Percentage Predicted Effects of Repealing the Federal Estate Tax by Filing Status, Heteroscedastic Specification and Tax Price Date Assumptions

	Filers		Non-Filers		Entire Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
Assumption	Tobit	H-Tobit	Tobit	H-Tobit	Tobit	H-Tobit
I. DOD TP	-3.4%	-12.2%	-0.2%	0.2%	-3.0%	-4.3%
II. DOW TP	-16.6%	—	-1.4%	-1.3%	-3.5%	-4.9%
III. EDOD TP	-14.2%	25.2%	—	—	—	—
IV. Tax Regime Restriction	17.2%	—	8.4%	8.7%	8.5%	3.6%

Notes:
Percentage predicted effects of repealing the federal estate tax are estimated from the H-Tobit models except for filers in the DOW or tax regime restriction samples.

The impact of adjusting the Tobit model for heteroscedasticity is highlighted by the dramatic differences in predicted changes in charitable bequests estimated from the Tobit and H-Tobit models. For instance, under the DOD assumption, repealing the federal estate tax will induce a decrease of 12.2% in the bequests from filers based on the H-Tobit estimation versus a decrease of 3.4% based on the Tobit estimation. The impact is even more pronounced under the EDOD tax price assumption as a decrease of 14.2% with the Tobit estimation changes to an increase of 25.2% with the H-Tobit estimation.

The predicted changes in charitable bequests vary under different assumptions of the tax structure. Relying on the H-Tobit result for the sample of filers assuming the DOD tax price, this study finds that repealing the federal estate tax decreases charitable bequests. The H-Tobit estimation assuming the DOD tax price is deemed to be the most reliable for several reasons. First, the federal estate tax is only applicable to decedents classified as filers. Second, the DOW assumption is not as reliable as the DOD assumption because the wills date back to the 1960's. Third, the EDOD tax prices are

more speculative than the DOD tax prices. Fourth, the sample of filers under the tax regime restriction may be too small to allow for reliable maximum likelihood estimates.

Table 4.16 compares this study's predicted effects of repealing the federal estate tax with previous research results.[36] In magnitude, the predicted effect of repealing the federal estate tax does vary across studies. However, consistent with prior research, the current study's results suggest a decrease in the charitable bequests as a result of repealing the estate tax.

Table 4.16 Comparisons of Predicted Effects of Repealing the Estate Taxes with Prior Studies

	Filers	Non-Filers	Entire Sample
Current Study	-12.2%	0.2%	-4.3%
Brunetti (2005)	-4.0%	—	—
Bennett (1990)	—	—	-59.1%
Joulfaian (2005)	-12.9%	—	—
Joulfaian (2000b)	-12.0%	—	—

Notes:
All predicted changes are estimated under the DOD assumption tax prices.
Current study's predicted changes are from the H-Tobit models.
Brunetti's (2005) predicted changes are from the model that includes both wealth and wealth squared terms and compares the predicted bequests in 2001 versus 2010.
Bennett's (1990) predicted change is from the linear model with the dollar amount of charitable bequests as the dependent variable. There are also three separate adjusted disposable wealth effects, each corresponding to estates represented by the three tax price classifications.
Joulfaian's (2005) predicted change is from the model with the dependent variable of [CB-(To-T)]/(W-To).
Joulfaian's (2000b) predicted change is from the FIML Tobit model with the dependent variable of [CB-(To-T)]/(W-To).

Summary

The Heteroscedastic Tobit (H-Tobit) model is utilized to address the violation of the homogeneity in the error distribution. The empirical findings in this chapter provide evidence that the deductibility of charitable bequests is a budget efficient tax policy.

[36] The results in Table 4.15 are from the DOD tax price assumptions because that is generally the only assumption under which predicted changes are reported by prior studies.

Furthermore, the wealth elasticity is above the unity. The results suggest that charitable bequests are significantly related to a decedent's location. Last, repealing the federal estate tax decreases charitable bequests. The following chapter includes a summary and discussion of the results of this research effort. Implications and limitations of this study are disclosed and recommendations for future research are presented.

CHAPTER 5

SUMMARY AND CONCLUSIONS

In this chapter, a summary of the previous chapters is outlined. Research findings of estate tax effects on charitable bequests are presented, followed by policy implications, limitations of the study, future research recommendations, and conclusions.

Summary of Previous Chapters

As discussed in Chapter 1, repealing the federal estate tax law has potentially harmful effects on charitable organizations that currently provide decedents with a tax-free method of distributing their wealth. Repealing the federal estate tax may also impair the federal government's ability to prudently aid eleemosynary organizations if charitable bequests' preferential tax treatment is a budget efficient policy. Therefore, an empirical investigation is needed on the budget efficiency of charitable bequest exemptions and the overall change in charitable bequests if estate taxes are repealed.

