

A COMPARATIVE ANALYSIS OF INDUSTRIAL TIMBERLAND PROPERTY

TAXATION IN THE US SOUTH

by

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(Under the Direction of David H. Newman)

ABSTRACT

The Fair Market Value and property tax burden of industrial timberland in five southern states: Alabama, Georgia, Mississippi, North Carolina and South Carolina are compared. It is found that not only the Fair Market Value of timberland is the highest but also the tax burden is highest in the state of Georgia. Examining the factors leading to the high tax burden in Georgia with the analysis of some SAS models shows that location, population growth rate and Conservation Use Valuation Assessments usage are good predictors of land value. Several factors expected to be significant are shown to be insignificant in predicting timberland value. Further research is needed to prove if they are really insignificant. GIS maps are also used to illustrate the comparison of Fair Market Value and tax burden between the five states and draw a conclusion of the situation the states of Georgia is faced.

INDEX WORDS: Industrial Timberland, Property Taxation, Fair Market Value,  
Conservation Use Valuation Assessment

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## CHAPTER 1 INTRODUCTION

### Part A. Timberland Property Taxation

Although the property tax is not the sole support of state-local governments in the United States, it remains the single most important factor in state-local finance. The property tax is the primary source of revenue for local counties and schools in many states and a major source of revenue for cities. With ever increasing demands for infrastructure, economic development and service delivery, local governments must rely more heavily on property tax revenue. Even though local option and special purpose sales taxes have been important sources of local revenue, these taxes are sometimes unreliable due to fluctuations in the economy (Dangerfield et. al 2001). In major timber-producing states, the property taxation on timberland plays particularly important role in the stabilization of local revenues.

The property tax on timberland is generally an *ad valorem* tax with the amount levied against a particular piece of timberland based on its value. A comparable value must therefore be determined for every piece of taxable land. This assessed or taxable value is generally based on the “fair market value” (FMV), but may be adjusted by an assessment ratio, which reduces the market value by some factor or percentage. The concept of fair market value is commonly understood to represent the price the property would bring at a fair, voluntary sale. In other words, the value at which the property

would change hands between a willing buyer and a willing seller, neither being under any obligation to buy or sell and both having reasonable knowledge of relevant facts.

The formula for tax paid is as below:

$$\text{Tax Paid} = \text{Assessed Value} \times \text{Millage Rate}$$

$$\text{Assessed Value} = \text{FMV(Appraisal Value)} \times \text{Assessment Percentage}$$

The annual tax on the timberland is generally a tax on the land, the timber that grows on that piece of land is exempt in most of the states. When timber is harvested, most of the time it will be taxed, through the use of a yield tax or severance tax.

#### Part B. Problems and Justification

Timberland property taxation system differs across states, and even between counties in the same state. In each state, the tax treatment of industrial timberland varies also. As a result of the different taxation schemes, the tax burden on the landowners in each state varies. Variations in rates can be extreme, in the tax year of 2000, the average tax per acre on the timberland in the state of Alabama was \$1.70/acre while in the state of Georgia it was as high as \$4.85/acre, with \$2.16 in the state of South Carolina, \$2.84 in North Carolina and \$3.08 in Mississippi.

Property taxes are a discriminating factor in forest production decisions between Georgia and neighboring southern states (Alabama, Mississippi, North Carolina, and South Carolina), since federal taxes are the same throughout and the state income tax is relatively minor (Dangerfield et al. 2001). Thus the perceived high tax burden on

timber landowners in Georgia could put the state at a competitive disadvantage. When the companies cannot afford a high tax burden, they may move their production to a place where the cost of investment is relatively lower. So it is necessary to dig deeper for the factors that drive the tax burden so high in the state of Georgia.

As a factor that influences the tax paid, millage rates can be important in some counties, but according to Dangerfield et. al's (2001) research, there has been an overall decline in Georgia's millage rates, by 4.28% from 1995 to 1999. On the other hand, the other deciding factor of tax burden, the assessed value, has increased significantly since 1990. The rising of the assessed values is the result of the total or partial revaluations and updates to properties in the counties to conform to the state standards for acceptable digests. The state digest increased from \$131.7 billion in 1993, to \$187.0 billion in 2000, a 42% increase over the seven-year period. County assessed values reached a high of \$187.0 billion in 1999, an 8.85% increase from the values reported in 1998. These increases in the valuation have become a major concern of property owners and have created an increased tax burden for these property owners.

With increasing urban sprawl in Georgia, FMV has kept on increasing. It is claimed that this is unfair for the lands devoted to agricultural and forestry uses, since the sales of property for development purposes in an area may inflate the value of these lands. Sometimes the tax based on the FMV is so high that it exceeds the support level of landowners, especially farming or forestry landowners. When the tax is unaffordable, the only choice for property owners will be to sell their land. Thus urban sprawl is actually encouraged rather than controlled by higher taxes.

Property taxation is well known to be a major factor in land use decisions. Of ongoing concern is the belief that taxation at FMV fosters the transition of farming and forestland into suburban development (Coughlin et al. 1978). This is because as suburban fringe land becomes worth more in development than in its current use, the higher property taxes associated with FMV may force landowners to sell.

To help reduce this tax pressure, the state of Georgia introduced two different taxation schemes in the 1980s and 1990s, the Conservation Use Valuation Assessment (CUVA) and Agricultural Preferential Assessment (APA). The purposes of these two programs were to control urban sprawl, land use transition and the resulting environmental impacts from these changes and to provide tax relief for a broad class of property owners. Though the CUVA and APA policies can substantially reduce a landowner's tax liability, these programs have a number of qualifications. Two of the most important are that a maximum of 2,000 acres can be enrolled and that industrial corporate landowners are ineligible.

This discrimination against industrial timberland owners places Georgia forestry in a peculiar position. The state maintains a world-class forestry sector, which contributes over \$20 billion a year to the state economy and provides myriad environmental and aesthetic benefits to the public. However, it is pursuing a tax policy that actively discourages the continued development and management of the forest resource base on which the sector depends. This policy has placed the entire sector at a potentially serious competitive disadvantage relative to other states and countries.

The effect that this policy has on large timberland owners will be manifested in declining forest investment in the future. Already, industrial timberland ownership is

declining (the latest Forest Service survey showed industrial ownership declining by 17% in the last decade), and this will likely continue as alternative land ownership structures develop. Although, this isn't just property tax driven.

In the state of Georgia, the average tax on industrial timberland varies between counties, ranging from \$1.43 to \$25.84 in 2001. Generally speaking, the tax burden will be higher on timberland located in the north and northcentral part of the state than the tracts located in the south, especially the southeast. Thus, since company land is often regionally concentrated, there is substantial variation between companies. The average per acre tax variation ranges from \$3.08 to \$12.54 per acre. Companies with higher tax burdens generally own their timberlands located in the northern part of the state, so once again, location is a driving factor influencing the tax paid.

### Part C. Background and Objectives

In the property category, forestland is unique due to its particular position in the social, political and economic world, and its physical characteristics. An undeveloped park in an urbanized area may look very much like the forested portion of a suburban estate, and both may resemble extensive forested areas in the sparsely inhabited hinterland. But the benefits these forestlands can produce are quite different because of their location and the specific social, economic, legal and political forces with which they are associated. Their value, which is assumed to derive from the land's capacity to produce timber, also makes forestlands different. However, changes in our economy and society are working to obscure any absolute differences between rural and urban

life. The opposing forces of diffusion from and polarization toward urban centers make it difficult to generalize about “city” and “country”. Forested land is caught up in this process and timber-growing productivity has ceased to be a valid measure of property value in many places.

Valuation, equity, and non-revenue effects create problems in taxing any kind of property. Since forestland is such a different kind of property, the effects on forestland become even more serious. The most significant peculiarity is that the nature of forestland as property is not determined solely by the fact that it has forest vegetation growing on it (Copper and Warrell, 1971). Thus, policies that adversely affect timber investment decisions today may take decades to affect rates of timber harvest or the final economics of investing in timber production.

Property tax policy underwent enormous changes from the 1960’s to the 1990’s. These changes coupled with the changing character of the forest resource, as well as changes in national and global markets, have produced a much more difficult economic environment for industrial and nonindustrial landowners alike.

Landowners, foresters, tax administrators, legislators, and others have debated about the property tax systems applied to forest for decades, without any agreement. This seems understandable, because the systems themselves are constantly changing, and furthermore the levels of taxation and administration vary widely from one state to another, and even from one county to another. Due to differences in tax laws, state constitutions, forestry practices and forests themselves, it is difficult for one to prescribe a broad, general solution to forest land taxes.



While a number of regulatory and market-based preservation techniques have been promulgated in an attempt to limit the land use change, perhaps the most common policy used to try and slow transition is differential property taxation (Roberts and Brown 1980; Nelson 1990).

No matter whether it's called "preferential" or "differential" property taxation, its basis is generally the same, the use-value assessment. The subject of use-value farmland assessments has become one of the most talked-about, important, and intriguing in the field of property taxation today. Use-value assessment is the assessment of property upon the basis of its value in a particular (current) use, rather than upon the basis of its market value (International Association of Assessing Officers 1974). The current use value assessment is imported to forest taxation with the attempt to solve the property tax valuation problem on these lands. This concept has spread out as population and reappraisal pressures grow. It was welcomed by many states and has been widely legislated.

Though widely employed, the actual impact of this preferential property tax system on forest management varies widely. According to Chang's (1980) study, "Northeastern states, in particular, report that use-value programs have resulted in more intensive management of private forest lands and better employment opportunities for private consulting foresters. Southern and western states report that though the property tax burden on forest landowners has decreased significantly, there has been little effect on forest management."

All in all, all the former arguments and debates about the taxation policy systems in the forestlands are about the "policy", there are few empirical studies in this

area. Even few comparative studies have been done, although every county's and state's tax is reported each year. Our research attempts to fill this void.

We come into this study with the following objectives:

1. To conduct a comparative analysis of industrial timberland property tax across the counties in the same state, as well as across the five southern states (Alabama, Georgia, Mississippi, North Carolina, South Carolina).

2. To determine the major factors that influence land valuation and tax burden of the landowners.

3. To model the influence of these factors on the land valuation and tax burden.

In general, our objective is to help develop tax policies that encourage the productive use of Georgia's forestland, offer a reasonably stable and adequate base for local taxation, and are more evenhanded in their treatment of various land owners.

#### Part D. Organization

To solve the above problems appropriately, we provide a thorough review of the taxation history on the forestlands. Since forestland is a particular kind of property, the taxation history of the general property is reviewed. The debates, arguments and reforms related to property taxation follow. Our main focus is on the taxation of forestland, so earlier research, arguments, debates, and reforms in this area will be reviewed.

Since there are numerous differences between the taxation policies applied in each state, a description and comparison of the policies is necessary. Thus, Chapter 3 is devoted to a review tax policies for each state in our study. The main resources for this chapter are the individual state's tax codes. Chapter 4 provides the methodology used in the study. It includes the data description, data analysis, and model design. The analytical and statistical results are analyzed and discussed in Chapter 5. The thesis will conclude with major findings of the analysis and some policy implications in Chapter 6.

## **CHAPTER 2 LITERATURE REVIEW**

### Part A. Property Taxation and its Development in the United States

Property taxation in American is the principal fiscal resource of local governments. It is also known as the ad valorem taxation of property since the amount levied against a particular property is based on its value. The United States is the citadel of capitalism; yet this tax on wealth is more important in the fiscal system and relative to national income than are comparable taxes in any other advanced country in the world except Canada (Netzer 1966). Nowadays, although property taxation is no longer the sole support of state-local government, as it was at the turn of the twentieth century, it continues to be the single most important finance resource for the civilian general expenditures of federal, state, and local governments. School district, county governments, and townships each receive virtually all their tax revenue and most of locally raised funds from the property tax. With ever increasing demands for infrastructure, economic development and service delivery, local governments must rely more heavily on property tax revenue. Even though local option and special purpose sales taxes have been important sources of local revenue, these taxes are sometimes unreliable due to fluctuations in the economy (Dangerfield et al. 2001).

For the past hundred years or more, property taxation has been assailed with critics. Criticism of the property tax is a perennial feature of discussion about American

fiscal policy. “The property tax abounds in anomalies. During the past century, no major fiscal institution, here or abroad, has been criticized at such length and with such vigor; yet no major fiscal institution has changed so little in modern times,” said Netzer (1966). He also summarized the waves of criticism associated with the changing fortunes of the property tax during the time before the 1960’s: savage across-the-board attacks in the late nineteenth century; a somewhat more moderate tone and a quest for ways to make the institution work more effectively in the 1920’s; renewed broadsides in the 1930’s; and what can be best described as a “new complacency” regarding the property tax in the 1950’s. Jensen (1931) said so well about the criticism with the property taxes: “If any tax could have been eliminated by adverse criticism, the general property tax should have been eliminated long ago. One searches in vain for one of its friends to defend it intelligently... Yet the notorious property tax persists.”

The controversies that concern property tax generally allege that it is regressive and inequitably administered. Many economists consider the property tax to be regressive, since it is observed that families with low incomes have to pay a larger portion of their incomes in property taxes than do families with high incomes. This had been generally accepted throughout the twentieth century. The regressivity - the supposed tendency of the proportion of income paid out in property taxes to decline as income rises, is viewed as the number one evils that have been attributed to property taxes by Harris (1982) in his discussion of the virtues of the property tax.

But most of the shortcomings of the property taxes are associated with administration mechanism. As to the administration of the property taxation, Netzer (Dec.1966) states: “The conventional wisdom, perhaps, is that the property tax is

inherently a sound tax, properly utilized as the number one revenue source for non-federal government, but that it is all too often administered badly. My view is that the quality of administration of the property tax is universally worse than the quality of administration we have come to expect in connection with income and sales taxes. In some jurisdictions, the quality of property tax administration is only moderately worse than the quality of good nonproperty tax administration; in others, it is abysmally worse. But nowhere does it really match nonproperty tax administration.”

Property taxes vary widely across the United States. For example, in 1972, 65,914 different governments had authority to impose them, with some kind of overlap in intricate patterns. Furthermore, all states allow subsidiary governments to set different rates and tolerate considerable local discretion in making rules and in administering nominally similar laws. Aaron (1975) enumerated the factors that contribute to the unneatness of the practice of the property taxation. First, many states exempt some real property from taxation owned by governments, and by religious, nonprofit, philanthropic, or educational organizations, and the breadth of these exemptions varies. Some of real property exempted in one jurisdiction may be taxed in another. Second, the effort to tax business property other than land and structures differs widely. An increasing number of states exempt part or all of business inventories. Third, the market value of property used by railroads and other utilities, banks, and mines is particularly hard to assess. Taxes on these properties are handled differently in various states and are often calculated by methods different from those applied to other real property. Fourth, the coverage of personal tangible and intangible property differs widely among the states. Finally, tax rates also vary widely. Beyond all

this, the procedures used in assessing property and the efficiency with which they are applied differs widely, so that the accuracy of appraisal is uneven. Thus, the ratio of tax to market value varies widely across and within jurisdiction.

Additionally, unlike the sales taxes and income taxes, the property taxes are levied based on an assessed value, not on value reported in actual sales. And this assessed value is not so easy to get - any fool can count the number of sheep going over a fence, but it takes an expert to evaluate the flock, and different experts might come up with different figures. Property liabilities change only after an assessor changes his estimate of taxable value, a process that may occur virtually instantly or only after decades. Furthermore, most real property is not sold every year, but market values continually change. Thus it is difficult to define fairness and equity in the administration of the property tax, let alone apply them. But as Harold Groves (1969) said, “the trend of recent history gives some warrant for optimism. If we make as much progress improving property tax administration in the next sixty-five years as we did in the last, we could be well along the road toward acceptable standards of excellence.”

Nearly everyone professes to be an expert on property taxation, and a number of these experts have written books and articles suggesting how it can be reformed. It is significant to note that most of these books and articles use the word “reform” and not the word “abolish” (Corusy, 1967).

Popular discontent with the distribution of property tax liabilities has led to a wide variety of reform programs, among which are special tax relief, rebates, and alteration of the tax base. Most states provide homestead exemptions, exemptions for senior citizens, or “circuit breaker” relief against property tax liabilities. Almost from

the beginning, there have been moves to narrow the tax base by exempting specific properties, by excluding certain forms of property, or by restricting it to land (Aaron 1975). At the same time, outmoded and sometimes unworkable property tax laws are found in most states, and have been changed the various state legislative sessions emphasizing the problem of equity by providing various types of property tax relief (Corusy 1967).

Property taxation in America has advanced both with the climate of public opinion and with the level of economic development but on the whole has tended to resist changes. “There is every indication, however, that it will adjust more rapidly to the demands of today and tomorrow. This striking changes during the past twenty-five or thirty years alone and the accelerated pace with which they have been occurring would seem to indicate that this ancient tax has entered a truly revolutionary era (Back 1967).”

“Property taxation in the United States can be substantially improved. The structure can be changed so that the adverse nonrevenue effects will be lessened without reducing revenue. The method? Reducing rates on buildings and other man-made capital and getting more revenue from land (Harriss 1999).”

Vickrey (1999) claimed that economically speaking, the property tax is a combination of one of the worst taxes and one of the best taxes. The worst part is that it is assessed on real estate improvements and in some cases to a limited extent on personality, while the best part is the tax on land or site value. He suggested that the shifting from a property tax to a land-value tax could result in a vast improvement in city finances. This result is based on his theory that a tax on land, properly assessed



independently of the use made of the lot, is virtually free of distortionary effects and “excess burden.”

Since Henry Georgia advocated it in 1879, land taxation has enjoyed support for two independent reasons. While many Georgists have argued that the levying of a heavy tax on land values would force landlords to bring idle land up to its “highest and best use” in order to finance the payment of the tax, mainstream economists have emphasized the role of the tax in substituting for various taxes having serious distortionary effects, a tax that comes in a lump sum (Vickrey 1999). “Economists have favored land taxation as perhaps the only practical major tax available that does not distort economic decisions. A land tax would not fall on improvements, and unlike the conventional real property tax, it would not deter any investment whose gross returns exceed costs (Aaron 1975).” In summary, a shift to land taxation would cause widespread redistributions of taxes and land values to achieve a goal that can be reached with fewer distortions. Thus the land taxation has been widely adopted and approached over the years.