Chapter 2 includes a review of relevant prior studies that use the following data sources: federal estate tax returns or probate records. Studies of federal estate tax returns generally conclude that the estate tax with the charitable bequest exemption is a budget efficient policy. Probate research, by contrast, offers mixed results. Despite the

differences in their data, both types of studies predict that charitable bequests will decrease if the federal estate tax is repealed.

Chapter 3 describes this study's research design and methodology. Virginia and Louisiana probate records from the years 2000-2005 are examined. The study of probate records from two states has the advantage of increasing the generality of results over prior single-state probate research. The informative value of probate records is enhanced by imputing decedents' taxable estate from estate tax payment records when available. Also, this study conducts specification tests and employs the H-Tobit model, thereby improving the consistency of parameter estimates. Several assumptions regarding the tax structure (i.e., DOD, DOW, EDOD, and tax regime restriction) considered by decedents are tested to increase the robustness of the findings.

The research results are presented in Chapter 4. The results of this study suggest that an estate tax with a charitable bequest exemption is a budget efficient policy. Decedents' disposable wealth elasticity is above unity. Nonetheless, repealing the estate tax will decrease charitable bequests by approximately 12.2%. Conclusions regarding both the budget efficiency and the predicted repealing effect are substantially impacted by making necessary adjustments for heteroscedasticity. The following section summarizes the discussion of this study's four research questions.

Summary of Research Findings

The following four research questions are investigated in the current study:

1. Is the deductibility of charitable bequests a budget efficient tax policy? That is, does a 1% change in tax price lead to a larger than 1% change in charitable bequests?

2. Is the wealth elasticity above unity?

3. Does a decedent's location significantly affect charitable bequests?

4. What is the predicted effect of repealing the estate tax on charitable bequests under **EGTRRA**?

Tax price elasticities are generally negative with absolute values larger than one under several of the tax structure assumptions (i.e., DOD, DOW, and regime restriction). Although the findings of tax price elasticity hold for both filers and non-filers, non-filers are more sensitive to changes in the tax price than are filers. Therefore, the results suggest that the deductibility of charitable bequests is a budget efficient policy.

The elasticity of wealth exceeds unity under all the tax structure assumptions except the regime restriction that is associated with a relatively smaller sample. Consequently, eleemosynary organizations are expected to have a percentage change in charitable bequests greater than the percentage change in wealth. This indicates that repealing the federal estate tax may increase charitable bequests because decedents' wealth is increased if they are not paying the federal estate tax.

The generality of this study's results is enhanced by analyzing probate records from two states, Virginia and Louisiana. The amount of wealth left to charity is significantly different between the filers and non-filers of the two states. There are certainly several confounding factors inducing the significant location effect on charitable bequests; however, this result is consistent with prior research findings that decedents located in the South and community property states leave less to charity. Therefore, the current research effort suggests that future probate research can benefit from collecting data from multiple states.

Repealing the federal estate tax has conflicting results on charitable bequests. On the one hand, repealing the estate tax eliminates decedents' tax price incentive to give

their wealth to eleemosynary organizations. On the other hand, repealing the estate tax provides more wealth to decedents who are shown to leave a larger portion of their wealth to charitable organizations as their wealth increases. The current research inquiry finds that the net effect of repealing the estate tax is to decrease charitable bequests by approximately 12.2%.

Policy Implications

The findings of this study have important implications for tax policy researchers and tax policy makers. Charitable bequests represent a significant source of funding for eleemosynary organizations. In fact, postmortem charitable receipts exceeded $17.44 billion in 2005 (AAFRC 2006). Accordingly, tax policy makers have two important questions to address as they consider whether to permanently repeal estate taxes. First, is the deductibility of charitable bequests a budget efficient policy? Second, how will charitable organizations be affected in the absence of estate taxes?

Prior literature generally concludes that the deductibility of charitable bequests is a budget efficient policy. However, there are several reasons why policy makers can benefit from further analysis. First, the most recent data analyzed by probate and federal estate tax return studies are 25 and 10 years old, respectively. The significant changes in the exemption equivalent and top federal estate tax rates since the time periods examined by prior studies necessitate an updated inquiry. Second, prior probate research may suffer from a lack of generality because they are single-state analysis. Third, previous studies do not report addressing the potential violation of the errors distribution assumption. When the homogeneity assumption is violated, parameter estimates tend to

be inconsistent. Fourth, the measurement of taxable estate in previous probate research is based either on probate assets or inheritance tax valuations.

This study provides an analysis of the relationship between estate taxes and charitable bequests by examining more recent probate records from the years 2000-2005. Generality of the results is increased by assessing probate records from two states, Virginia and Louisiana. Since the assumption of homogeneous error distributions is consistently rejected, the H-Tobit model is utilized. The current research effort also imputes decedents' gross estates from reported estate tax liabilities rather than relying on probate assets as a proxy.

These aspects of the current study make its results valuable for taxpayers and tax policy makers. Specifically, the deductibility of charitable bequests remains a budget efficient tax policy even in the presence of rising equivalent exemptions and decreasing maximum estate tax rates. This conclusion holds under all tax structure assumptions except for the EDOD. Another important finding of the current inquiry is that repealing the estate tax is expected to result in a 12.2% decrease in charitable bequests.

Limitations of the Study

While the information regarding estate tax liabilities recorded in the probate records helps to improve the accuracy of the findings in this study, it is not without its limitations. First, neither Louisiana nor Virginia probate records provide information regarding decedents' religious affiliations. By contrast, both Barthold and Plotnick (1984) and Brunetti (2005) find religious affiliation to be a significant explanatory variable. Without controlling for the religious factor, the current study may suffer from model misspecification.

Second, this study's probate records do not provide information regarding when widowed decedents lost their spouse. Accordingly, it is not possible to eliminate observations that became widowed prior to the introduction of the unlimited marital deduction as suggested by Joulfaian (2005). Nevertheless, this limitation is most likely mitigated by the fact that at least 18 years have passed when a decedent became widowed before the introduction of the unlimited marital deduction. Thus, the compounding effect of the events that occurred since they became widowed probably reduces the direct impact of limited spousal bequests.

Third, although the generality of the results is increased by collecting probate records from two states, the sample still may not be representative of decedents from the entire country. Notwithstanding this limitation, two validity checks show that this study's decedents are comparable to national averages at least in size of the estate. Specifically, the average wealth of this study's decedents is similar to that of the national average in the 2004 Survey of Consumer Finances (Bucks et al. 2004). Moreover, the average gross estates of the decedents examined in this study are comparable to the 2000-2005 Statistics of Income (SOI) data from the Internal Revenue Service (IRS 2008).

Fourth, probate records do not contain potentially important behavioral information regarding decedents' history of volunteering or charitable giving during life. Fifth, the current study does not include last-dollar tax price assumptions due to the concern for a lack of an exclusion restriction. Last, although various methods are considered to address the existence of non-normality in the error distributions, no econometric techniques are employed due to the reasons detailed in Chapter 4.

Suggested Future Research

This study discloses several issues that would benefit from further analysis. Specifically, will the results be sensitive to different econometric modeling techniques such as bootstrapping? In the absence of the federal estate tax, would taxpayers begin to leave more to eleemosynary organizations during their lifetime in order to take advantage of charitable contribution tax incentives on their annual income tax returns?

Conclusions

There is considerable support for permanently repealing the federal estate tax (Slemrod 2006). However, there are two important tax policy questions that need to be addressed before deciding to repeal the estate tax. First, does the preferential tax treatment of charitable bequests stimulate more giving than the corresponding loss in tax revenue? Second, what will the net impact be on charitable bequests if estate taxes are permanently repealed? Prior literature generally concludes that the deductibility of charitable bequests is a budget efficient tax policy and repealing the estate tax would decrease charitable bequests.

The current study incorporates several methods to test the current relevance of prior research findings. Specifically, this study employs the H-Tobit model, when it is appropriate, to improve the reliability of the results; it examines the data collected under the recently increased equivalent exemptions; it examines probate records from two states to improve the generality of the results; and it utilizes a more accurate measure of taxable estate when available. With the increase in the current relevance and the reliability, this study's results suggest that the deductibility of charitable bequests is a budget efficient

policy tax policy and the repeal of the estate tax will decrease charitable bequests by 12.2%.