#### Part B. Preferential Property Taxation in the United States

In the 1950’s and 1960’s, fundamental changes in the nature of the property tax system overwhelmed in the United States. Besides the increasing popularity of taxing different sorts of property by different tax rates and the widespread introduction of “circuit breaker” legislation designed for elderly and low-income homeowners,

preferential property treatment of agricultural and open space lands has become essentially universal.

Since World War II, the United States has experienced a “suburbanization movement” unparalleled in its history (Committee 1970). The population growth has been concentrated in the urban and suburban areas. Accompanying this demographic change, the cities have “spread out” in a horizontal pattern. Tracts of land in virtually every city extending far into the surrounding countryside have been shifted to shopping center, subdivision, homeownership, new business, and other urban-oriented uses. New and improved transportation corridors have taken significant amounts of rural land and have also contributed to extensive land subdivisions around urban centers. By the spreading out, low-density, fragmented, and automobile-dependent development comes up. This phenomenon is commonly referred to as “urban sprawl.”

Most of this urban sprawl has expanded onto lands previously applied to agricultural or other open space uses. Thus a great amount of agricultural and open space lands have been converted into more intensive uses. And it has been the developed farmlands that have usually been picked off first for development (NRRER committee 1970). In addition to the rural land actually converted to urban uses, a significant amount of agricultural land is often idled prematurely in anticipation of conversion.

Developers, investors and speculators have been active in bidding up rural land prices. Farmers in turn have had many opportunities to sell their holdings either piecemeal or in total. Not unexpectedly, land values in many urban fringe areas have increased drastically. In these areas, the market value of land is often several times

greater than the current use value. Accordingly, the assessment of such land may rise several-fold.

Although farmland near an urban area may be increasing in value, higher property taxes must be paid out of current income consequently. Proximity to an urban area does not significantly increase the current incomes of farm and open space landowners. Not only the owners of land used as farming and forestry but also owners of other land that has low economic productivity, but which is of scenic or ecologic value, may find that the increased taxes are more than they can afford. Thus, landowners on the urban fringe may experience a tax “squeeze” as property taxes rise faster than the income from the current use of the land (Dunford 1984). As a result of this tax squeeze, landowners may begin to put their land on the market sooner, rather than later.

This tax squeeze, which decreases the profitability of farming on the urban fringe, may contribute to further sprawl. When some farmers find out that they cannot afford the continual increase in their property taxes they may sell their land to individuals developers and inspectors who are willing to pay relatively high prices for the potential lucrative land. After these parcels are scattered throughout the rural-urban fringe, urban sprawl will be encouraged. Thus the market value of the nearby agricultural land will be pushed higher, eventually generating more urban sprawl. In summary, “urban sprawl tends to produce more sprawl in a type of vicious circle (Dunford 1984).”

Declining farm profitability, rising property taxes, expanding urban growth, and soaring land values have all contributed to the loss of farmland. This growing threat to

U.S. farmland has become more serious in the economic environment of the 1980s. Farmland, which occupies over 60 percent of America's privately owned territory, not only provides food and fiber, but also preserves open space, filters and stores water, supports wildlife, conserves rural resources, enlarges life style opportunities of an urban society. What happens to agricultural land matters to a vital sector of the economy and to a significant feature of the America's landscape.

A general concern about agricultural land use has resulted in widespread political support for laws and regulations to control agricultural land use conversion (Wunderlich 1997). All states have responded to this threat by enacting tax legislation to preserve agricultural, forestland, and open space land. Of the several types of tax programs designed to retard the loss of agricultural land, the most widely adopted program is use-value assessment that is often used interchangeably with the term preferential assessment. (Rodgers and Williams 1983). Starting with Maryland in 1956, till now almost all the states have adopted the use-value assessment legislation that allows certain agricultural and open space lands to be assessed at current use value rather than market value for purposes of local property taxation aiming to retain agricultural and other nonurbanized properties in their present uses.

The NRRER committee (1970) specified the three principal motives that have prompted this interest in the use-value assessment: (1) concerns over the need for keeping high grade agricultural lands in agriculture; (2) a desire to retain existing high grade agricultural and other undeveloped lands around cities as open spaces for greenbelt, scenic, and esthetic reasons; and (3) the hope that tax measures can

implement the efficient and orderly use and development of rural lands around cities for their most social desirable uses.

Each of the state laws has its uniqueness in dealing with the rural land taxation, but enough similarity exists among these laws. To justify their general classification, the NRRER committee on the Impact of Use-Value Assessments on Farm Land (1970) divided the program into five groups: (1) classified property taxes that give preferential treatment to rural or agricultural lands, (2) simple provisions that require assessors to assess land at its current use-value, (3) deferred taxation arrangements under which qualifying lands are assessed at their current use-values but are subject to rollback taxes at the time they shift to other uses, (4) deferred tax and rollback arrangements that limit eligibility for participation or provide special tax incentives to lands that have been zoned or classified for special uses, and (5) arrangements involving the public acquisition of development-right easements.

The NRRER committee (1970) also outlined the leading different aspects among the individual laws center around their provisions. They are:

- (1) size of eligible tracts,
- (2) prior use requirements,
- (3) productivity requirements,
- (4) permitted uses,
- (5) systems for determining use-value,
- (6) voluntary or mandatory participation,
- (7) term of classification,
- (8) termination of classification,

- (9) rollback provisions,
- (10) application to partial sales or conversions,
- (11) application to buildings and improvements, and
- (12) treatment of eminent domain and forced conversion.

The primary advantage of use-value assessment appears to be that it allows some farmers to continue in agriculture at their present location. Although it may slow the pace of land conversion temporarily, use-value taxation does not appear to be capable of substantially altering the timing or pattern of development (Hanson and Schwartz 1975). Coughlin (1980) claimed that as part of a comprehensive approach to land use control, use-value assessment could be a useful tool, required for fairness to the restricted landowner, and whose cost may be justifiable in terms of the achievement of land use objectives. By itself, however, use-value assessment may provide a tax saving to participating landowners but will be ineffective in maintaining agricultural and other open uses in the face of development pressure. Dowall (1980) argued that preferential assessment of farmland is not an effective tool for controlling land use. Evidence suggests that it does not alter appreciably the conversion of agricultural land. Tax considerations are only a facet of the farmer's decision to sell out. Therefore, since preferential taxation assessment addresses only tax considerations, it is incapable of substantially altering the decision outcome. Most researchers agree that as a deterrent to the conversion of agricultural and open space land, use value assessment has had mixed results. In fact, use-value assessment has been relatively ineffective when used alone without other land use controls (Rodgers and William 1983). The International Association of Assessing Officers (IAAO 1974) concluded that although use-value

assessments can be effective in relieving property tax burdens associated with nonfarm market factors, their effectiveness as a land use control measure is another question.

There are essentially four major arguments against assessing farmlands on a use-value basis, summarized the IAAO. First, the effect upon land use is argued to be negligible. Secondly, after the overall tax base is reduced, either tax rates must be increased or public services curtailed. This can be a serious problem in jurisdictions in which the tax base includes a relatively large amount of farmland with high nonfarm value. Thirdly, use-value assessments may create a number of administration problems. Fourthly, many tax administrators and students of public finance argue that all real property should be valued for taxation purposes upon a full market value basis or a uniform percentage.

The International Association of Assessing Officers (IAAO 1974) also gave out the two major concerns which arguments for use value farmland assessments center upon: (1) concern for the economic viability of the farmer, and (2) concern over land use and the environment.

In Hansen and Schwartz's (1975) study of the landowner behavior at the rural-urban fringe in response to preferential property taxation, their major conclusion agrees with those of most other researchers - that use value assessment programs only have a limited effect on land use control. However, their study suggests that higher numbers of landowners at the urban fringe should enroll if they are economically rational and not excessively inclined towards risk acceptance, which is out their expectation. Yet they still insist that use-value assessment would be ineffective in reducing sprawl because of the scattered nature of fringe area enrollment.

As to the arguments about administration associated use-value assessment, many researchers found that the administrative problems of market value assessment were not solved, however, and in fact new ones were created. Ladd (1980) argued that the new problems are created because use-value assessment rules out the comparable sales approach, since land prices on developing areas will reflect the expected returns from speculation as well as the returns from current land use. Dowall (1980) criticized that the preferential property taxation is a blunt policy instrument and it generates benefits that appear to be regressive. Land use planning in most states is not well integrated with this tax preference scheme. He hinted a linking of preferential property taxation with other direct forms of government regulation of land, with the Oregon's program being an example.

After a careful study of their survey of use-value assessment laws in the South, Rodgers and Williams (1983) gave out the factors that are responsible for the ineffectiveness of use-value assessment as a land use control. First, it only reduces the cost of property taxes. Other factors such as the costs associated with labor, fuel, fertilizer, etc. are not addressed. Another uncontrollable factor is that the landowner may accept a high offer regardless of the fact that he is still receiving a reasonable profit in his farming operation. The voluntary nature of most use-value assessment programs also tends to reduce its effectiveness. Lastly, the effectiveness is dependent upon the efficiency of the implementation by local officials.

Although a number of controversial arguments exist, use-value assessment persists and has been widespread. A survey of the various states indicates that nearly all have adopted a use value approach or some form of a use value approach (Kelly 1998).



### Part C. Forest Taxation

Property taxation is also a continuous issue of discussion in the field of forestry, probably it has received most of the attention over the years. A number of studies have been conducted to determine the effect of taxes on the forest crop and to attempt to find better methods of taxing forest stands. It continues to be a problem mainly due to the inherent nature of the property tax itself and of the forest property to which it is applied.

As we all know, property taxation has a number of detrimental characteristics, such as the problem of valuation, equity, and non-revenue effects. But since forestland is a peculiar kind of property, these problems become even more obvious and difficult. Forestland has different characteristics depending on its particular position in the social, political and economic worlds as well as on its inherent physical nature. An undeveloped park in an urbanized area may look very much like the forested portion of a suburban estate, and both may resemble extensive forested areas in the sparsely inhabited hinterland. But the benefits these forestlands can produce are quite different because of their location and the special social, economic, legal and political forces and constraints that bear on them (Cooper and Worrell 1971). But changes in our economy and society are tending to obscure any absolute differences between rural and urban life. The urban sprawl makes it difficult to generalize about “city” and “county”. Forested land is caught up in this process and timber-growing productivity may no longer be a valid measure of property value in many places.

The most outstanding feature of forest production is that timber grows in a long rotation. During the growth of the stand, not only is capital invested for establishment,

improvement, and protection, but also money is paid out yearly for taxes. The forest owner will not see any return from his investment until the timber is harvested. That is, the timber crop is somewhat different than the agricultural crop because of the number of years required from planting to harvest. Although capital is invested from planting through harvest in both the agricultural crop and the timber crop, the farmer will usually realize a return within a year or so; whereas, the forester may not see a return on the investment for as long as 20 to 30 years or more.

Among the multitude of studies of the problems created when property taxes are applied to the forestland the keystone study was conducted by Fred Rogers Fairchild and his associates. Their report has been used as a basis for studies and understanding in the area of forest taxation. Fairchild and associates (1935) point out three causes for tax obstacles to the practice of forest lands: (1) the high cost of local government, since, if government expenditures are high, the tax burden must necessarily be heavy; (2) the faulty administration of the property tax, whereby forestry may be bearing more than its fair share of the cost of government; and (3) the inherent disadvantages of the property tax in respect to deferred-yield forests.

Ramsing (1962) claimed that aside from the inequities that may arise from assessment values in the forest industries, property taxes could have a very pronounced affect on the management of private forests. The concerns of the management problems are focused on the length of rotation; intensity of management; and intensity of harvest.

The ad valorem property taxation of forestry properties has been criticized for discouraging timber producers from improving forest productivity through investment, for bias against land that does not produce an income from an annual crop, for

uncertainty over the long period required to grow trees, and for encouraging the premature cutting of timber, concluded Greene (1995).

McDonnell (1979) argued that the tax level on forest land is so high that it kills the incentive to grow trees. Depending on rotation, yields and tax rates, one-third to one-half of annualized gross stumpage income commonly goes to pay property taxes under a property tax system that is not modified when applied to a forest. In fact, the forest farmer's greatest incentive is to harvest trees in order to offset timber tax. Little disagreement exists on this point.

Another universal argument is centered on whether timber should be taxed the same as the agricultural crops. Some feel that timber is a crop and, therefore, should be treated the same as other crops and not be taxed. Others feel timber should be taxed like any other property at market value each year, or if a substitute taxing system is used, tax paid should be equivalent to what would have been paid had property tax been applied annually to timber value.

Landowners, foresters, tax administrators, legislators, and others have debated about the property tax systems applied to forest for decades without any agreement. This seems understandable, because the systems themselves are constantly changing, and furthermore the levels of taxation and administration vary widely from one state to another, and even from one county to another. Due to differences in tax laws, state constitutions, forestry practices and forests themselves, it is difficult for one to prescribe a broad, general solution to forest land taxes.

Because of the profound influence of forest taxation on many states and local economies and on forest productivity, the tax burden on timber and forestland has

forced consideration of alternative modes of taxation. McDonell (1979) stated that one of the most popular alternatives to a property tax on timber is a yield tax (i.e. taxes paid on the value of timber at time of harvest). For some time, most yield taxes have been optional laws, enacted to provide owners with an option to annual ad valorem taxes. The recent experience with mandatory yield tax laws have been in the West. In 1971, Washington adopted a new law substituting yield tax for property tax on timber harvested from private lands. The law annually values and taxes forest land on the basis of current use. California and Oregon have followed Washington with similar yield tax laws. From a timber owners' viewpoint, removing the annual property tax on timber also eliminates the need to cut timber just to avoid annual property tax. Since the tax is deferred until income is received. On the negative side, many owners are concerned about the yield tax rates and possible changes by legislatures.

Another popular alternative is productivity approach to valuation of the land and timber, which is often found in the South and East. The primary advantages of forest productivity as a basis of taxation are predictability, continuity of revenue and the elimination of pressure for premature harvesting. But what constitutes productivity comes up. To complicate the problem, key assumptions such as interest rates, rotations, management levels and yield can have a tremendous impact on productivity values. And the change to productivity valuation can create substantial tax shifts from timbered tracts to nontimbered tracts, or from more productive lands to underproductive.

The other generally adopted forest taxation system is to taxing only the land. This seems to be ultimately equitable - treating forest lands the same as other croplands. But even in those states where only forestland is taxed, there can be

problems. Whether land values established for assessment reflect only land value is an open question, the “bare land” value often includes some timber value.

“Forest land tax, regardless of the system, is complicated by a nationwide movement of citizens into the forests to recreate, live or invest. Sales of scattered tracts of forest land, often for nonforest uses, and therefore at values not correlated to forest use, have become a nationwide phenomenon,” said McDonell (1979).

Thus the current use value assessment is imported to forest taxation with the attempts to solve the property tax valuation problem on these lands. This concept has spread out as population and reappraisal pressures grow.

Preferential taxation laws, have had a variety of consequences in the states that employ them (Ching and Frick 1970). “One of the impacts is that they have given forest landowners the opportunity to look at the management of their land with a ‘different set of glasses.’ While many elements enter into management decisions - including short- and long-term markets for timber, environmental condition, and personal factors - the property tax burden can often determine whether the land is maintained as a farm or forest or converted to a more intensive use. By eliminating or minimizing an unfair property tax burden, use-value assessment programs can have a significant impact on decisions of private forest landowners.”

Due to the difference of laws and their different objectives, the actual impact of this preferential property tax system on forest management varies widely. “Northeastern states, in particular, report that use-value programs have resulted in more intensive management of private forest lands and better employment opportunities for private consulting foresters. Southern and western states report that though the property

tax burden on forest landowners has decreased significantly, there has been little effect on forest management,” according to their study. In Chang’s (1980) study, he claimed “Based on the fiscal neutrality principle that forest taxes should neither hasten nor delay the harvest decision, the current trend of replacing an unmodified property tax with some sort of tax on land plus a yield tax clearly is not the optimal solution in most instances.”

After their study of property tax treatment of agricultural and forestland in Canada, Greenwood and Whybrow gave some recommendations for future policymakers:

1. Rely on planning and zoning, not tax incentives,
2. Use tax adjustments,
3. Permit multiple classifications of a property,
4. Monitor tax expenditures,
5. Plan infrastructure development,
6. Place heavy taxes on development land,
7. Prefer compulsory approaches to voluntary,
8. Remove development rights from easy influence, and
9. Consider the price to repurchase rights.”

It seems that Chang’s (1982) statement can be a good conclusion for this review, “General tax economists should find taxation of forest property of interest for two reasons. First, commercial forestland in private ownership comprises more than 15% of the nation’s total land area. Second, the results of forest taxation studies apply readily to

taxation of renewable resources in general.” This strongly suggests that our study is very important and necessary.

## CHAPTER 3 TIMBERLAND TAX POLICY IN DIFFERENT STATES

### Part A. Major Terms

Some states collect a forest property tax on both the value of the land and the trees while others collect the tax on the value of the land only. The tax policy systems vary substantially across the states. Major types of taxation are as follows:

**Ad valorem property tax**—the value of the land and the trees form the basis of tax collection.

**Productivity tax**—annual property tax is imposed in the capitalized value of the gross or net mean annual revenue from a forest.

**Site value tax**—under this system the value of the trees is removed from the tax base and a property tax is then collected annually on only the value of the land. A yield tax at the time of timber harvest often is combined with the site value tax.

**Flat property tax**—under this system the same amount of money per acre is collected on any acre timberland regardless of its value.

**Yield Tax**—a tax on the value of the harvested timber. The tax is collected after the timber is harvested.

**Severance Tax**—a flat tax on a specific unit of volume harvested (i.e., board feet, cubic feet, cords, tonnage etc.). The tax is collected after the timber is harvested.