APPENDIX A

SAS CODE FOR SAMPLE MEANS

APPENDIX A

SAS CODE FOR SAMPLE MEANS

```
/* 1. Full sample */

data a1; set dissertb.fullsample; run;
proc means data = a1 noprint; var sordr; output out = o1 n=n  total; run;
data o1a; set o1; var = 'n_total '; mean = n_total; keep mean var; run;

/* The preceding code is adjusted as follows for alternative model specifications. First,
the filer and non-filer sample is created with the statement "if flr = 1" and "if flr = 0",
respectively.  Second, the Virginia and Louisiana sample is constructed with the
statement "if loc = 0" and "if loc = 1", respectively.*/

data a1a; set a1; if cb > 0; run;
proc means data = a1a noprint; var cb; output out = o2 n=n  cb; run;
data o3; merge o1 o2; drop _type_ _freq_; pct_cb = n_cb / n_total;
keep pct  cb; run;
data o3; set o3; var = 'pct_cb  '; mean = pct_cb; keep mean var; run;

proc means data = a1 noprint; var cb; output out = o4 mean = mean; run;
data o4; set o4; var = 'amt_cb  '; keep mean var; run;

proc means data = a1 noprint; var tpddfd; output out = o5 mean = mean; run;
data o5; set o5; var = 'tpddfd  '; keep mean var; run;

proc means data = a1 noprint; var tpdwfd; output out = o6 mean = mean; run;
data o6; set o6; var = 'tpdwfd  '; keep mean var; run;

proc means data = a1 noprint; var tpedfd; output out = o7 mean = mean; run;
data o7; set o7; var = 'tpedfd  '; keep mean var; run;

proc means data = a1 noprint; var gsestate; output out = o8 mean = mean; run;
data o8; set o8; var = 'gsestate'; keep mean var; run;

proc means data = a1 noprint; var w; output out = o9 mean = mean; run;
data  o9;  set  o9;  var  =  'wealth  ';  keep  mean  var;  run;

data a1b; set a1; if ms = 1; run;
proc means data = a1b noprint; var ms; output out = o10 n=n  ms; run;
data o11; merge o1 o10; drop _type_ _freq_; pct_ms = n_ms / n_total;
keep pct  ms; run;
data o11; set o11; var = 'pct_ms  '; mean = pct_ms; keep mean var; run;data a1c; set a1;
if gen = 1; run;
proc means data = a1c noprint; var gen; output out = o12 n=n_male; run;
```

```
data o13; merge o1 o12; drop _type_ _freq_; pct_male = n_male / n_total;
keep pct  male; run;
data o13; set o13; var = 'pct_male'; mean = pct_male; keep mean var; run;

proc means data = a1 noprint; var sc; output out = o14 mean = mean; run;
data o14; set o14; var = 'children'; keep mean var; run;

data a1d; set a1; if trst = 1; run;
proc means data = a1d noprint; var trst; output out = o15 n=n_trst; run;
data o16; merge o1 o15; drop _type_ _freq_; pct_trst = n_trst / n_total;
keep pct_trst; run;
data o16; set o16; var = 'pct_trst'; mean = pct_trst; keep mean var; run;

proc means data = a1 noprint; var pbs; output out = o17 mean = mean; run;
data o17; set o17; var = 'pct_bs  '; keep mean var; run;

proc means data = a1 noprint; var aage; output out = o18 mean = mean; run;
data o18; set o18; var = 'aage    '; keep mean var; run;

data fullsample; set o3 o4 o5 o6 o7 o8 o9 o11 o13 o14 o16 o17 o18 o1a;
mean_fullsample = mean; drop mean; run;

/* 2. Sample with charitable bequest */

data a1; set dissertb.fullsample; if cb > 0; run;
proc means data = a1 noprint; var sordr; output out = o1 n=n  total; run;
data o1a; set o1; var = 'n_total '; mean = n_total; keep mean var; run;

data a1a; set a1; if cb > 0; run;
proc means data = a1a noprint; var cb; output out = o2 n=n  cb; run;
data o3; merge o1 o2; drop _type_ _freq_; pct_cb = n_cb / n_total;
keep pct  cb; run;
data o3; set o3; var = 'pct_cb  '; mean = pct_cb; keep mean var; run;

proc means data = a1 noprint; var cb; output out = o4 mean = mean; run;
data o4; set o4; var = 'amt_cb  '; keep mean var; run;

proc means data = a1 noprint; var tpddfd; output out = o5 mean = mean; run;
data o5; set o5; var = 'tpddfd  '; keep mean var; run;

proc means data = a1 noprint; var tpdwfd; output out = o6 mean = mean; run;
data o6; set o6; var = 'tpdwfd  '; keep mean var; run;

proc means data = a1 noprint; var tpedfd; output out = o7 mean = mean; run;
data o7; set o7; var = 'tpedfd  '; keep mean var; run;
```

```
proc means data = a1 noprint; var gsestate; output out = o8 mean = mean; run;
data o8; set o8; var = 'gsestate'; keep mean var; run;

proc means data = a1 noprint; var w; output out = o9 mean = mean; run;
data o9; set o9; var = 'wealth  '; keep mean var; run;

data a1b; set a1; if ms = 1; run;
proc means data = a1b noprint; var ms; output out = o10 n=n  ms; run;
data o11; merge o1 o10; drop _type_ _freq_; pct_ms = n_ms / n_total;
keep pct  ms; run;
data o11; set o11; var = 'pct_ms  '; mean = pct_ms; keep mean var; run;

data a1c; set a1; if gen = 1; run;
proc means data = a1c noprint; var gen; output out = o12 n=n_male; run;
data o13; merge o1 o12; drop _type_ _freq_; pct_male = n_male / n_total;
keep pct  male; run;
data o13; set o13; var = 'pct_male'; mean = pct_male; keep mean var; run;

proc means data = a1 noprint; var sc; output out = o14 mean = mean; run;
data o14; set o14; var = 'children'; keep mean var; run;

data a1d; set a1; if trst = 1; run;
proc means data = a1d noprint; var trst; output out = o15 n=n  trst; run;
data o16; merge o1 o15; drop _type_ _freq_; pct_trst = n_trst / n_total;
keep pct  trst; run;
data o16; set o16; var = 'pct_trst'; mean = pct_trst; keep mean var; run;

proc means data = a1 noprint; var pbs; output out = o17 mean = mean; run;
data o17; set o17; var = 'pct_bs  '; keep mean var; run;

proc means data = a1 noprint; var aage; output out = o18 mean = mean; run;
data o18; set o18; var = 'aage    '; keep mean var; run;

data wcb; set o3 o4 o5 o6 o7 o8 o9 o11 o13 o14 o16 o17 o18 o1a;
mean_wcb = mean; drop mean; run;

/* 3. Sample without charitable bequest */

data a1; set dissertb.fullsample; if cb = 0; run;
proc means data = a1 noprint; var sordr; output out = o1 n=n  total; run;
data o1a; set o1; var = 'n_total '; mean = n_total; keep mean var; run;

data a1a; set a1; if cb > 0; run;
proc means data = a1a noprint; var cb; output out = o2 n=n  cb; run;
data o3; merge o1 o2; drop _type_ _freq_; pct_cb = n_cb / n_total;
keep pct_cb; run;
```

```
data o3; set o3; var = 'pct_cb  '; mean = pct_cb; keep mean var; run;

proc means data = a1 noprint; var cb; output out = o4 mean = mean; run;
data o4; set o4; var = 'amt_cb  '; keep mean var; run;

proc means data = a1 noprint; var tpddfd; output out = o5 mean = mean; run;
data o5; set o5; var = 'tpddfd  '; keep mean var; run;

proc means data = a1 noprint; var tpdwfd; output out = o6 mean = mean; run;
data o6; set o6; var = 'tpdwfd  '; keep mean var; run;

proc means data = a1 noprint; var tpedfd; output out = o7 mean = mean; run;
data o7; set o7; var = 'tpedfd  '; keep mean var; run;

proc means data = a1 noprint; var gsestate; output out = o8 mean = mean; run;
data o8; set o8; var = 'gsestate'; keep mean var; run;

proc means data = a1 noprint; var w; output out = o9 mean = mean; run;
data o9; set o9; var = 'wealth  '; keep mean var; run;

data a1b; set a1; if ms = 1; run;
proc means data = a1b noprint; var ms; output out = o10 n=n  ms; run;
data o11; merge o1 o10; drop _type_ _freq_; pct_ms = n_ms / n_total;
keep pct  ms; run;
data o11; set o11; var = 'pct_ms  '; mean = pct_ms; keep mean var; run;

data a1c; set a1; if gen = 1; run;
proc means data = a1c noprint; var gen; output out = o12 n=n  male; run;
data o13; merge o1 o12; drop _type_ _freq_; pct_male = n_male / n_total;
keep pct  male; run;
data o13; set o13; var = 'pct_male'; mean = pct_male; keep mean var; run;

proc means data = a1 noprint; var sc; output out = o14 mean = mean; run;
data o14; set o14; var = 'children'; keep mean var; run;

data a1d; set a1; if trst = 1; run;
proc means data = a1d noprint; var trst; output out = o15 n=n  trst; run;
data o16; merge o1 o15; drop _type_ _freq_; pct_trst = n_trst / n_total;
keep pct  trst; run;
data o16; set o16; var = 'pct_trst'; mean = pct_trst; keep mean var; run;

proc means data = a1 noprint; var pbs; output out = o17 mean = mean; run;
data o17; set o17; var = 'pct_bs  '; keep mean var; run;

proc means data = a1 noprint; var aage; output out = o18 mean = mean; run;
data o18; set o18; var = 'aage    '; keep mean var; run;
```

```
data wtcb; set o3 o4 o5 o6 o7 o8 o9 o11 o13 o14 o16 o17 o18 o1a;
mean_wtcb = mean; drop mean; run;

data table4_1; merge fullsample wcb wtcb; run;
```