## Part B. Timberland Tax Policy in Different States

**Alabama** In Alabama, all taxable property is divided into four classes, with each class having its own assessment percentage. Forest property is in class III, which includes all agricultural, forest and residential property, and historic buildings and sites. The assessment percentage of all property in this class is 10%. According to Alabama state laws, for ad valorem tax years beginning on or after October 1, 1978, with respect to taxable property defined in Ala code Sec. 40-8-1, a landowner may request that the assessors shall base his appraisal of the value of a property on its “current use” on October 1 in any taxable year and not its fair and reasonable market value. “Current use value” is the value of eligible taxable property based on the use being made of that property on October 1 of any taxable year. No consideration shall be taken of the prospective value such property might have if it were put to some other possible use.

With respect to “agricultural and forest property,” the tax assessor determines the productivity rating or rating applicable to a property based on its specific soil groups. The Alabama Department of Revenue utilizes timber yields based on the different productivity classes to establish an annual yield per acre in cords. This yield per acre, for each rating, is then multiplied by the average pulpwood price per cord as provided by the Alabama Forestry Commission. From this product, 15 percent shall be subtracted for expenses of ownership and management, and the result of that subtraction shall equal the “imputed timberland net income per acre” for property of each productivity rating. The “imputed net income per acre” figures for property of each productivity rating are then divided by the average of the annual effective interest rates

charged on new Federal Land Bank loans by the New Orleans district federal land bank for the 10 most recent calendar years since 1973 for which figures are available as of October 1 of each tax year. This rate is first reduced by the lesser of 4½% or the difference between such rate and 2%.

The results obtained are the "current use standard values" for property of each of the timber productivity ratings. The "current use standard values" for each productivity rating is then multiplied (by the tax assessor) by the number of acres of forest property of each productivity rating with respect to which a current use valuation is in effect. The result is the "appraised value." Once the appraised value is determined, the prescribed assessment percentage Class III property of 10% is applied to arrive at its "assessed value." The pertinent tax rate is then applied to determine the tax obligation of the property owner. The rate of taxation for state purposes is 0.65% annually on the assessed value of the taxable property in the state. (Ala Code Sec. 40-8-2). County, city and school district taxes are additional.

If a property for which a current use valuation has been approved is converted to any use other than that for which the application was filed, the tax assessor revalues the property according to the current market value. The tax assessor then bases his appraisal on the then current market value assessing such property accordingly for purposes of collecting any additional taxes due thereon. After conversion, taxes will be due based on the sales price or the fair and reasonable market value of such property at the time of its conversion, whichever is greater, for the preceding 3 ad valorem tax years.

To provide for further conservation of the natural resources of the state by protection of the forest products and development of the forestry program, a severance tax is levied against any forest products producer at different rates. (Ala Code Sec. 9-13-82) There is also a privilege tax levied against the processor of the forest products or the manufacturer using the forest products in an amount equal to 50% of the tax on the severer. The severance tax does not apply to individual owners of timber who occasionally sever or cut timber from their own premises to be utilized by them in the construction or repair of their own structures, buildings or improvements or for their home consumption or used by them in the processing of their farm products. (Ala Code Sec. 9-13-83) Because timber and forest products are subject to a severance tax when they are harvested, they are exempt from property taxes. (Chapter 5: Alabama Appraisal Manual, Alabama Department of Revenue)

**Georgia** For purposes of taxation, Georgia statutes break down property into 10 classes: Residential, Residential transitional, Agricultural, Preferential, Conservation use — applies to all land and improvements primarily used in the good faith production of agricultural products or timber and receiving current use assessment under Sec. 48-5-7.4, Code (Reg. Sec. 560-11-2-.20), Environmentally sensitive — applies to all land certified as environmentally sensitive property by the Georgia Department of Natural Resources and receiving current use assessment under Sec. 48-5-7.4, Code (Reg. Sec. 560-11-2-.20), Commercial, Historic, Industrial, and Utility.

Landowners in Georgia have the rights to choose alternatives for the manner in which the value of their timberland is determined. As of January 1, 1992, owners of

eligible land have three options for determining bare land value. These alternatives include:

- Fair Market Value (FMV), the primary property valuation method;
- Preferential Assessment for Agricultural and Forestry Property; and,
- Current Use Valuations for Conservation Use Property.

Land may only be valued for ad valorem taxation under one of the above alternatives. No combination of programs is allowed on the same land. The Agricultural Preferential Assessment and Current Use Valuation programs require certain commitments on behalf of landowners, and are available to qualifying properties only.

While analyzing the alternatives, one should keep in mind the basic purpose of each method is to determine a representative value for the property. Property tax bills for landowners, no matter which alternative is chosen, are based upon the following formula:

Assessed Value = Property Fair Market Value (or CUV, or Ag. Pref.) X 40%

Property Tax Bill = Assessed Value X County Millage Rate

One mill = \$0.001

In 1983, following a constitutional amendment, House Bill 230 outlined provisions for the "Preferential Assessment Program for Agricultural Properties" (Ga. Laws 1983, p. 1850, Section 3). It provided for a 30% level of assessment or 75% of the value at which other taxable real property is assessed. The bottom line result of entering the Preferential Assessment Program is a 25 percent savings from the FMV system of taxing the bare land. The owner's actual tax bill is calculated as follows:

Preferential Appraised Value = FMV X 75%

Preferential Assessed Value = Preferential Appraised Value X 40%

Tax Owed = Preferential Assessed Value X County Millage Rate

Participation in the Preferential Assessment Program requires the landowner apply to the local board of tax assessors for enrollment. The owner must: Dedicate the land to an eligible use for 10 years by signing a covenant; Meet certain requirements relating to property use and sale; and, Pay penalties if a change in land use occurs to a non-qualifying use.

The state of Georgia introduced a current use taxation program for qualified properties in 1992, called Conservation Use Valuation (CUV). On one hand, it was initiated in response to concerns regarding urban sprawl, land use transition, and the resulting environmental impacts from these changes. On the other hand, it was also instituted to provide tax relief for a broad class of Georgia property owners.

Under CUV, a landowner signs a 10-year covenant with the county to receive current use, as opposed to fair market valuation of property for taxation purposes. The details of Current Use Valuation of Conservation Use Properties were spelled out by the 1991 General Assembly in H.B. 283 and in 1993 by H.B 66.

As defined, Conservation Use Properties include: Agricultural and Forestry Property and Environmentally Sensitive Property. Georgia law goes further to distinguish Current Use Values from FMV or Preferential by requiring: The Current Use Value is determined by a formula which considers income capitalization based on soil productivity and market sales for different regions of the state; and, The actual Current Use bare land values are calculated centrally by the Department of Revenue,

which in turn distributes a table of values to each county in the state annually. Current Use Value Formula — The formula used to calculate Current Use Value of Conservation Use Properties is weighted as follows:

Sixty-five percent (65%) is attributable to the capitalization of net income from the property. For timberland, the income valuation increment of the conservation use valuation is based on the five-year weighted average of per-acre net income from hardwood and softwood harvested in Georgia. Thirty-five percent (35%) is attributable to values produced by a market study consisting of sales data from arms-length bona fide sales of comparable real property with and for the same existing use. Annually the Commissioner produces tables and standards of value for "current use valuation" of properties whose qualifying use is as bona fide conservation use properties. These tables serve as the basis upon which current use valuation of such qualified properties shall be calculated for the applicable tax year.

Industrial timberland is not eligible to employ either the Agricultural Preferential or the Conservation Use Value assessment. The assessed value of industrial timberland is 40% of FMV.

For ad valorem tax purposes standing timber is taxed only once following its harvest or sale at 100 percent of its fair market value. The severance tax liability is 100% of FMV multiplied by the local county millage rate.

**Mississippi** For property tax purposes, Mississippi classifies property into five different categories. Forestland falls under the category of agricultural use. Agricultural land, like other locally assessed real property, is assessed for property tax purposes at a specified percentage of its true value, according to current use (Miss Code Ann Sec. 27-

35-50 ). The tax rate for Forestland is 5%. An appraisal of land used for agricultural purposes must take into account soil types, productivity, and other criteria set forth in the land appraisal manuals of the Mississippi State Tax Commission. The income approach to valuation must be used, with a capitalization rate of not less than 10% and a moving average of not more than 10 years.

The Mississippi state tax commission publishes an annual schedule of "use values" based on the net income of an acre of land capitalized at 10%. The assessed value is equal to the capitalized value, which is published by the tax commission, times the state assessment rate of 15% (Class II property). The assessed value is then multiplied by local millage rates to determine total tax liability.

All growing, standing timber, trees and shrubs in the State of Mississippi, or any county, municipality, levee district, or other taxing district therein, are exempt from all ad valorem taxes. And shall be exempt from ad valorem taxes after severance so long as such timber, trees, or shrubs remain in the log state, or unmanufactured condition and so long as the title remains in any person other than the manufacturer or processor. (Sec. 27-25-27)

Mississippi levies a privilege tax upon each person engaged or continuing within the state in the business of growing, felling, cutting, severing and producing logs or any timber products from the soil or water, for sale, profit or commercial use; or purchasing, logging, or selling logs or timber products for commercial purposes.

**North Carolina** Certain forestland and open — space land is designated as a special class of property under the authority of the North Carolina constitution and, as such, is excluded from taxation or is otherwise specially treated. Forestland consisting

of at least one tract having a minimum of 20 acres in actual production and that is not included in a farm unit is designated a special class of property eligible for taxation based upon its present-use value if it meets certain ownership requirements. If the use of the land is changed, the difference between the tax based on a present-use valuation and the amount that would otherwise be due, together with any accrued interest, penalties or costs, is carried as a lien on the property as deferred tax. When the property, or any part of it, no longer qualifies for forestland classification, the applicable deferred taxes for the preceding three fiscal years, plus interest, are payable immediately. (Sec. 105-277.4, G.S.)

Standing timber is classified as a special class of property under the authority of the North Carolina Constitution and, as such, is excluded from taxation (Sec. 105-277 (15), G.S.). The purpose of this classification is to encourage proper forest management practices and to develop and maintain North Carolina's forest resources.

North Carolina has 6 Major Land Resource Areas (MLRA's) which are characterized by particular patterns of soils, relief climate, water resource, and land use. It is from these MLRA's that the basis of net income schedules are derived. Each schedule contains 5 net income ranges listed by decreasing income levels. A 100% assessment is applied to these values.

There is a severance tax when the timber is cut down. The assessment rates are based on some standards, different taxes rates levied on different kinds of primary forest products. Fifty cents per thousand board feet for softwood sawtimber, veneer logs and bolts; forty cents per thousand board feet for hardwood and bald cypress sawtimber,



veneer; twenty cents per cord for softwood pulpwood measured in cords; and twelve cents per cord for hardwood pulpwood measured in cords.

**South Carolina** For property tax purposes, land used to grow timber is classified as "agricultural use land" and is taxed on the basis of its fair market value for agricultural purposes in the state of South Carolina. If property in agricultural use is applied to another use, the property is subject to "rollback taxes" in an amount equal to the difference between the taxes paid on the basis of agricultural valuation and the taxes that would have been paid had the property been assessed as other real property in the year of the change and each of the five immediately preceding years. (Sec. 12-43-220(d)(3))

Each class of property is assessed at a ratio unique to that type of property. The assessment ratio is applied to the market value of the property to determine the assessed value of the property. Each county and municipality then applies its millage rate to the assessed value to determine the tax due. The millage rate is equivalent to the tax per \$1,000 of assessed value.

If a timely application is filed, agricultural real property is assessed at a ratio of 4% of its fair market value for agricultural purposes when the owner or lessee is an individual, partnership or small business corporation. When the owner is a corporation, the land is assessed at a ratio of 6% of its fair market value for agricultural purposes. Effective June 13, 1997, the fair market value of agricultural real property is the value from the 1991 tax year. (Sec 12-43-220) If the owner of agricultural land does not ask for classification of his land as agricultural property, the land is assessed at 6% of fair market value, rather than 4% of fair market value for agricultural purposes.

Section 12-43-220(d) of the 1976 Code, as amended, provides for the valuation of timberland at its fair market value for such agricultural use by the capitalization of typical net income. The procedure used to capitalize typical net income is as follows:

Timberland is valued based on the potential yield of the timberland site measured by the capability of the soils to produce timber with good management.

Values per acre are determined by: yield/acre X weighted price/cord — management costs. The value per acre determined above is then multiplied by 4% (the state assessment percentage for agricultural use land). That result is then multiplied by the local millage rate to determine the tax liability.

An assessment is levied on all primary forest products harvested from land within South Carolina to be deposited in the Forest Renewal Fund (Sec. 48-30-40). The assessment is actually levied against the processor (Sec. 48-30-70). The fund is to be used to provide financial assistance for landowners to increase productivity of privately-owned forests and to ensure that forest operations are conducted in a manner protective to soil, air and water resources.

In all, all the five states provide some forms of tax treatments of timberland to more favorable valuation. Georgia is the only state in this study that discriminates against the industrial owned timberland with a substantial difference, though the industrial owned timberland is also discriminated in South Carolina, the discrimination is minor. In all the states, timber is separated from the land for tax purpose valuation, but when the timber is cut down, a severance tax will be levied on it. A summary of major components of timberland taxation policies comparison is shown as in Table 1.

Table 1. Timberland property taxation policies in five southern states

State	Tax type	Timber land tax	Severance tax
Alabama	Productivity tax Based on net mean annual revenue	Current use at 15%	levied against producer for different products; privilege tax against processor 50% of the tax on the severer
Georgia	Productivity tax Based on net mean annual revenue	CUVA & APA for qualified lands Industrial land 40% at FMV	Basic formula is 100% FMV x local millage rate against producer
Mississippi	Productivity tax Based on net mean annual revenue	Current use at 15%, Plus a \$0.09/acre fixed levy	Pine and other soft timber at \$0.09/acre, hardwood at \$0.08/acre against producer
North Carolina	Site value tax	100% of current value	Different rate on different products against producer
South Carolina	Productivity tax Based on net mean annual revenue	4% of current use 6% if the owner is a corporation	Different rates Levied against processor

(Notes: Information of this Chapter is from the website: <http://www.timbertax.org>)

### Part C. Income Taxes in Different States

In addition to the property tax, income taxes also influence the profitability of timberland management. Since federal income taxes do not vary across states, they are not a discriminating factor, but state income may be important. We calculate a comparable Bare Land Value (BLV) for each state in our study in order to illustrate the impact that income taxes may have on production decisions. The BLV is calculated by using the software GP SOS. We assume an identical tract of timberland receiving the same prices and land treatments during the whole rotation. The assumptions and treatments of the land are summarized in Appendix B. As such, the base case BLV for each state is the same amount ? \$178.28 after federal income tax but before any state taxes. Then the BLV of the land with property tax and with both property tax and income tax are calculated in order to gauge the incremental impacts of these taxes. The values are summarized in Table 2.

Figure 1 shows the impacts of property tax and income tax on the land value in different states. BLV is the land value before taxes, BLV1 shows the reduction in value from the property tax alone, and BLV2 is the land value with both the property tax and income tax included. We can see that the property tax impacts are larger than the impacts of the income tax in Georgia and Mississippi, the two states whose property taxes are highest. In the other states, with relatively lower property taxes, the income tax impacts are larger. Nevertheless, Georgia maintains the highest tax burden and Alabama is the least taxed. This is consistent with the results when only the property

tax burden is considered. Though the income tax rate in North Carolina is the highest, the total tax burden is not the highest due to its low property tax.

Even though the income tax is important, it does not have a dominating power over the total tax burden. Furthermore, income tax is a fixed rate within each state and does not vary across the state. The property tax will often vary dramatically across counties when FMV is used to assess the property value. Thus, property tax systems will vary across states as well as within the same state. As a result of this variation, we will focus our analysis on the property tax alone in this thesis research.

Table 2. BLV with property tax and income tax in different states

State	Property tax	Income tax	BLV1	BLV2
AL	\$1.28/acre	5%	\$163.99	\$131.41
GA	\$3.90/acre	6%	\$134.73	\$98.26
MS	\$3.17/acre	5%	\$142.88	\$111.88
NC	\$1.78/acre	7.75%	\$158.41	\$108.56
SC	\$2.32/acre	7%	\$152.38	\$107.98

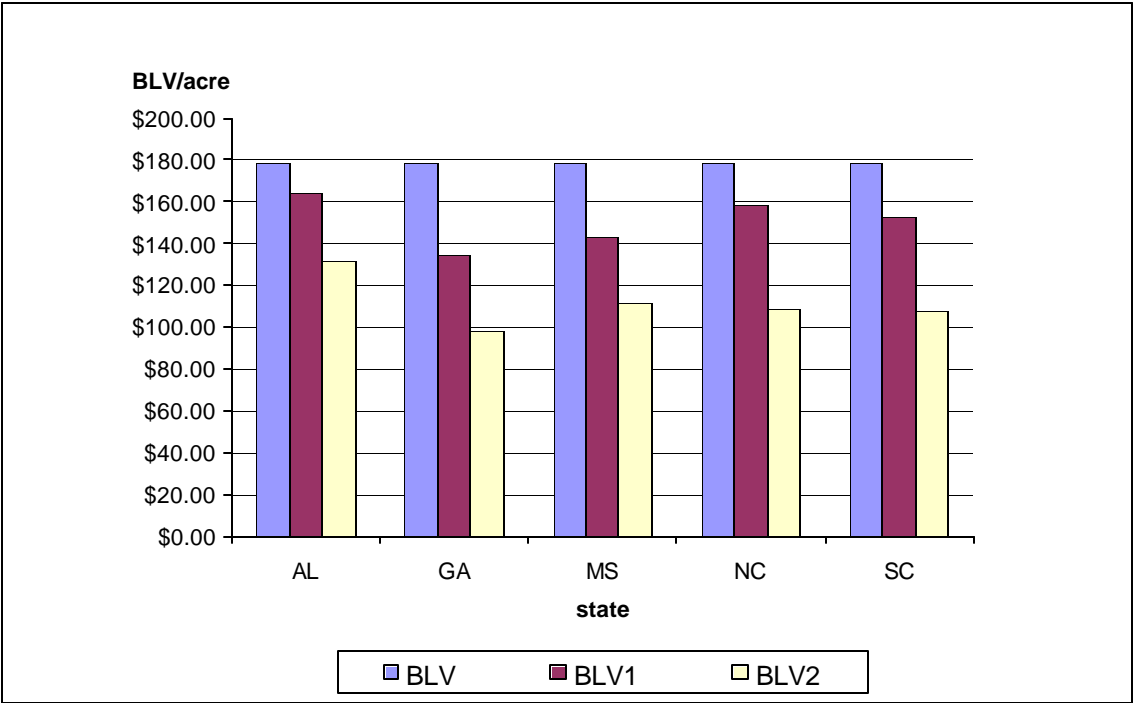


Figure 1. BLV without tax and after taxes comparison between the states

## CHAPTER 4 METHODOLOGY

### Part A. Data Description

The major part of the data used in this study is provided by our industrial cooperators. They are eight timber products based companies who own tracts in our studied states: Alabama, Georgia, Mississippi, North Carolina, and South Carolina. The data provided included the tract size, FMV, assessed value, and tax paid of their individual tracts. Then based on the need of our study, other information was collected on the internet. We organize the data both by the tract level and by the county level.

### Part B. Data Analysis

The study will focus on property taxes. A timber tax refers to any tax levied on stumpage or harvested volume. Timber processing taxes, or privilege taxes are excluded from the study, because these taxes are levied against the timber severer or other processor. This study attempts to measure only those taxes paid by landowners on their timberland.

In our study, a comparison of tax burden of the timberland owners across the states will be carried out to determine the impact of different taxation policies applied in different states. To do so, the county level data in each state are organized and the tax

per acre variation is analyzed in each state and compared across states. The use of GIS software package Arc View is applied in this section. The FMV per acre and tax per acre in different states are mapped by county in each state. Since our major objective is intended to give an implication of the situation of timberland taxation policy for Georgia to help develop tax policies that encourage the productive use of Georgia's forestland, a detailed study across the state of Georgia is also carried out. This study includes the regional and company level comparisons as well as the variation of tax per acre. Finally, the relationship between the FMV per acre and tax per acre and the tract size is studied.

It is important to know that the total tax burden values represent the annual total tax burden levied on the entire land base. The total tax burden divided by the land base yields the tax burden per acre value which is the main tool for our comparison in this study.

### Part C. Model Design

From the literature review and the data analysis, some major factors that are considered to have influence on the FMV of the timberland will be modeled with FMV per acre as the dependent variable. These factors include the tract size, population, population change, population growth percentage, highway, location, soil quality, different ownership of the timberland and the number of Conservation Use covenants in each county. There may be some social factors that have strong impacts on the FMV of the timberland are difficult to determine. Thus the variation of the FMV may be not



explained too much by the factors we consider significant, which will be a potential pitfall in this study. Another potential pitfall may be a variety of factors overlooked as insignificant, may prove to be significant in the long--run. SAS will be used to complete the statistical analysis. F tests will be the primary methods of testing statistical significance.

## CHAPTER 5 RESULTS

### Part A. Analytical Results

#### *A1. Comparison Between States*

Although tax policy varies across states, the basic line of every system is the FMV, on which the assessed value is based. As defined, FMV is “the amount a knowledgeable buyer would pay for the property and a willing seller would accept for the property in an arm’s length, bona fide sale.” (Dangerfield et. al, 2001) The basis of FMV is the belief that the real estate market, combined with other factors, offers a gauge of property value. Due to the variation of the factors, FMV varies a lot both across states and across counties in one state. With the Arc View software, the FMV in different states are mapped by the county level, as shown in Figure I in Appendix A.

As a whole, the FMV in Georgia is the highest among the five states in this study. As shown in Figure I in Appendix A, the lowest FMV/acre in Georgia is \$199 and the highest is \$2321, with 30% of the 92 counties in this study higher than \$500. These counties concentrate around the Atlanta metro in the northcentral while the lower FMV/acre is scattered in most of the southeast. Alabama’s FMV/acre is the next highest following Georgia. The lowest is only \$37 while the highest \$3958/acre is in Montgomery county where the capital is. In most of the counties, the FMV/acre is around \$300. Then comes the North Carolina with \$97/acre as the lowest and

\$2089/acre in Anson county as the highest. The average without the outlier is around \$270/acre. Mississippi is next state with a relatively high FMV/acre in the five states with \$26/acre as the lowest and \$284/acre as the highest and average \$195/acre extremes excluded. The state with the lowest FMV/acre is the South Carolina state. The lowest FMV/acre in South Carolina is \$9/acre and highest is \$858 and the average is \$188/acre with the extremes excluded.

This great disparity comes up mainly due to the different taxation systems employed in different states. And some factors, such as population, soil quality, and location (access to road, utilities, area development and other factors may enhance the land's value), also contribute to the disparity. Property tax is an important discriminating factor in forest production location decisions across states, since federal taxes are the same throughout and the state income tax is relatively minor.

We next discuss the assessed values for the state. Assessed value is calculated as some percentage of the appraised FMV. And each state has its own assessment percentage for industrial lands. Thus the assessed value of land varies substantially. The state with the highest FMV dose not necessarily have the highest assess value. As shown in Figure 2, the FMV/acre is highest in Georgia, but the assess value/acre is not the highest. That's because the assessed value is only 40% of the FMV in Georgia. Alabama uses a 10% fraction, so the assessed value is much lower. In North Carolina, the assessed value is 100% of the current use value, while in Mississippi it is 15% and South Carolina is 6% for the industrial timberland.

As shown in Figure 3, a high FMV does not necessarily result in a high assess value. And a high assess value does not necessarily lead to high tax either, since the

calculation formula for tax paid is: Tax = Assessed Value X Millage Rate. The millage rate also plays a part in deciding the tax paid. Thus to make a clear comparison of the tax burden for landowners in the five states, a tax/acre comparison is a feasible and effective way.

As in shown in Table 3 and Figure 3, the average tax/acre in Georgia is the highest in five states. Then follows Mississippi, South Carolina, North Carolina and Alabama respectively. The gap between the tax/acre of Georgia and Alabama is \$2.62. Not only does the tax burden vary between the states, it also varies between counties in a state. This is because of the different taxation system in the different counties and different tract sizes. Figure 4 shows the variation among states and within the states. Georgia's tax/acre is the highest and also has the most variation, the lower quartile is about \$3.00/acre, the median around \$4.00/acre, and upper quartile at \$6.00/acre. The highest value in Georgia is \$10.00/acre, which compares with the other states with highest values less than \$5.00/acre. The tax/acre in state of Mississippi is the second highest, but with less variation. The tax/acre in the Carolinas concentrates around \$2/acre. Alabama's tax is the lowest with least variation. Even the highest value is less than \$2/acre. Figure II in Appendix A of the mapping gives a much clearer view of the tax/are comparison between states as well as the comparison within each state. The average FMV per acre, assessed value per acre, millage rate and tax per acre in each states are shown in Table 3.

Table 3. Comparison of average FMV/acre, assessed value/acre, millage rate, and tax/acre for five southern states

State	FMV/acre	Assessed value/acre	Millage rate	Tax/acre
Georgia	\$476.33	\$190.53	0.043	\$3.90
Alabama	\$395.11	\$39.51	0.034	\$1.28
North Carolina	\$276.51	\$276.51	0.011	\$1.78
Mississippi	\$195.46	\$29.32	0.164	\$3.17
South Carolina	\$188.85	\$11.33	0.138	\$2.32

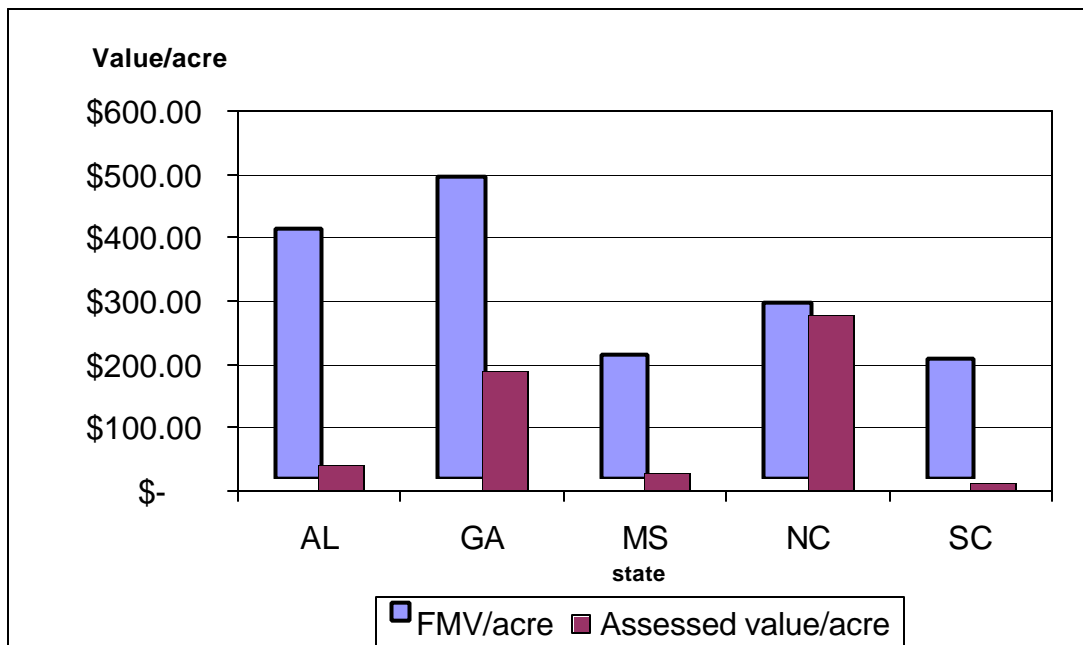


Figure 2. Comparison of average FMV/acre and assessed value/acre between the five states: 2000

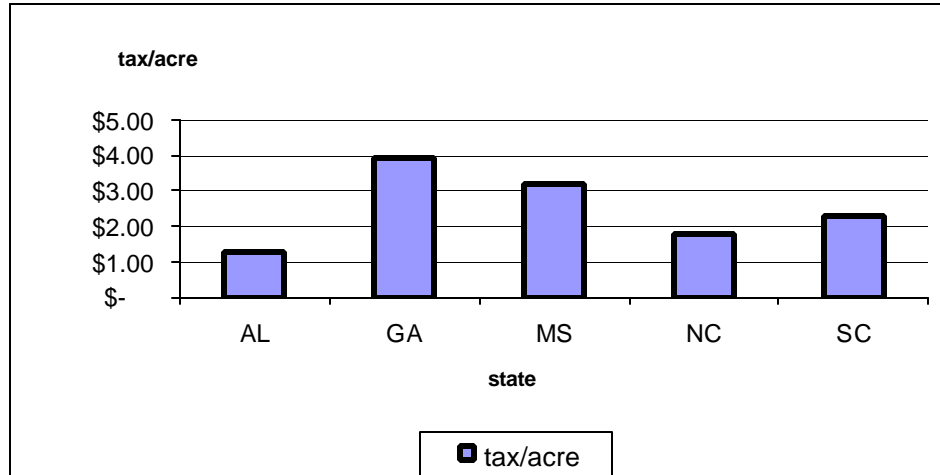


Figure 3. Comparison of tax/acre between the five states: 2000

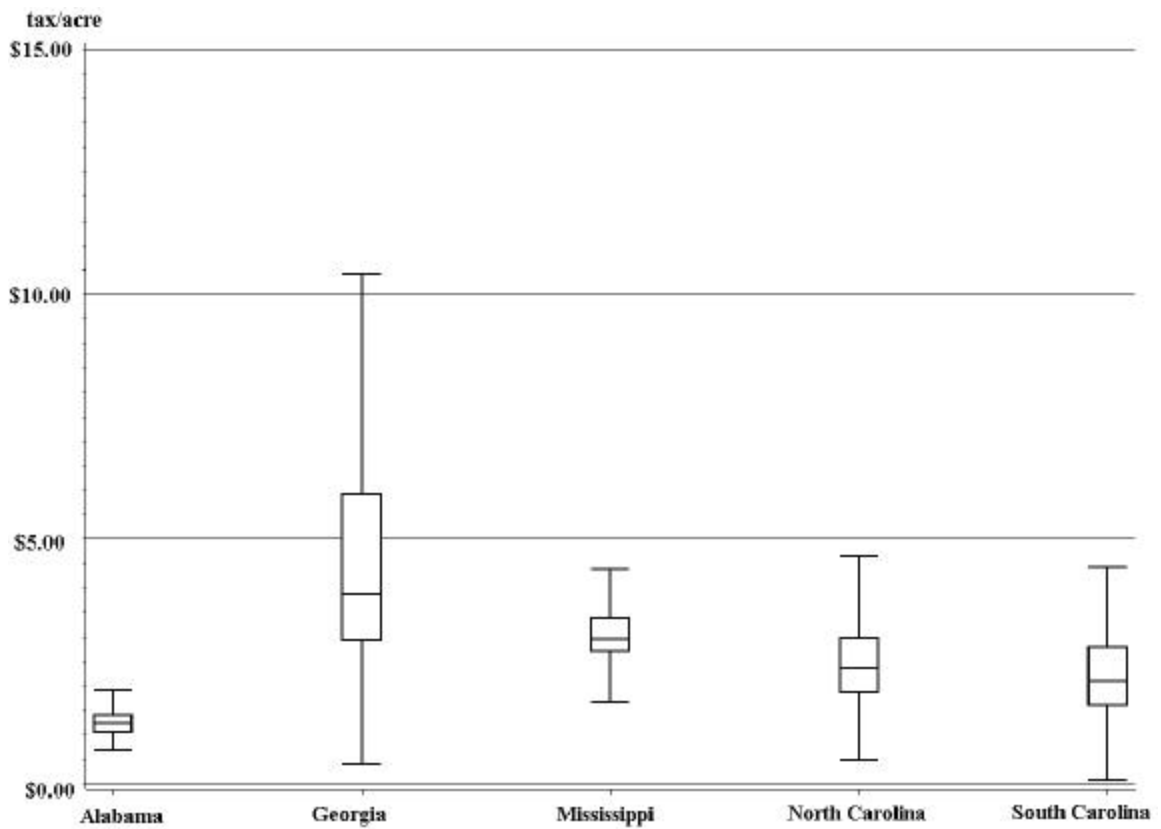


Figure 4. Box-Whisker plot comparison of tax/acre between the five states: 2000

An important consideration for determining fair market value of farm and forestland is tract size. In Georgia, typically, as tract size increases, per acre value decreases. This is true because of increased demand for smaller size acreage units of farm and forestland and lower transaction costs in selling the tract. With the data from one company that has tracts in both Alabama and Georgia, we can do a tract level comparison to see how the different tracts are treated in these two states, one has the highest tax and the other the lowest, one has the largest variation and the other smallest. Figure 5 shows that in Georgia, the tracts under 25 acres have the highest value and are treated with great variation while the tracts larger than 25 acres are treated almost the same, no matter the size. The median of tax/acre for all the categories varies between \$5.00 and \$10.00/acre. But in the state of Alabama, as shown in Figure 6, it is a different story. Different tract sizes are treated differently — the tracts under 25 acres have the lowest value and least variation. The tracts between 25 acres and 50 acres have the highest value. Then the values vary by tracts size class. Though increases, the median of the tax/acre is still less than \$2.00/acre.