APPENDIX B

SAS CODE FOR TOBIT REGRESSION

APPENDIX B

SAS CODE FOR TOBIT REGRESSION

data a1; set dissertb.fullsample; wdd1 = wdd/**1000000**; w1 = w/**1000000**;
ln tpddfd = log(tpddfd); ln_tpddld = log(tpddld); ln_wdd1 = log(wdd1); ln_w1 = log(w1); **run**;

/* The preceding code is modified as follows in regards to the different date of tax price assumptions. For the date of will and expected date of death tax price assumption, tpdwfd and tpedfd are used, respectively, rather than tpddfd.

The following code is used to construct the tax regime sample.

```
data a1a; set dissertb.fullsample;
if yd = 2000 or yd = 2001 then taxregime = 1;
if yd = 2002 or yd = 2003 then taxregime = 2;
if yd = 2004 or yd = 2005 then taxregime = 3; run;
data a1b; set a1a; if taxregime = 1; if yw = 2000 or yw = 2001; run;
data a1c; set a1a; if taxregime = 2; if yw = 2002 or yw = 2003; run;
data a1d; set a1a; if taxregime = 3; if yw = 2004 or yw = 2005; run;
data a1e; set a1b a1c a1d; run;
data a1; set a1e;
```

The remaining code is the same for the filers and non-filer subsamples with the following exceptions. First, the preceding line of code contains the statement "if flr = 1" and "if flr = 0" for the filer and non-filer samples, respectively. Second, the matrices defined in the Lagrange Multiplier tests are adjusted to reflect the different sample sizes. */

/* 1. Tobit Regression */

proc qlim data = a1;
model bsacbdd = ln_tpddfd ln_wdd1 loc pbs sc age gen trst ms;
endogenous bsacbdd ~ censored (lb=**0** ub=**1**);
output out = a2 residual xbeta expected;
title 'Standard Tobit (all)';
run;
ods listing close;
proc qlim data = a1;
ods output ParameterEstimates = Params;
model bsacbdd = ln tpddfd ln wdd1 loc pbs sc age gen trst ms;
endogenous bsacbdd ~ censored (lb=0 ub=**1**);
run;
ods listing;
/**/ **data** Params tobit; set Params; model = 'tobit standard '; **run**;
data Params1; set Params; if parameter = '_Sigma'; sigma = estimate; i = **888**;
keep sigma i; **run**;