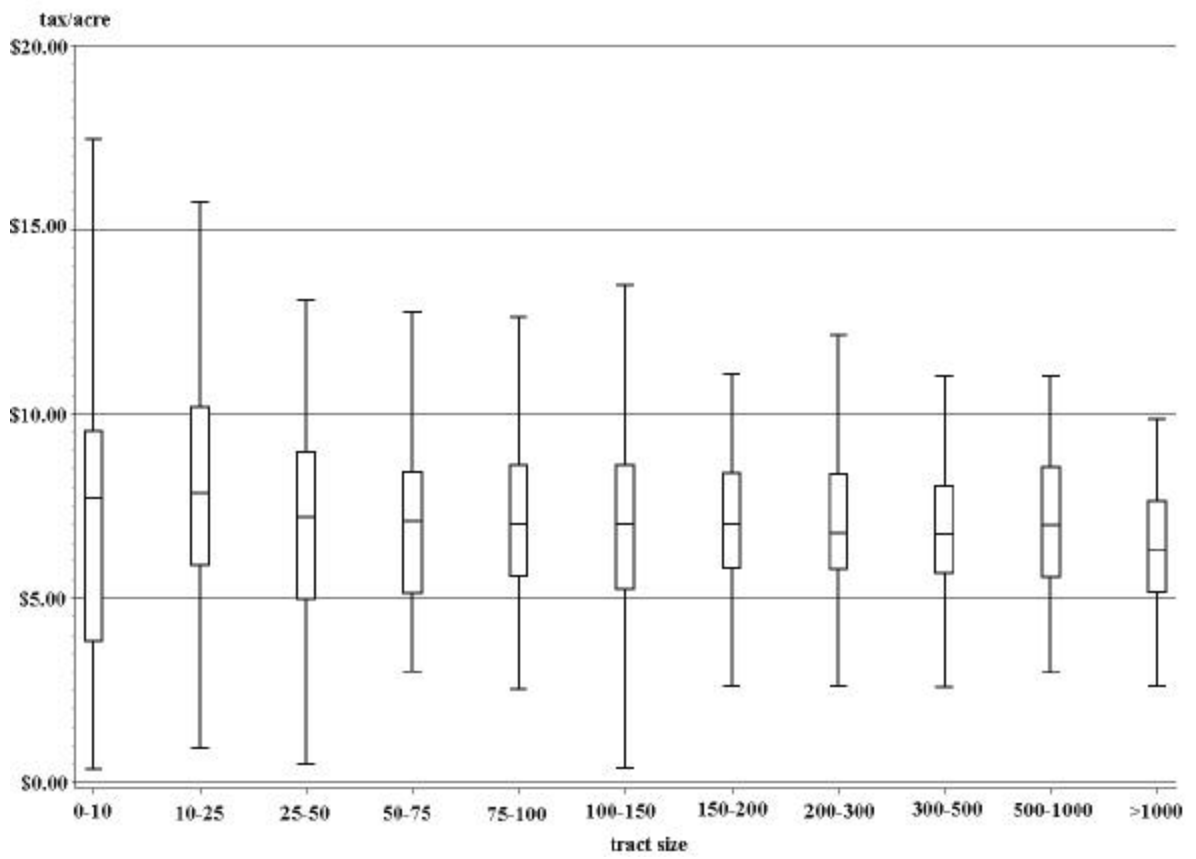


Figure 5. Box-Whisker plot of tax/acre by tract size classes in Georgia: 1999



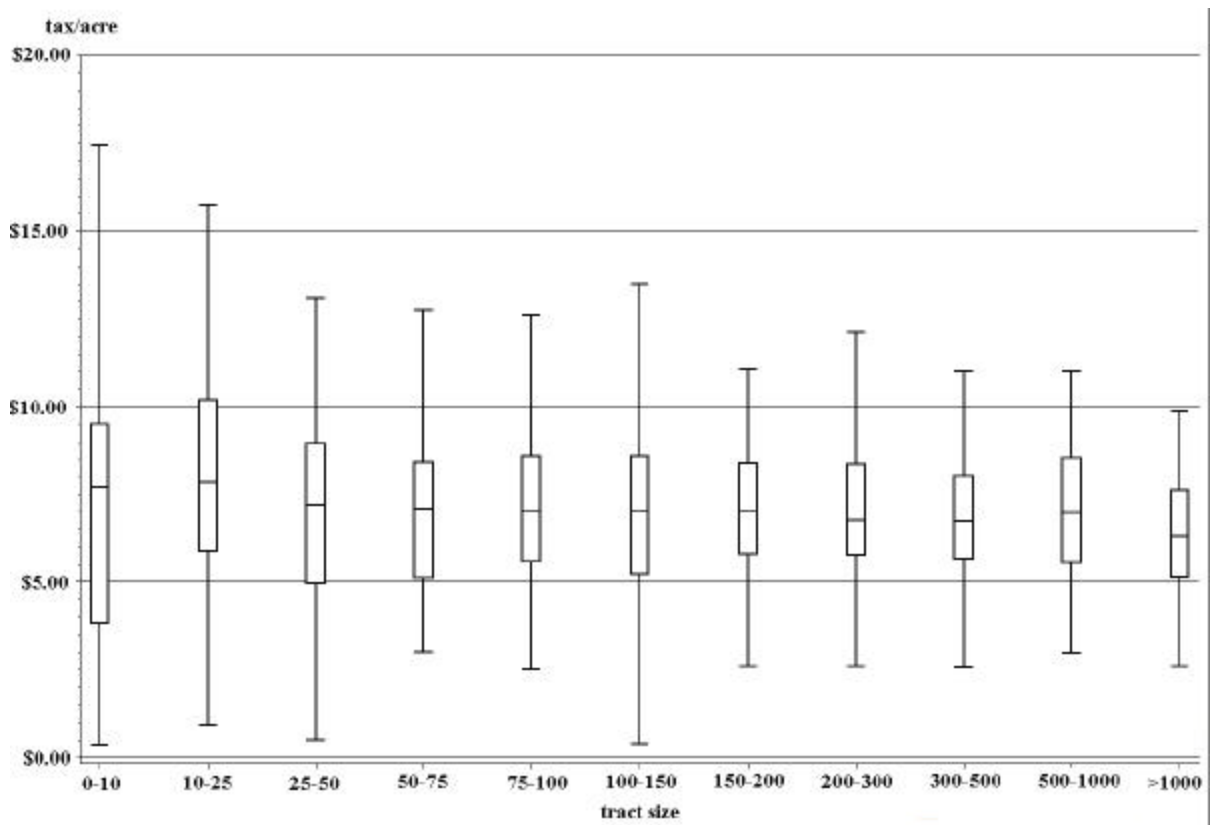


Figure 6. Box-Whisker plot of tax/acre by tract size classes in Alabama: 1999

## *A2. Tax Burden Analysis in the State of Georgia*

Property tax is the major discriminating factor in forest production and location decisions across states, since the federal taxes do not vary across states and income tax differences are relatively minor. Through the comparison between states, we can see that the tax burden of landowners in Georgia is relatively higher than its neighboring states. Thus the competitiveness of Georgia is at disadvantage. To give a meaningful and useful implication of Georgia's taxation system, we now assess the factors that leads to the high tax burden.

High FMVs may force landowners to sell their land, which could speed the transition of forestland into suburban development. In the early 1980s, FMV taxation system was found economically harmful to farming and forestry because the sales of property for development purposes in an area would inflate general land values above the supporting level of farming and forestry. In order to encourage forest management, the Agricultural Preferential Assessment and Current Use Valuation taxation system have been legislated in 1983 and 1992. With these two systems, land is assessed at a much lower percent of FMV, which results in substantial tax savings. These two regimes were initiated, in part, in response to concerns regarding urban sprawl, land use transition, and the resulting environmental impacts from these changes. It was also instituted to provide tax relief for a broad class of Georgia property owners. But they have special requirements, under which the industrial landowners are excluded.

In many of the counties surrounding Atlanta where the FMVs are relatively higher, the difference in taxes between a corporation using property for timber growing and a family owning a similar tract but which is qualified for the CUV is substantial,

perhaps greater than a factor of 10 to 15. Thus, if current use taxes on an individual's CUVA property may be around \$4.00 to \$5.00 per acre with an average conservation-use value of about \$400.00 and an average millage rate of 28 mills, the same land may have a FMV of \$4000.00 or more, giving a tax burden of \$40 to \$50 per acre. For forestry, these tax levels are near confiscatory, they approximate the annual income for the land in timber growing.

With the rapid development of Georgia's economy in the last couple of decades, property values have increased significantly. Consequently, timberland values have been also driven up ever since and as the result of increasing FMVs, the assessed value continues to rise. As shown in Figure 7, FMV/acre in Georgia increased 42% from \$346 in 1998 to \$490 in 2001, with a 19% increase from 2000 to 2001. Assessed values for industrial timberland likewise have increased. As a consequence of rising assessed value, property tax has been rising significantly, 35% increase from 1998 and 19% from 2000.

The relatively smaller increase rate of tax per acre than increase in the rate of the FMV per acre and assessed value per acre is due to slight declines in the county millage rate. The millage rate decreased 4.28% from 1995 to 1999 and more than half of the counties on Georgia dropped their millage rate from 2000 to 2001. Millage rate can be important in some counties. In Georgia, in 65% of the counties the millage rate is between 20—30 mills, with the highest 48.02 and the lowest 10.25. The range of millage rates are shown in Figure 8. In these counties where FMV and assessed values remains constant through 2000 to 2001, there was no drop of the millage rate. And as a result, the tax per acre in these counties either remains constant.

In the analysis of our data, we found location is the driving factor influencing property valuation. By comparing the tax/acre in different regions of the state (divided as north, central and south), we found the tax burden in the north of Georgia is the highest with the greatest variability. This analysis is based on the tract level data. As shown in Figure 9, the lower quartile of the tax per acre in the north is \$3.85/acre, the upper quartile around \$10.50/acre, and the median is about \$7.50, with the extreme at almost \$19.00/acre. In the central Georgia, the tax per acre is lower, with lower quartile at \$3.50, upper quartile at \$6.50/acre, median around \$4.00/acre and the upper extreme at \$11.50/acre. The tax per acre in the south is the lowest with the least variability. Most of the tax per acre is concentrated around \$3.00 to \$4.00 /acre.

The drastic impact of location on the tax per acre in the state of Georgia can also be shown by the comparison between the companies in Figure 10. The company with almost all of its tracts in the north has the highest tax burden and greatest variation. The rest of companies, have relatively low tax levels, relating to their locational advantage.

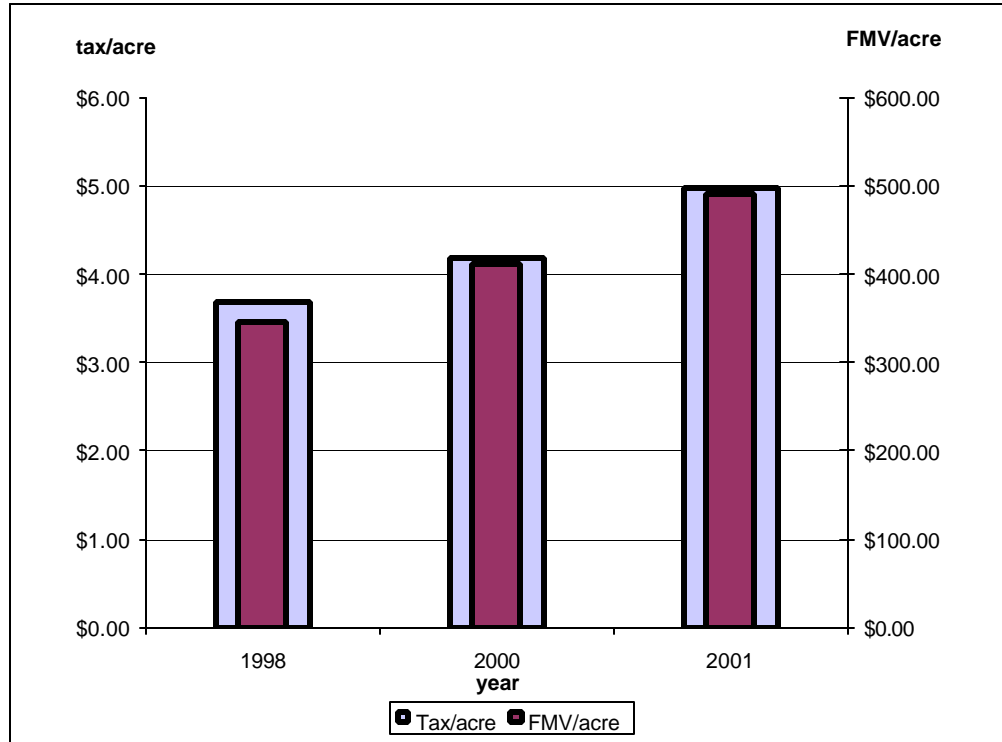


Figure 7. FMV/acre and tax/acre increases from 1998 to 2001 in Georgia

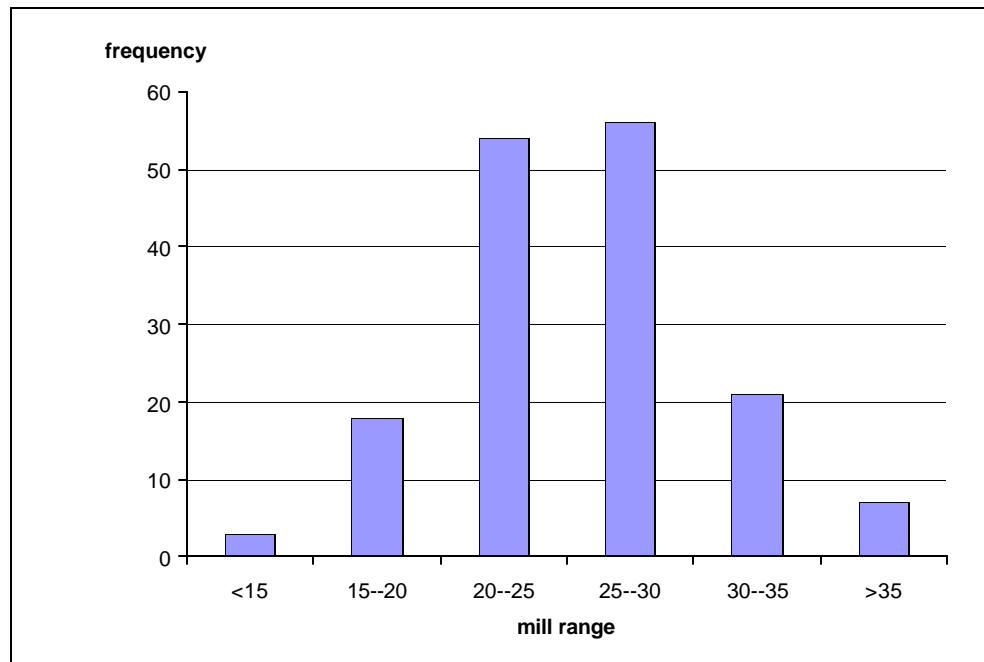


Figure 8. County millage rates distribution in Georgia: 2000

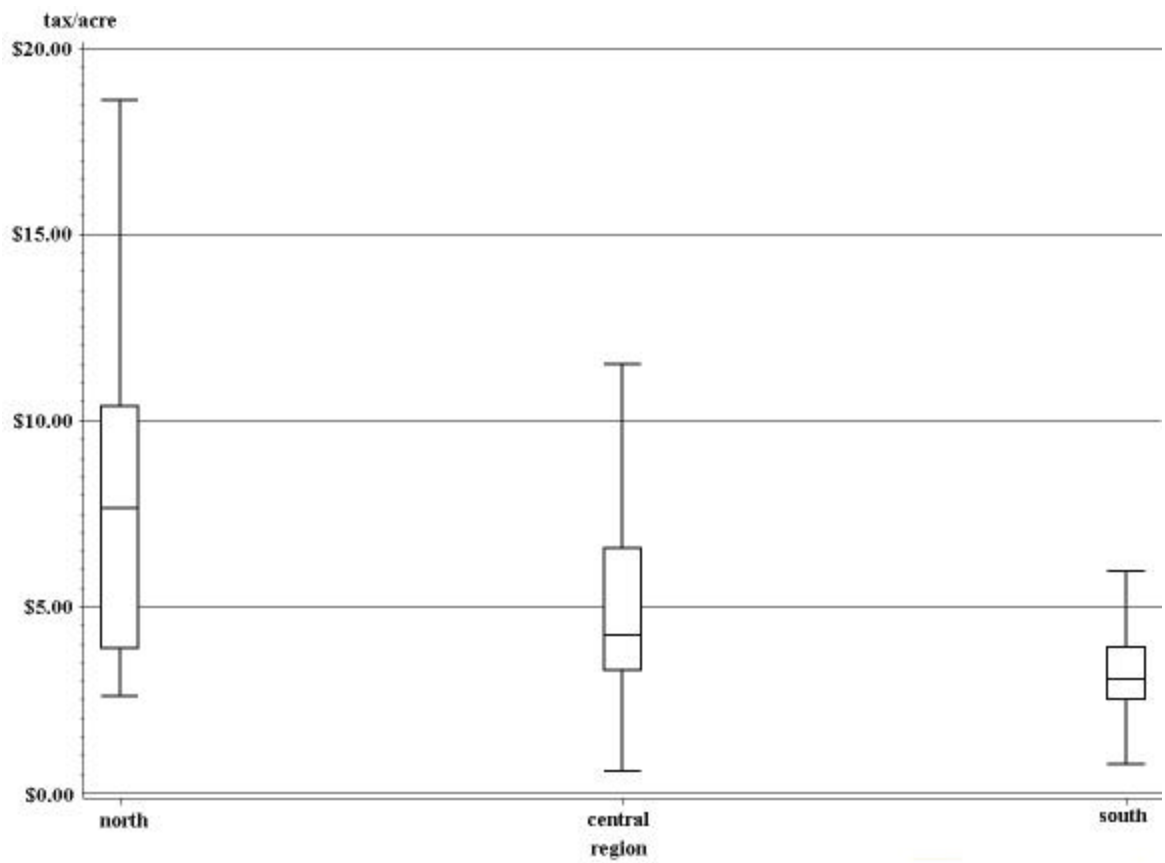


Figure 9. Box-Whisker plot comparison of tax/acre variations in Georgia by region

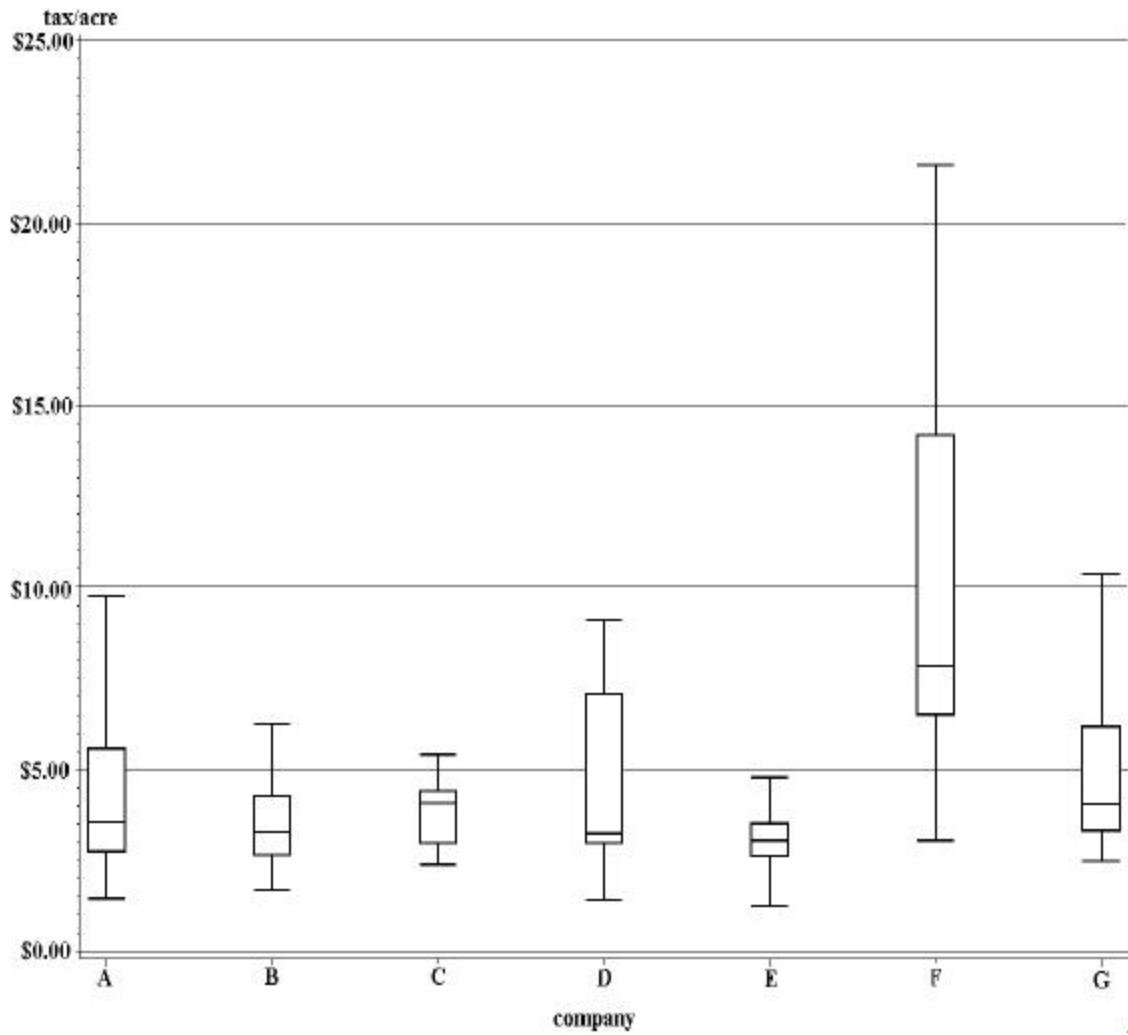


Figure 10. Box-Whisker plot comparison of tax burden for companies in Georgia

The main and perhaps the most important factor that determining the value of the land and the tax paid for the forestland is the tract size. Typically, as tract size decreases, per acre value increase. As shown by Figure 11, the comparison of FMV per acre by tract size categories in Georgia as a whole, the fair market value for the tracts of 10 to 25 acres is the highest and then it decreases as the tract size increases. This phenomenon is true because of increased demand for smaller size acreage units of forestland. In counties where comparable sales for forest properties are dominated by sales of smaller sized tracts, per acre dollar value for larger acreage tracts can be unfairly biased upward.