data a2; set a2; i = **888**; **run**;

```
data a3; merge a2 Params1; by i; xbeta_sigma = xbeta_bsacbdd / sigma;
pdf_xbetasigma = pdf('NORMAL',xbeta_sigma);
cdf_xbetasigma = cdf('NORMAL',xbeta_sigma); run;

 /* 2. Price & Wealth Elasticities */

 /* params -- parameters of ln_tpddfd & ln_weath*/
data Paramsp; set Params; if parameter = 'ln_tpddfd'; lntp_beta = estimate; i = 888;
keep lntp_beta i; run;
data Paramsw; set Params; if parameter = 'ln_wdd1'; lnwdd1_beta = estimate; i = 888;
keep lnwdd1_beta i; run;

 /* calculate z and cdf(z) */
data e1; set a3; z = xbeta_sigma; run;
proc means data = e1 noprint; var z; output out = e2 mean = mean_z; run;
data e2; set e2; drop _type_ _freq_; cdfz = cdf('NORMAL',mean_z); i = 888; run;
 /* calculate mean of bsacbdd */
proc means data = a3 noprint; var bsacbdd; output out = e3 mean = mean_bsacbdd; run;
data e3; set e3; drop _type_ _freq_; i = 888; run;
 /* calculate price elasticity & wealth elasticity */
data e4; merge e2 e3 Paramsp Paramsw; by i; drop i; run;
data e5; set e4; pe = cdfz * lntp_beta * (1 / mean_bsacbdd) - 1;
we = cdfz * lnwdd1_beta * (1 / mean_bsacbdd) + 1; run;
data elasticity_tobit; set e5; model = 'tobit_standard '; keep pe we model; run;

 /* 3. EGTRRA Prediction */

 /* parameters of control variables */
data Paramsz; set Params;
if parameter = 'LOC' or parameter = 'PBS'
or parameter = 'SC' or parameter = 'AGE'
or parameter = 'GEN' or parameter = 'TRST'
or parameter = 'MS'; keep parameter estimate; run;
proc transpose data = Paramsz out = Paramsz_2; run;
data Paramsz_3; set Paramsz_2; loc_beta = col1; pbs_beta = col2;
sc_beta = col3; age_beta = col4; gen_beta = col5; trst_beta = col6;
ms_beta = col7; i = 888; drop _name_ col1 -- col7; run;

data a4; merge a3 Paramsz_3 Paramsw; by i; run;
data a5; set a4; est_z = loc_beta*loc + pbs_beta*pbs + sc_beta*sc + age_beta*age
+ gen_beta*gen + trst_beta*trst + ms_beta*ms;
est_lnw1 = lnwdd1_beta * ln_w1;
cb1 = (wdd1*(cdf_xbetasigma*xbeta_bsacbdd + pdf_xbetasigma*sigma))/tpddfd;
cb2 = w1*(cdf_xbetasigma*(est_lnw1 + est_z) + pdf_xbetasigma*sigma); run;
proc means data = a5 noprint; var cb1; output out = ocb1 mean = cb1_mean; run;
proc means data = a5 noprint; var cb2; output out = ocb2 mean = cb2_mean; run;
```

```
data ocb  tobit; merge ocb1 ocb2; drop  type    freq  ;
diffcb2cb1 = cb2  mean - cb1  mean; pctcb2cb1 = 100 * (diffcb2cb1 / cb1_mean);
model = 'tobit_standard  '; run;

 /* 4. Lagrange Multiplier (Heteroscedasticity & Nonnormality) */

 /* define zi -- zi = 1 if 0 < yi < 1; zi = 0 if yi <= 0 or yi >= 1 */
data a6; set a3; if 0 < bsacbdd < 1 then zi = 1;
if bsacbdd le 0 then zi = 0; if bsacbdd ge 1 then zi = 0; run;
 /* calculate epsilon */
data a7; set a6; epsilon = bsacbdd - xbeta_bsacbdd; run;
 /* calculate Lambda */
data a8; set a7; phi1 = pdf_xbetasigma; phi2 = 1 - cdf_xbetasigma;
Lambda = phi1/phi2; run;
 /* calculate ai and bi */
data a9; set a8; sigmasq = sigma**2; sigmacub = sigma**3; epsilonsq = epsilon**2;
a = zi * (epsilon/sigmasq) - (1-zi) * (Lambda/sigma);
b = zi * ((epsilonsq/sigmasq - 1)/(2*sigmasq)) + (1-zi) *
((xbeta  bsacbdd*Lambda)/(2*sigmacub));
drop sigmasq sigmacub epsilonsq; run;

 /* calculate the data vector gi = [ai*xi', bi]' */
data a10; set a9; a_lntpddfd = a * ln_tpddfd; a_lnwdd1 = a * ln_wdd1; a_loc = a * loc;
a  pbs = a * pbs; a  sc = a * sc; a_age = a * age; a_gen = a * gen; a_trst = a * trst;
a  ms = a * ms; run;
data a11; set a10; b1 = b; drop b; run;
data a12; set a11; b = b1; drop b1;
keep a_lntpddfd a_lnwdd1 a_loc a_pbs a_sc a_age a_gen a_trst a_ms b; run;

 /* LM test on Nonnormality:
    create the matrix M = [ei^3, ei^4 - 3*(ei^4)]' -- where ei is equivalent to ai */
data a13; set a9; m1 = a**3; m2 = a**4 - 3*(a**4); keep m1 m2; run;

data a14; merge a12 a13; run;

proc iml;
use a14;
read all var { a_lntpddfd a_lnwdd1 a_loc a_pbs a_sc a_age a_gen a_trst a_ms b } into G;
/* print "The matrix G (900x10) is",
        G; */
read all var { m1 m2 } into M;
/* print "The matrix M (900x2) is",
        M; */
reset noprint;
```

```
                one = j(900,1,1);
                    GTGGITG = G * inv(G` * G) * G`;
                    D = M * inv(M` * M - M` * GTGGITG * M) * M`;
reset print;
        LM  hetero = one` * GTGGITG * one;
        pvalue = pdf('CHISQ',LM_hetero,1);
        LM  norm = one` * D * one;
        pvalue = pdf('CHISQ',LM_norm,2);
title 'Tobit_all LM';
quit;
```

APPENDIX C

SAS CODE FOR H-TOBIT REGRESSION

APPENDIX C

SAS CODE FOR H-TOBIT REGRESSION

data a1; set dissertb.fullsample; wdd1 = wdd/**1000000**; w1 = w/**1000000**;
ln tpddfd = log(tpddfd); ln_tpddld = log(tpddld); ln_wdd1 = log(wdd1); ln_w1 = log(w1); **run**;

/* The preceding code is modified as follows in regards to the different date of tax price assumptions. For the date of will and expected date of death tax price assumption, tpdwfd and tpedfd are used, respectively, rather than tpddfd.