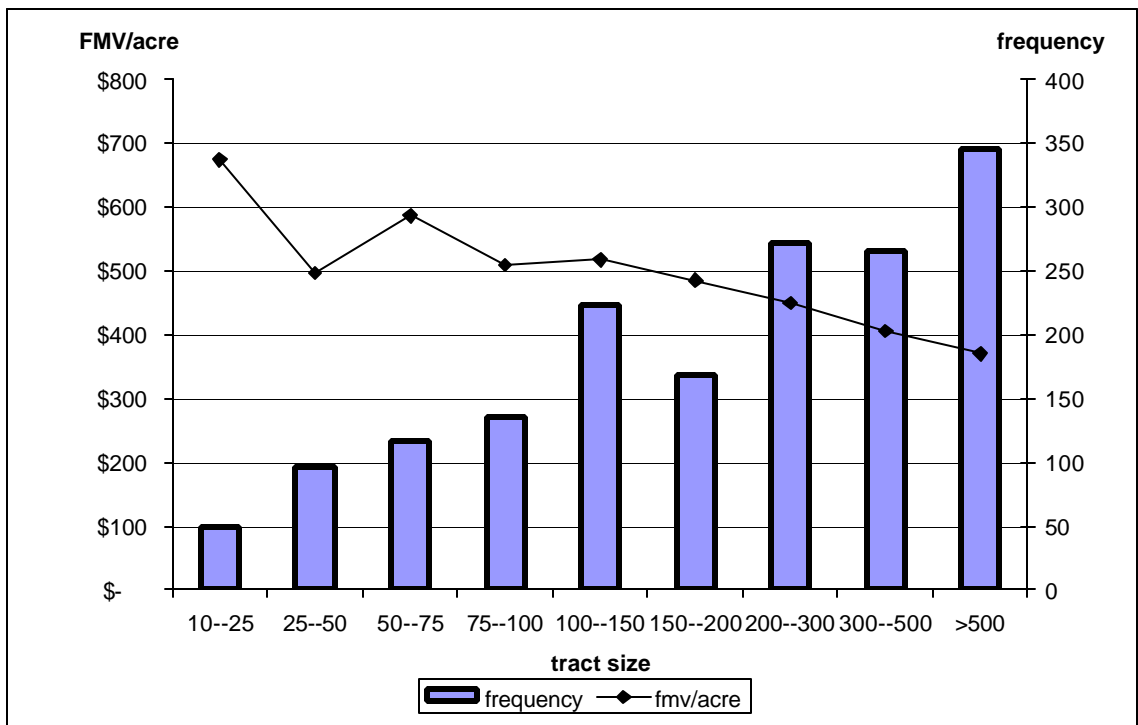


Figure 11. Breakdown of FMV/acre and number of tracts by tract size classes in

Georgia: 2001



In different regions, tracts are treated differently. As shown in Figure 12 and Figure 13, generally the average FMV and tax paid are declining with the increasing of the tract size in central and south, with the tracts between 10 acres and 25 acres have the highest value and pay the highest taxes. But in the north, the decreasing is less obvious. The tracts of 10 acres to 25 acres have almost the same FMV as the tracts larger than 500 acres. An implication of this treatment is fragmentation, because the large tracts that are managed for resource production will likely to be broken up into smaller parcels.

One outcome of this tax treatment is that the north is the most active CUVA region in Georgia. Furthermore, by doing the tract level analysis, as shown in Figures 14-16., there exists great variation in different regions in valuation different tract size. In the north, the per acre tax of each tract size level varies the most. This variation in the central is also great, but there is a clear trend that per acre tax paid is decreasing with the increasing of the tract size and less variation. The variation of tax per acre varies the least in the south, with the tracts of 10 to 25 acres pay the highest tax and the most variation. When the tracts are larger than 25 acres, they are treated almost the same, nevertheless the tract is 1000 acres or 50 acres.

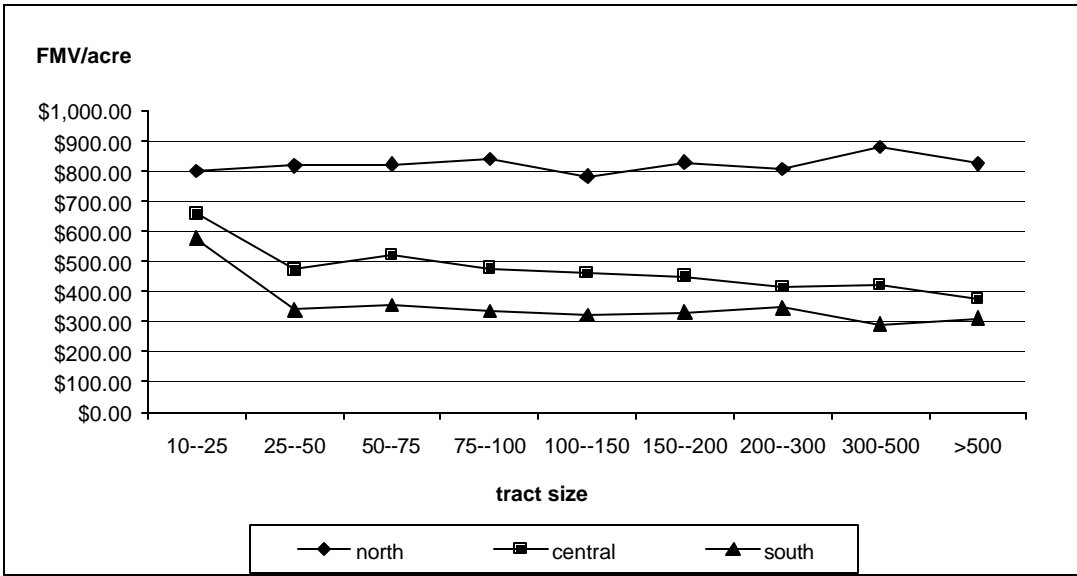


Figure 12. Breakdown FMV/acre regional comparison by tract sizes in Georgia

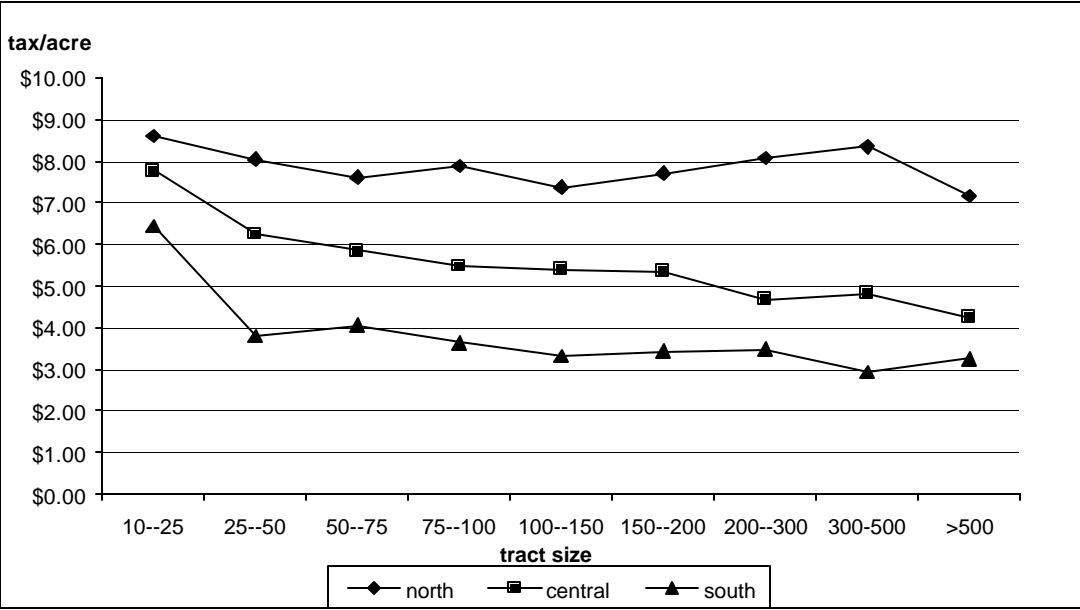


Figure 13. Breakdown tax/acre regional comparison by tract sizes in Georgia

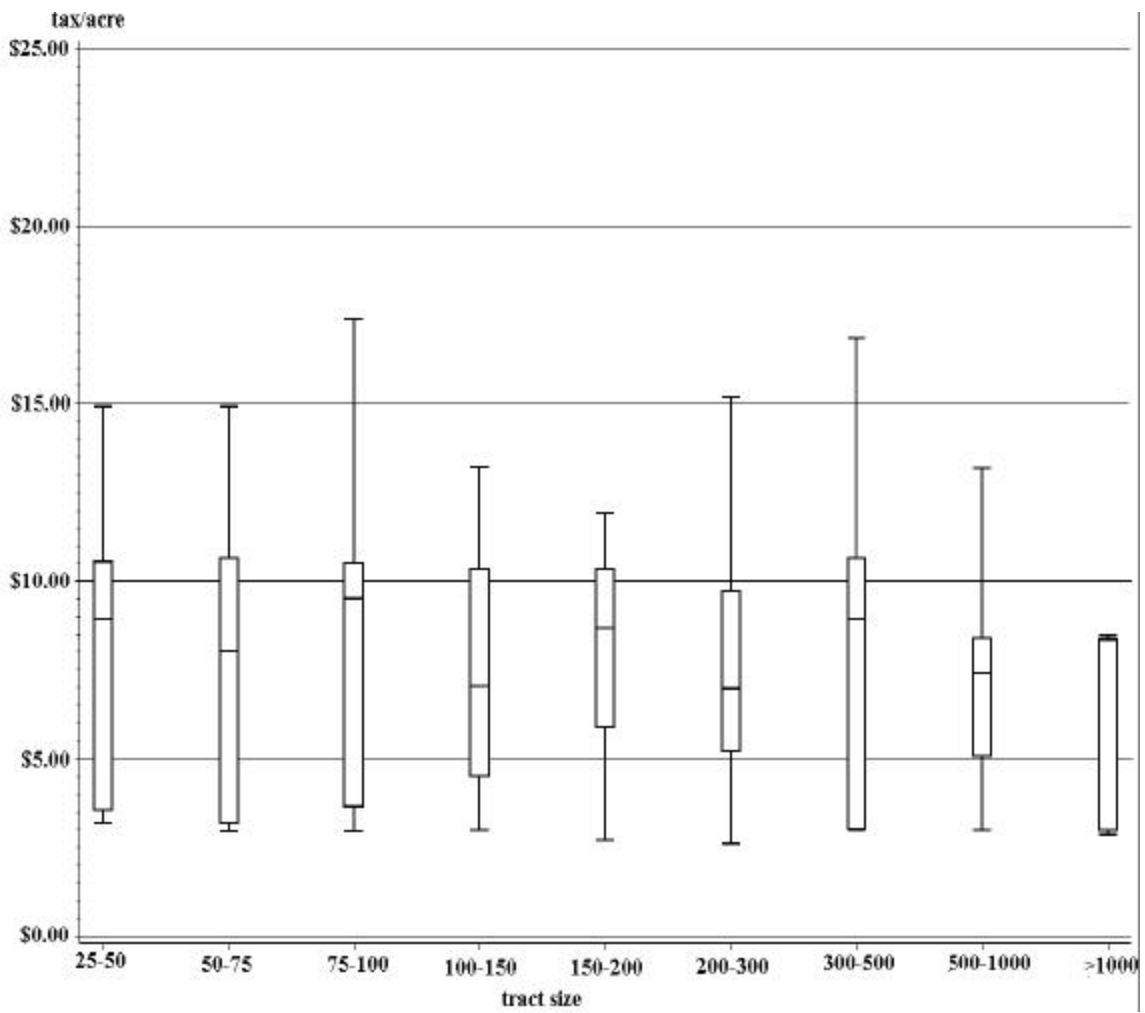


Figure 14. Box-Whisker plot of tax/acre breakdown by tract sizes in the north of Georgia

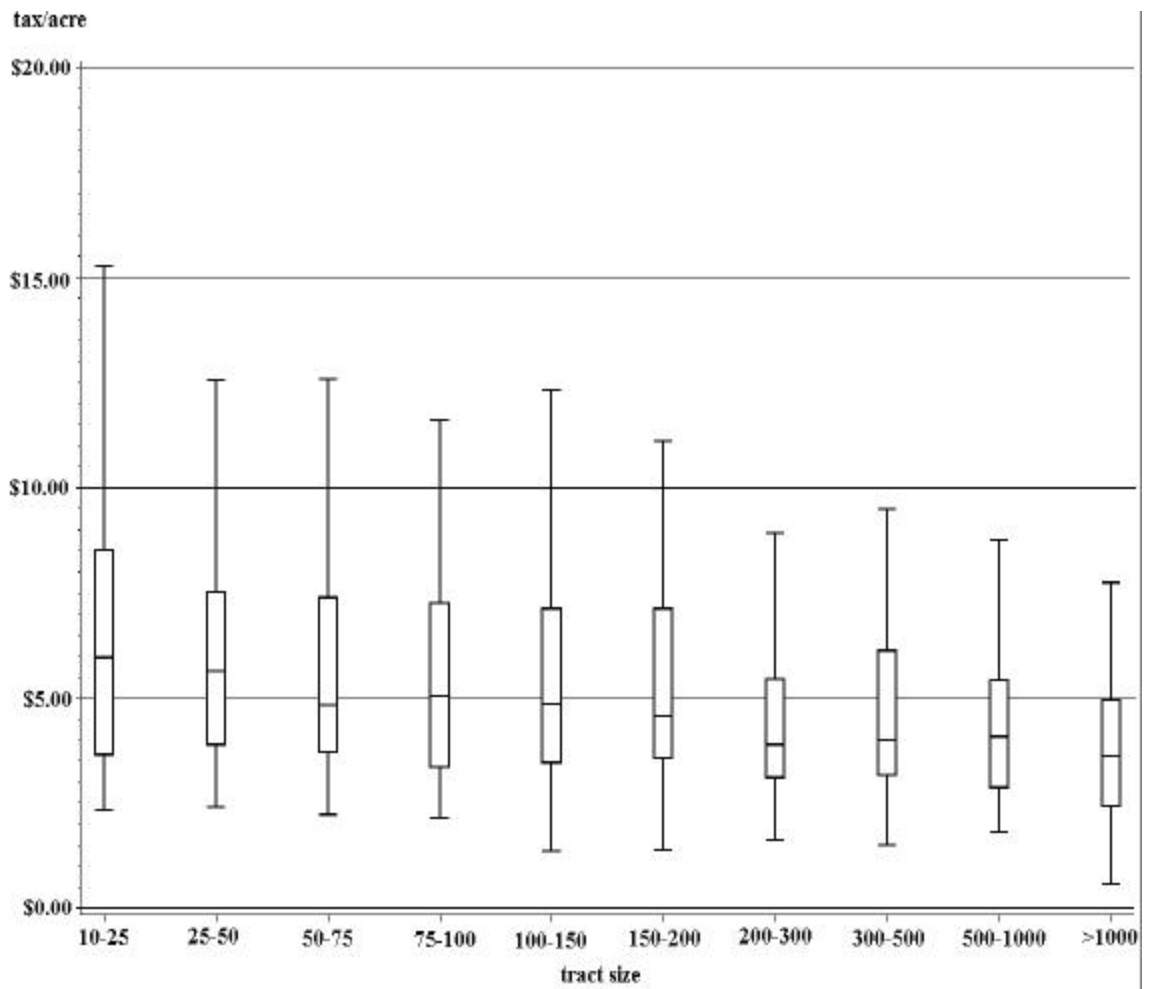


Figure 15. Box-Whisker plot of tax/acre breakdown by tract sizes in the central of Georgia

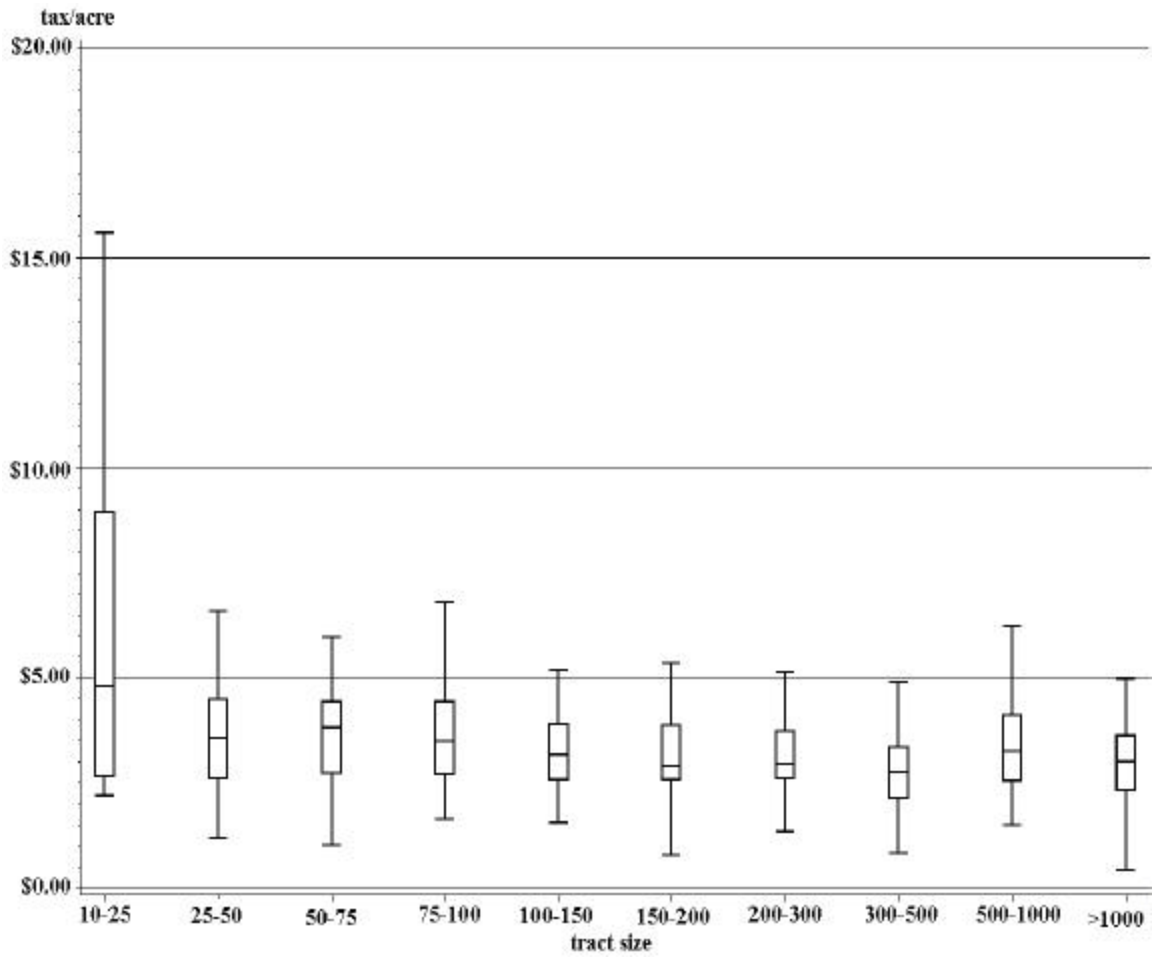


Figure 16. Box-Whisker plot of tax/acre breakdown by tract sizes in the south of Georgia

## Part B. Statistical Results

Although the price of the forestlands is hard to predict, with our analysis of the FMV across states and in the state of Georgia, both by the county level and by the tract level, we found that several factors are closely related to FMV. Thus, we will attempt to test the predictive power of these factors over the variation of the price of the land.

For the tract level study, we are able to build a model with the FMV per acre as the dependent variable with the independent variable we found reasonable as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10}$$

Y: FMV per acre

X<sub>1</sub>: total acreage of the tract

X<sub>2</sub>: 2000 population in the county where the tract is located

X<sub>3</sub>: population growth rate from 1990 to 2000

X<sub>4</sub>: population growth rate from 2000 to 2001

X<sub>5</sub>: millage rate applied on the tract

X<sub>6</sub>: number of CUVA covenants in the county where the tract is located

X<sub>7</sub>: X<sub>7</sub> = 1 if there is major highway running through the county

X<sub>7</sub> = 0 otherwise

X<sub>8</sub>: the region the tract is located, we divided the state of Georgia into five regions

according to the Forestry Inventory and Analysis (FIA) data as north, northcentral, central, southeast, and southwest. X<sub>8</sub> = 1 if the tract is located in the central,

X<sub>8</sub> = 0 otherwise

X<sub>9</sub>: X<sub>9</sub> = 1 if the tract is located in the southeast, X<sub>9</sub> = 0 otherwise

$X_{10}$ :  $X_{10} = 1$  if the tract is located in the southwest,  $X_{10} = 0$  otherwise

(Since our tract level data are provided by one company, there is no tracts located in the north.)

The statistical output is as follows:

Table 4. Statistical summary of the tract level model

<u>Analysis of Variance</u>			
Source	DF	F—value	Pr>F
Model	10	106.78	<.0001
Error	1672		
Corrected Total	1682		
R-Square	0.3897	Adjusted R-Square	0.3861

<u>Parameter Statistics</u>				
Variable	Parameter Estimate	Standard Error	<i>t</i> —value	<i>p</i> —value
Intercept*	549.81957	26.34839	20.87	<.0001
$X_1^*$	-0.00996	0.00405	-2.46	0.0140
$X_2$	-0.00039238	0.00039241	-1.00	0.3175
$X_3^*$	218.22804	56.54363	3.86	0.0001
$X_4^*$	2386.50950	509.51783	4.68	<.0001
$X_5$	6.87715	10.11144	0.68	0.4965
$X_6^*$	0.31133	0.02809	11.08	<.0001

X <sub>7</sub> *	90.58291	15.45310	5.86	<.0001
X <sub>8</sub> *	-229.26612	23.31954	-9.83	<.0001
X <sub>9</sub> *	-340.61677	23.91964	-14.24	<.0001
X <sub>10</sub> *	-182.69083	41.52533	-4.40	<.0001

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\* significant at  $p=0.01$

From the ANOVA table and the Parameter Statistics table, we can see 35.8% of the variation of the dependent variable is explained by the independent variables we have here. Most of the variables are significant at a 99% confidence level except the millage rate, the population and the acreage of the tracts.

Given more data from FIA of the ownership structure and the soil productivity levels in different counties in Georgia for the tax year of 1999, a more detailed model is able to be built, at the county level. The model is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \beta_{13} X_{13} + \beta_{14} X_{14} + \beta_{15} X_{15} + \beta_{16} X_{16}$$

Y: average tract FMV per acre in the county

X<sub>1</sub>: total acreage of the tract in the county

X<sub>2</sub>: 1999 population in the county where the tract is located

X<sub>3</sub>: population change from 1990 to 1999

X<sub>4</sub>: population growth rate from 1990 to 1999

X<sub>5</sub>: average millage rate applied in the county

X<sub>6</sub>: number of CUVA in the county

X<sub>7</sub>: if there is highway go through the county, a dummy variable with values of 0 and 1



- $X_8$ : the region the tract is located, we divided the state of Georgia into five regions according to the Forestry Inventory and Analysis (FIA) data as north, northcentral, central, southeast, and southwest.  $X_8$  equals to 1 when the tracts are located in the northcentral, otherwise it will be 0
- $X_9$ : equals to 1 when the tracts are located in the central, otherwise it will be 0
- $X_{10}$ : equals to 1 when the tracts are located in the southeast, otherwise it will be 0
- $X_{11}$ : equals to 1 when the tracts are located in the southwest, otherwise it will be 0
- $X_{12}$ : percent of lands owned by forest industry in the county
- $X_{13}$ : percent of lands owned by private corporations in the county
- $X_{14}$ : percent of lands owned by private individuals in the county
- $X_{15}$ : percent of lands that can produce more 165 cubic feet industrial wood per acre per year in the county
- $X_{16}$ : percent of lands that can produce 120 to 165 cubic feet industrial wood per acre per year in the county
- $X_{17}$ : percent of lands that can produce 85 to 120 cubic feet industrial wood per acre per year in the county
- $X_{18}$ : percent of lands that can produce 50 to 85 cubic feet industrial wood per acre per year in the county
- The results of analysis are shown in Table 5.

Table 5. Statistical summary for the county level model

<u>Analysis of Variance</u>			
Source	DF	F—value	Pr>F
Model	18	8.58	<.0001
Error	117		
Corrected Total	135		

R-Square	0.5691	Adjusted R-Square	0.5028
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<u>Parameter Statistics</u>				
Variable	Parameter Estimate	Standard Error	<i>t</i> —value	<i>p</i> —value
Intercept*	1069.79674	447.13968	2.39	0.0183
X <sub>1</sub>	-0.00085275	0.00244	-0.35	0.7272
X <sub>2</sub>	0.00066577	0.00120	0.55	0.5811
X <sub>3</sub>	-0.00579	0.00939	-0.62	0.5392
X <sub>4</sub> **	6.14856	3.41561	1.80	0.0744
X <sub>5</sub>	-9.60017	6.60912	-1.45	0.1490
X <sub>6</sub> **	0.16781	0.08564	1.96	0.0524
X <sub>7</sub>	15.75849	69.06199	0.23	0.8199
X <sub>8</sub>	-45.34394	126.83243	-0.36	0.7214
X <sub>9</sub> *	-526.23185	123.96668	-4.24	<.0001
X <sub>10</sub> *	-578.27068	133.81355	-4.32	<.0001
X <sub>11</sub> *	-550.51832	134.25595	-4.10	<.0001
X <sub>12</sub>	-0.26472	1.82346	-0.15	0.8848

X <sub>13</sub>	0.96118	2.26541	0.42	0.6721
X <sub>14</sub> *	-1.63683	0.72751	-2.25	0.0263
X <sub>15</sub>	201.95770	1861.31755	0.11	0.9138
X <sub>16</sub>	-215.80633	917.76288	-0.24	0.8145
X <sub>17</sub>	485.53139	468.78757	1.04	0.3025
X <sub>18</sub>	118.35359	459.20822	0.26	0.7971

\* significant at  $p=.05$

\*\* significant at  $p=0.1$

Since location is found to be a driving factor that influences the price of the timberland, we again use the county level model in different regions—north, central and south. The significant factors come into the model for different locations vary a lot. In the north of Georgia, none of the feasible factors is proved to be significant. The significant factors for the models in the central and southern regions are summarized in Table 6.

Table 6a. Statistical summary of the county level model in the central

<u>Analysis of Variance</u>			
Source	DF	F—value	Pr>F
Model	15	2.95	0.0056
Error	30		
Corrected Total	45		
R-Square	0.5961	Adjusted R-Square	0.3942

Statistical Summary

Significant Variables	Parameter estimate	Standard error	t-value	Pr>F
X <sub>2</sub>	0.00230	0.00125	1.84	0.0750
X <sub>3</sub>	-0.05164	0.01651	-3.13	0.0039
X <sub>4</sub>	12.51676	5.38468	2.32	0.0271
X <sub>6</sub>	0.44200	0.10943	4.04	0.0003
X <sub>7</sub>	162.98271	87.34358	1.87	0.0718

\* variables are significant at  $p = 0.1$

Table 6b. Statistical summary of the county level model in the south

Analysis of Variance

Source	DF	F—value	Pr>F
Model	15	3.09	0.0022
Error	40		
Corrected Total	55		

R-Square 0.5367    Adjusted R-Square 0.3629

Statistical Summary

Significant Variables	Parameter estimate	Standard error	t-value	Pr>F
X <sub>5</sub>	-11.85429	3.86409	-3.07	0.0039
X <sub>7</sub>	-70.49141	37.56367	-1.88	0.0679

\* variables are significant at  $p = 0.1$

### Part C. Discussion

In this study, we compared the land value and tax burden between the five southern states (Alabama, Georgia, Mississippi, North Carolina, and South Carolina). We found that land values and tax burdens in Georgia is relatively higher than its neighboring states and the tax burden variations between states are great. These variations arise as a result of the different taxation systems employed in each state. The other four states except Georgia assess industrial timberland on its current use valuation, and the value of the land is some percentage of the current use value. But for Georgia, industrial timberlands are valued at the fair market value and the tax base value is 40% of the fair market value. Thus the state of Georgia is put into a relatively disadvantageous competitive position because FMVs can be substantially higher than current use values.

With the further study of the taxation in the state of Georgia, we found that the fair market value of the timberlands is increasing as a result of development pressure. This becomes a big concern for the landowners, especially for forest products companies if they plan on continuing their forest production, because higher land values lead to higher property taxes and annual operating costs.

Another factor that put Georgia forestry into a peculiar position is its discrimination against the industrial landowners. Although the Conservation Use Valuation and Agricultural Preferential Valuation are applied in Georgia with the aim to abate the pressure of urban sprawl and alleviate the tax burden of agricultural and forest

landowners, the industrial landowners are excluded. With the current use valuation a landowner's tax burden can be relieved by more than 90% in many cases.

With the consideration of this peculiar situation of Georgia's industrial timberland, we examined the factors that influence fair market values. With the analysis of our tract level model, most of the parameters that we consider to be reasonable are proved to be significant in the deciding power of the fair market value per acre. The results are encouraging. Some of the factors, such as population growth, the existing CUVA covenants, major highway and regions, play a very significant role in predicting the FMV per acre. With a county level model, we have more factors that could be included in the model with a resulting smaller sample size. The variation of the FMV per acre is explained much more by the parameters, but the driving factor is the different locations.

Using the location as the determining factor in influencing the FMV per acre, we ran our county level model on the north, central, and south regions to see if the same factors were at work in each region. In the north, with the high pressure of urban sprawl and development, no factor was significant in explaining FMV. In the central region, population, number of the CUVA covenants, and presence of highway explain almost 50 percent of the variation of the FMV. The millage rate and highway are significantly correlated with variation of FMV per acre in the south. Thus we can see that timberlands are treated substantially differently in different region within the state of Georgia.

Based on the valuation theory, the FMV per acre should be negatively correlated to tract size, and tract size should be a significant factor influencing the FMV. It is

significant at the 0.05 significant level in the tract level model, with the correct sign, but very slightly so. In neither the county level complete model nor the regional model, is it significant. Thus our central hypothesis which is that FMV is decreasing with increasing tract size is rejected. This result further indicates a problem in Georgia's taxation systems.

The other feasible factors such as soil quality class and ownership of timberland in the county are basically insignificant in predicting the FMV per acre. This maybe is due to the dominating power of the location, but we believe further information is needed, for example the soil quality for each tract.

A meaningful comparative study of tax burden in different states is difficult to carry out, since there exist great disparities between the taxation systems in use in the United States and these disparities continue to be in disarray (Kelley, 1998). These disparities do not just exist across the sates, but also within each state. We compared the five southern states graphically and got some satisfactory information, regarding the relative disadvantage of Georgia.

Our study is the first attempt to model the factors contributing to FMV. Since FMV of the land is appraised by appraisers, different appraisers may have their different point of view, which makes the study hard to control. We believe that in order to determine the tax burden fairly, it is necessary to fully understand the full investment costs incurred by the landowners over the entire growing cycle. Thus further research is needed and caution should be taken in interpreting the results and making policy implications about our current study.

## CHAPTER 6 CONCLUSION AND POLICY IMPLICATIONS

From the comparison across the states we learn that the tax burden in Georgia is the highest among its neighboring states. The gap between Georgia and Alabama in which state the tax burden on timberland is the lowest is more than \$2.60 per acre. The FMV of timberland in Georgia is also much higher than in the other states. According to Dangerfield et al's (2000) study of tax policy and sustainable forestry in Georgia, property tax is an important discriminating factor in forest production and location decisions across the states, since the federal taxes do not vary across states and income tax differences are relatively minor. Furthermore, property taxation is well known to be a major factor in land use decisions. Thus, landowners who cannot afford the high property tax may be forced to sell the timberland. For large timber companies, they may dispose their timberland in favor of locations where the tax burden is relatively lower and more stable and their manufacturing facilities will eventually follow.

The state of Georgia is now at a competitive disadvantage in the industrial forestry sector. This situation is a result of the taxation policy in use in Georgia where the industrial timberlands are assessed by the FMV and are excluded from the CUVA and APA assessments. While in other states, industrial timberlands are treated the same as other ownerships. This discriminating policy on large industrial timberland owners may well be manifested in declining management investments in the future. Already, industrial timberland ownership is declining. According the survey of USDA Forest



Service, in the last decade, industrial timberland declined 17%. This decline is likely to continue in the future if the current policy continues.

Location is found to be an important factor in deciding FMV, not only across states but also within the state of Georgia. The results of our study show that land productivity is a negligible factor in predicting the FMV. Timber markets that land owners face in these five states are not of that different. Nevertheless, inside the state of Georgia, timberlands in the north are levied much heavier than them in the south. This is considered to be a consequence of urban sprawl. When these companies find that they cannot afford the high annual operation cost, they will be forced to sell their land and choose the south or other states as their production resource base. If this happens, the northern part of Georgia will be trapped in a vicious circle of development.

The treatment of different tract sizes should be also a concern in Georgia. Timber tracts are treated almost the same no matter whether they are 50 acres or larger than 1000 acres as long as the tracts are larger than 25 acres. Tracts in the north show greater variation than in the other regions. Mostly of the time large tracts are owned by the industrial landowners and in forest production based operation. They barely need the services of government. Thus, with the heavy tax burden, their operation cost is not compatible with the service they get. There should not only equity concerns but also the concerns for the whole forestry sector.

Though not the major topic of this study, our results do give some implications for the effectiveness of CUVA. The primary purposes of this program were to abate development pressure and aid in the provision of green space. With continuing participation, there seem to be some conservation benefits due to the heavier

participation of larger tracts. But the exclusion of industrial timberlands makes the purpose half-hearted, as whether the pressure of urban sprawl is abated is still under question. Maybe the vicious circle of sprawl is somewhat to be encouraged by this program. So, maybe the requirements for getting into this program should be relaxed and extended to improve its effectiveness.

Due to the peculiar characteristics, management of forestlands is important not only for its economic benefits but also for its environmental benefits. To some extent, the latter is much more important to the whole of society. With rising property values, forestland management is now on the margin. In order to protect Georgia's resource-based industry, a reasonable and effective property taxation system is needed. Alternatives for the current policies should be considered. An effective taxation policy on the forestland will be indicative for the taxation of other renewable resources in general.

Our last but not least concern is how should we value timberland, especially industrial timberland in Georgia. To this point, we should perhaps look around and learn from our neighboring states.