The following code is used to construct the tax regime sample.

```
data a1a; set dissertb.fullsample;
if yd = 2000 or yd = 2001 then taxregime = 1;
if yd = 2002 or yd = 2003 then taxregime = 2;
if yd = 2004 or yd = 2005 then taxregime = 3; run;
data a1b; set a1a; if taxregime = 1; if yw = 2000 or yw = 2001; run;
data a1c; set a1a; if taxregime = 2; if yw = 2002 or yw = 2003; run;
data a1d; set a1a; if taxregime = 3; if yw = 2004 or yw = 2005; run;
data a1e; set a1b a1c a1d; run;
data a1; set a1e;
```

The remaining code is the same for the filers and non-filer subsamples with the following exceptions. First, the preceding line of code contains the statement "if flr = 1" and "if flr = 0" for the filer and non-filer samples, respectively. Second, the matrices defined in the Lagrange Multiplier tests are adjusted to reflect the different sample sizes. */

/* 1. Tobit Regression with Heteroskedasticity */

proc qlim data = a1;
model bsacbdd = ln_tpddfd ln_wdd1 loc pbs sc age gen trst ms;
endogenous bsacbdd ~ censored (lb=**0** ub=**1**);
hetero bsacbdd ~ sc trst / link = exp noconst;
output out = a2 residual xbeta expected;
title 'Tobit with Heteroskedasticity (all)';
run;
ods listing close;
proc qlim data = a1;
ods output ParameterEstimates = Params;
model bsacbdd = ln tpddfd ln wdd1 loc pbs sc age gen trst ms;
endogenous bsacbdd ~ censored (lb=**0** ub=**1**);
hetero bsacbdd ~ sc trst / link = exp noconst;
run;
ods listing;
data Params1; set Params; if parameter = '_Sigma'; sigma = estimate; i = **888**;
keep sigma i; **run**;
/**/ **data** Params_tobith; set Params; model = 'tobit_hetero '; **run**;

```
data a2; set a2; i = 888; run;
data a3; merge a2 Params1; by i; xbeta_sigma = xbeta_bsacbdd / sigma;
pdf_xbetasigma = pdf('NORMAL',xbeta_sigma);
cdf_xbetasigma = cdf('NORMAL',xbeta_sigma); run;

 /* 2. Price & Wealth Elasticities */

 /* params – parameters of ln_tpddfd & ln_wealth*/
data Paramsp; set Params; if parameter = 'ln_tpddfd'; lntp_beta = estimate; i = 888;
keep lntp_beta i; run;
data Paramsw; set Params; if parameter = 'ln_wdd1'; lnwdd1_beta = estimate; i = 888;
keep lnwdd1_beta i; run;

 /* calculate z and cdf(z) */
data e1; set a3; z = xbeta_sigma; run;
proc means data = e1 noprint; var z; output out = e2 mean = mean_z; run;
data e2; set e2; drop _type_ _freq_; cdfz = cdf('NORMAL',mean_z); i = 888; run;
 /* calculate mean of bsacbdd */
proc means data = a3 noprint; var bsacbdd; output out = e3 mean = mean_bsacbdd; run;
data e3; set e3; drop _type_ _freq_; i = 888; run;
 /* calculate price elasticity & wealth elasticity */
data e4; merge e2 e3 Paramsp Paramsw; by i; drop i; run;
data e5; set e4; pe = cdfz * lntp_beta * (1 / mean_bsacbdd) - 1;
we = cdfz * lnwdd1_beta * (1 / mean_bsacbdd) + 1; run;
data elasticity_tobith; set e5; model = 'tobit_hetero   '; keep pe we model; run;

 /* 3. EGTRRA Prediction */

 /* parameters of control variables */
data Paramsz; set Params;
if parameter = 'LOC' or parameter = 'PBS'
or parameter = 'SC' or parameter = 'AGE'
or parameter = 'GEN' or parameter = 'TRST'
or parameter = 'MS'; keep parameter estimate; run;
proc transpose data = Paramsz out = Paramsz_2; run;
data Paramsz_3; set Paramsz_2; loc_beta = col1; pbs_beta = col2;
sc_beta = col3; age_beta = col4; gen_beta = col5; trst_beta = col6;
ms_beta = col7; i = 888; drop _name_ col1 -- col7; run;

data a4; merge a3 Paramsz_3 Paramsw; by i; run;
data a5; set a4; est_z = loc_beta*loc + pbs_beta*pbs + sc_beta*sc + age_beta*age
+ gen_beta*gen + trst_beta*trst + ms_beta*ms;
est_lnw1 = lnwdd1_beta * ln_w1;
cb1 = (wdd1*(cdf_xbetasigma*xbeta_bsacbdd + pdf_xbetasigma*sigma))/tpddfd;
cb2 = w1*(cdf_xbetasigma*(est_lnw1 + est_z) + pdf_xbetasigma*sigma); run;
proc means data = a5 noprint; var cb1; output out = ocb1 mean = cb1_mean; run;
```

```
proc means data = a5 noprint; var cb2; output out = ocb2 mean = cb2_mean; run;
data ocb  tobith; merge ocb1 ocb2; drop   type     freq  ;
diffcb2cb1 = cb2  mean - cb1 _mean; pctcb2cb1 = 100 * (diffcb2cb1 / cb1_mean);
model = 'tobit_hetero    '; run;
```

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