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## APPENDICES



APPENDIX A GIS MAPS

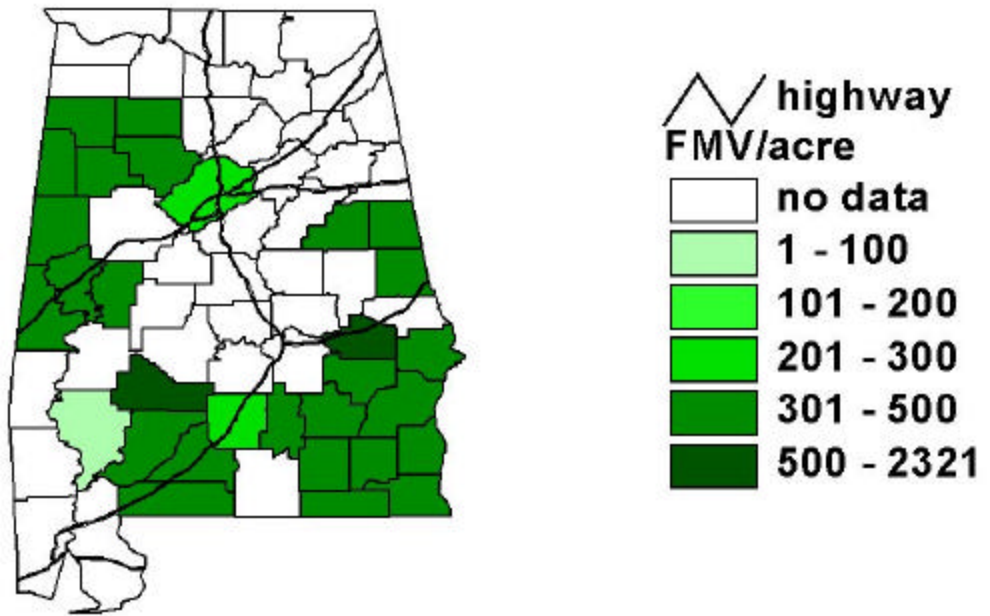


Figure Ia. GIS map of FMV/acre in Alabama

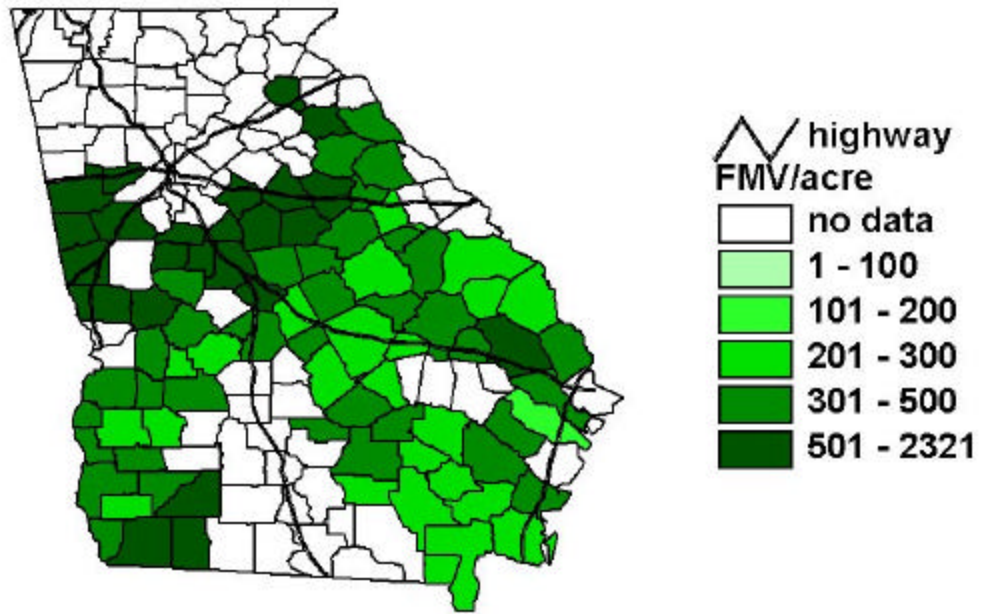


Figure Ib. GIS map of FMV/acre in Georgia

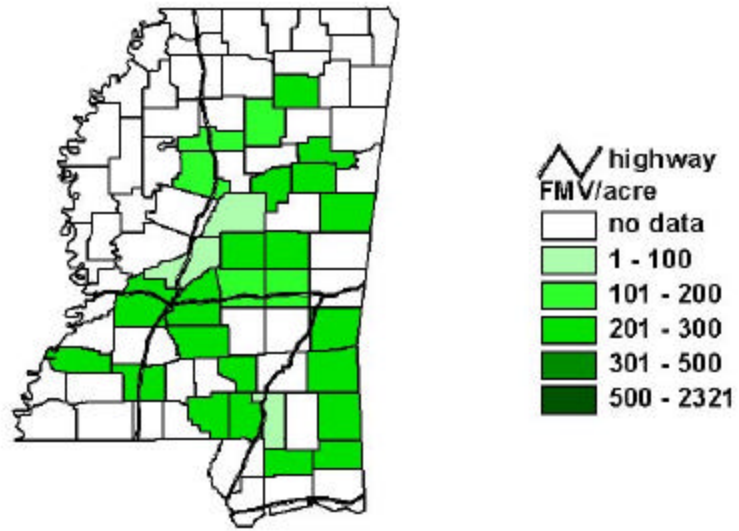


Figure 1c. GIS map of FMV/acre in Mississippi

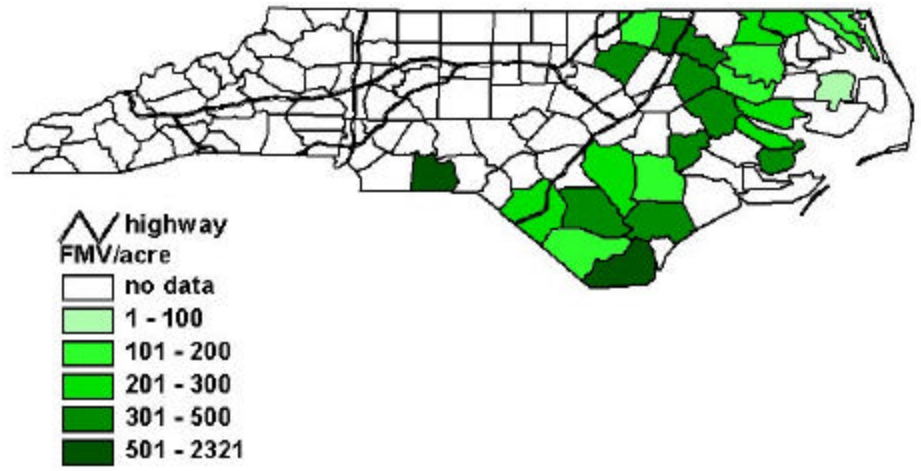


Figure Id. GIS map of FMV/acre in North Carolina

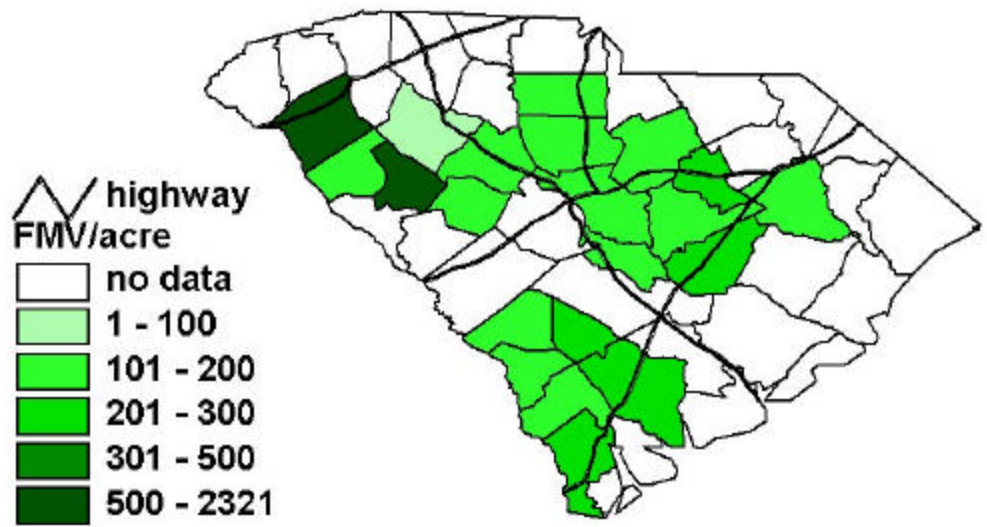


Figure 1e. GIS map of FMV/acre in South Carolina

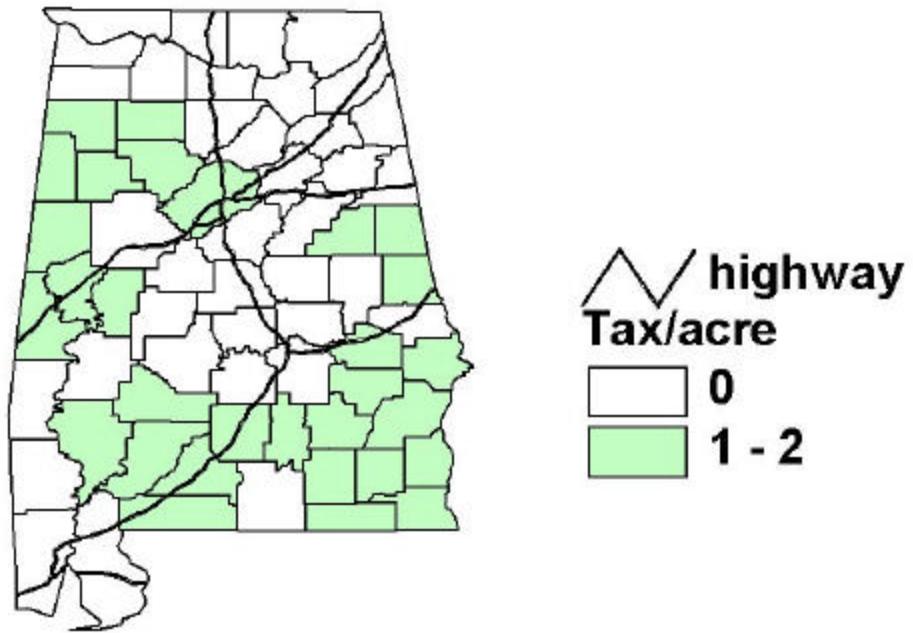


Figure IIa. GIS map of Tax/acre in Alabama

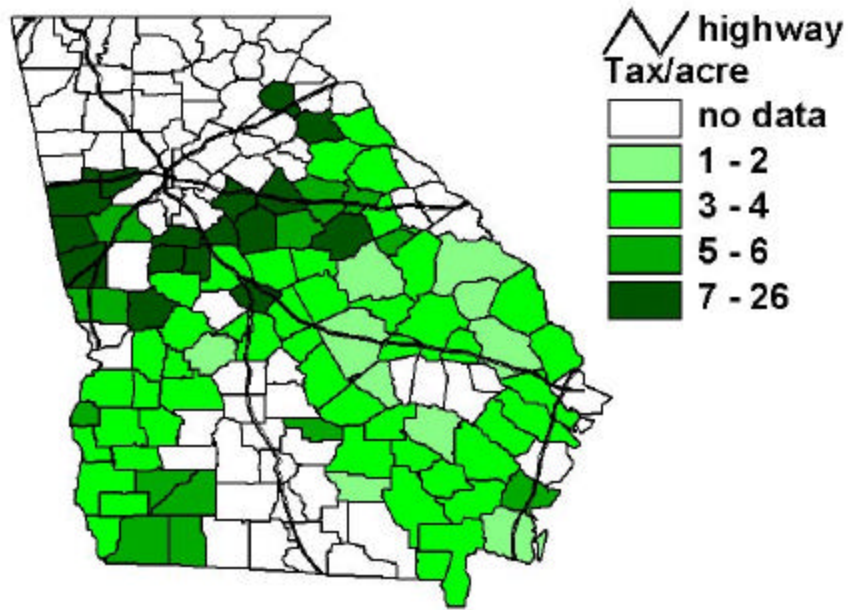


Figure IIb. GIS map of Tax/acre in Georgia

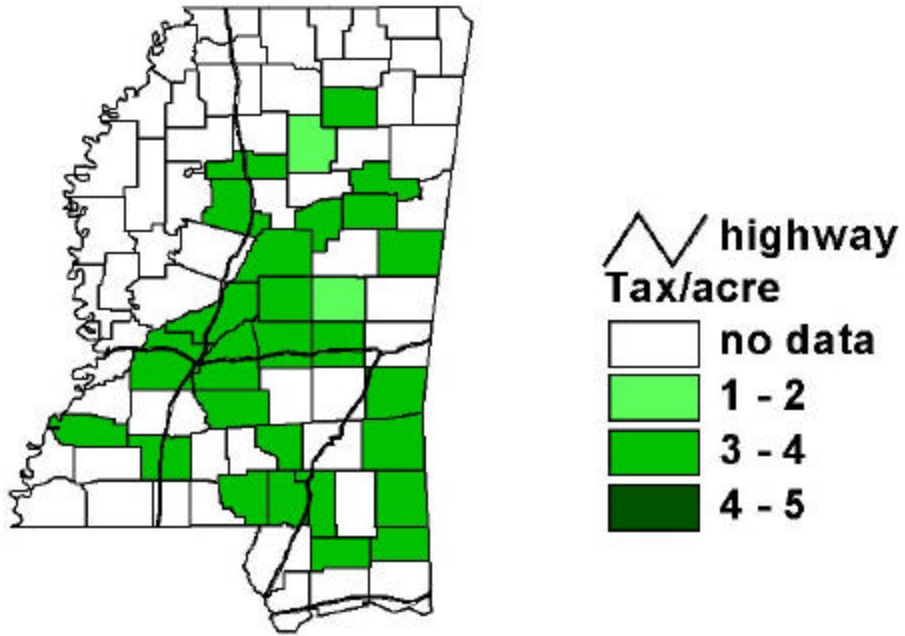


Figure IIc. GIS map of Tax/acre in Mississippi



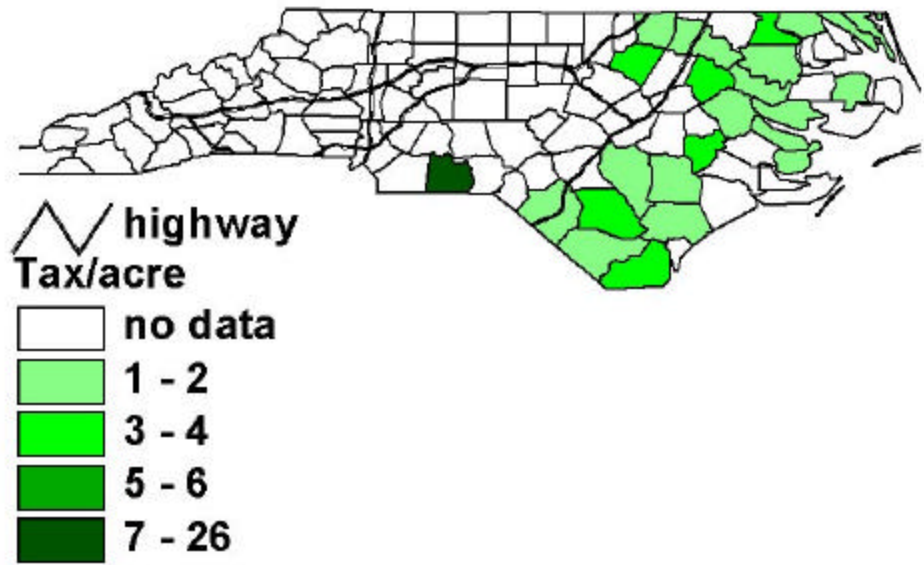


Figure IId. GIS map of Tax/acre in North Carolina

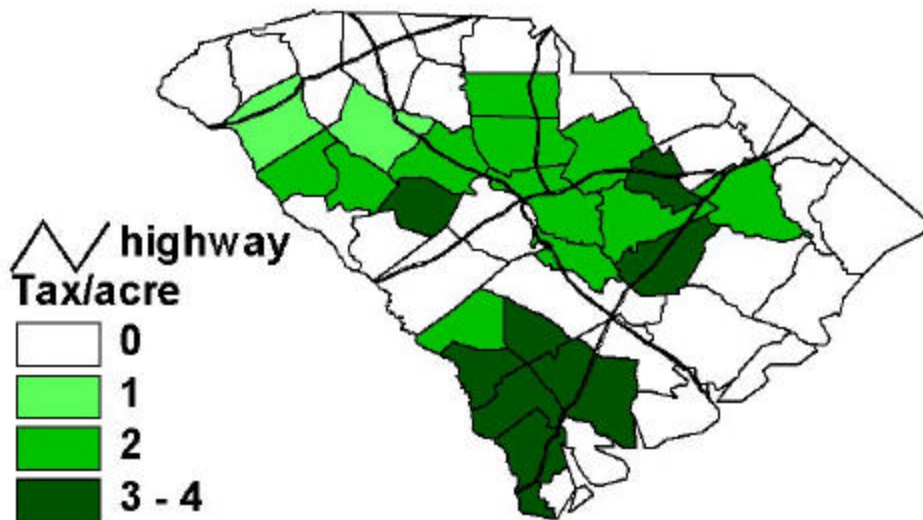


Figure IIe. GIS map of Tax/acre in South Carolina

## APPENDIX B PARAMETERS AND TREATMENTS OF THE GP SOS MODEL

### Assumptions

Site quality index	66
Rotation age	30
Real Discount Rate	6%
Ordinary Income Tax Rate	33%
Capital Gains Tax Rate	33%

### Specs and Stumpage Rate

Pulpwood	\$8.00/ton
Chip saw	\$30.00/ton
Large sawtimber	\$42.00/ton

### Site Preparation

Chemical site preparation	\$104.00/acre
HWC backpack	\$34.00/acre
Bed Pied	\$72.00/acre

### Fertilization

UREA	age 15	\$75.00/acre
UREA	age 22	\$75.00/acre

### Thinning

Twice in the rotation at age 14 and 21