Taxes and the Market for Farmland

by
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Agricultural land values are subject to several types of taxation. Earnings from land are subject to the state and federal income tax. The value of land is subject to property tax. Land is also subject to taxation at the point where a change of ownership takes place. This taxation is often referred to as capital gains taxation. Finally, land owned at the death of the owner is subject to estate taxes. Both members of Congress and the President have suggested reductions in capital gains taxation. Many states are currently considering property tax relief. Senator Lugar (R−IN) has proposed changes in estate taxation. Steve Forbes in his Presidential campaign advocated a flat tax. All of these policy proposals can have important implications for the value of land.

Taxation can affect the ownership patterns of land, in addition to the value of land. Currently, evidence suggests that instead of selling land in a normal life cycle process, some older Americans are holding land hoping to gain from capital gains taxation changes. Many of these individuals are currently in landlord−tenant relationships that have implications for the stewardship of land. Featherstone and Goodwin examined the investment in long−term conservation improvements made in Kansas. They found that farmers in rental arrangements are less likely to invest in conservation. They also found older farmers are less likely to invest in conservation than younger farmers. Based on these findings, in cases where taxation or perceived taxation benefits cause older farmers to continue farming or to enter into landlord−tenant relationships, long term conservation investment is less than it may be otherwise. In addition, the ultimate use whether agricultural or development can be influenced by tax policy.

Several studies have examined the relationship between tax policy and the farmland market. These studies have focused on capital gains taxation, marginal tax rate differences and property taxation. Adams examined the effect of income tax progressivity on valuations of assets. He concluded that individuals with higher marginal income tax rates value farmland more highly than individuals in lower tax brackets. Pederson confirms Adams' results by demonstrating that larger farms in higher tax brackets can bid more for land than smaller farmers in lower tax brackets. Pederson also suggests the favorable treatment of capital gains favors those individuals in higher tax brackets more than those in lower tax brackets.

Boehlje and Reinders state that individuals in high tax brackets can outbid those in low tax brackets in the real estate market. Boehlje and Reinders conclude the special tax treatment of capital gains, the tax deductibility of interest and the computation of the tax basis in real property affect ownership patterns and the prices of farm real estate. Specifically, they cite that a non farm investor or an established farmer can outbid beginning farmers. They also conclude that the estate transfer laws in effect at the time encouraged individuals to hold land until death.

Drummond examined the impact of property tax equalization on rural property in Oklahoma using a regression model. He found if equalization were mandated at 20 percent, the average value of rural land would decrease by 15.8 percent. Anderson and Bunch found that tax policies, such as the agricultural land retention program and/or the homestead property tax circuit−breaker, are capitalized into land value. The combined tax relief pays for 80 to 90 percent of Michigan farmers property taxes, while increasing land values less than 10 percent. Pollock and Shoup found shifting general property taxation toward site taxation can have a significant impact on the amount of capital improvements to land. Chicoine, Sonka and Doty studied the impacts of alternative types of property tax relief on Illinois farmers financial condition. They found the wealth position of current operators was increased due to increased maximum bid prices.

The purpose of this manuscript is to examine how tax policy affects agricultural land values. The paper considers property taxation, federal and state income taxation, capital gains taxation and proposed alternative tax structures (the flat tax). First, theoretical bid models are derived and discussed to provide a general basis for assessing the tax effects on land value. These theoretical models provide empirical results and testable hypotheses for land value analysis. Next, the theoretical

results are examined empirically to determine whether statistical verification of the models can be obtained. Finally, the manuscript summarizes the findings and provides implications for alternative tax policy.

Theoretical Evidence

The land owner is assumed to maximize the discounted values of net benefits flowing from the land. Land values will be determined at the point where the net present value of land is equal to zero, in that all economic rents will be bid out of the system, assuming a perfectly competitive land market (Ricardo). The net present value of land is made up of three distinct components. The first is the purchase price of land. The second is the value of the returns from land operation. The third factor is the discounted value of the net sale value. Without taxation, the net present value of a land investment is determined by:

(1)

$$NPV = -P + \sum_{t=1}^{T} A_t(1+i)^{-t} + TV(1+i)^{-T}$$

where NPV is the net present value, P is the purchase price, A_t is the return from land for year t, T is the length of the holding period, TV is the terminal value and i is the interest rate. The maximum bid price for a land buyer can be found by setting the net present value equal to zero. Rearranging equation (1) results in:

(2)

$$P = \sum_{t=1}^{T} A_t(1+i)^{-t} + TV(1+i)^{-T}.$$

The above model depends on the terminal value assumed. Under growth assumptions, the terminal value can be rewritten as a function of the purchase price of land and a growth rate in cash rents. Assuming a constant nominal growth rate g which is equal to one plus the real growth rate times one plus the inflation rate, minus one, the maximum bid model can be written as:

(3)

$$P = \sum_{t=1}^{T} A_t(1+g)^t(1+i)^{-t} + P(1+g)^T(1+i)^{-T}.$$

The first term on the right is the present value of the returns while the second term is the present value of the sales price of land. Under growth, the land value will increase at the same rate as the growth in cash rents (Dobbins and Baker). Thus, the terminal value of land (TV) is equal to the purchase price increased by the growth rate in land for the length of the holding period. Resolving (3) to isolate the purchase price results in:

(4)

$$P - P(1+g)^T(1+i)^{-T} = \sum_{t=1}^{T} A_t(1+g)^t(1+i)^{-t},$$

Letting $1+i^*$ equal (1+i)/(1+g) and using the present value of an annuity formula for the numerator results in:

(6) (5)

$$P = \frac{A^0(1-(1+i^*)^{-T})}{i^*(1-(1+i^*)^{-T})} = \frac{A^0}{i^*} = \frac{A^0(1+g)}{i-g}$$

$$P = \frac{\sum_{t=1}^{T} A_t(1+g)^t(1+i)^{-t}}{1-(1+g)^T(1+i)^{-T}}.$$

where A_0 is the expected return (net of costs) to the land at time zero. Equation (6) is referred to as the appraisal formula or as the growth stock formula. It is useful to note that without taxes, the results are not dependent on the holding period.

Incorporating Income Taxation and Capital Gains

Under the scenario of income taxation and capital gains, the net present value of land is determined by the following:

(7)

$$NPV = -P + \sum_{t=1}^{T}(1-m)A_t(1+g)^t(1+r)^{-t} + (P(1+g)^T - m(P(1+g)^T - P))(1+r)^{-T}$$

where m is the marginal tax rate on income and r is the after−tax interest rate. The after−tax interest rate is determined by taking the pretax interest rate and multiplying it by one minus the marginal tax rate. This adjustment accounts for the tax deductibility of interest rates for business income. The first term on the right−hand−side of equation (7) is the purchase price. The second term is the present value of the after−tax returns on the rental income. The final term in equation (7) is the discounted value of the after−tax sales price. Capital gains are determined by taking the sales price minus the purchase price times the marginal tax rate. This tax value is subtracted from the sales price and discounted to its present value.

Setting the NPV, defined in equation (7), equal to zero and solving for the maximum bid price results in:

(8)

$$P = \frac{A^0(1-m)(1-(1+r^*)^{-T})}{r^*((1-m)(1-(1+r^*)^{-T}))+m(1-(1+r)^{-T}))}$$

where each of the terms is defined as above. Notice that the formula A_0/r^* is multiplied by a formula representing the effects of taxation on land value. Thus, a wedge (distortion) has been driven into the land market due to the taxes in two ways. The first is the use of an after−tax interest rate (r^*) instead of a pretax interest rate (i^*). The second is the tax effect due to the use of a constant tax basis for capital gains taxation purposes illustrated by the term $m(1-(1+r)^{-T})$ in the denominator. The term in the denominator increases as the marginal tax rate increases. Thus, investors who are in a higher marginal tax rate are able to bid more for land than investors who are in a lower marginal tax rate (Boehlje and Reinders).

Incorporating Property Taxes

The above discussion provided a pricing model that examined the effect of income and capital gains taxation on land values. In addition to this type of taxation, land values are often subject to property taxes. Property tax is calculated using many different methods. Two of the more common methods for taxing property include use value and market value. Robison and Koenig discuss a valuation model in cases where the market value diverges from the agricultural use value of farmland. They conclude that the value could be expressed as the value of the agricultural use plus the value of the nonagricultural use. To simplify the discussion of the inclusion of property taxes into the model, it is assumed that the

nonagricultural value of land−use is zero. The net present value of land with the inclusion of property taxes is:

(9)

$$NPV = -P + \sum_{t=1}^{T} (1-m)(A_t - pP)(1+g)^t(1+r)^{-t} + (P(1+g)^T - m(P(1+g)^T - P))(1+r)^{-T}$$

where p is the percentage rate of taxation. Notice that the property tax reduces the net present value of returns by the property taxation rate multiplied by the value of land. If the market value of land were diverging from the agricultural use value, the property taxation rate would only be multiplied by the value of land from an agricultural use perspective.

Setting the NPV, defined in equation (9), equal to zero and solving for the maximum bid price results in:

(10)

$$P = \frac{A^0(1-m)((1-(1+r^*)^{-T})}{r^*((1-m)(1-(1+r^*)^{-T}))+m(1-(1+r)^{-T})) + p(1-m)(1-(1+r^*)^{-T})}$$

where each of the terms is defined as above. Property taxes further drive a wedge between the value of land without property taxes and the value with property taxes. In this case, the denominator is larger with the use of property taxes, causing the value of land to be less than it would be in the absence of property taxes.

Equation (10) represents the bid model for farmland for many agriculture−dependent states under current tax legislation. However, many changes are currently being proposed to the tax system. Some of these proposals can be easily analyzed using the bid model framework. For example, a shift in property tax rates to income tax rates could be examined by adjusting p and m in equation (10). However, several policy changes would fundamentally alter the maximum bid models. Thus, to fully anticipate changes on the farmland market, it is important to consider these changes.

Capital Gains Changes

Changes in the treatment of capital gains are being proposed by both Democrats and Republicans. The 104th Congress passed two capital gains bills. One bill, passed in the U.S. Senate, provided a 50 percent capital gains exclusion. The other, passed by the U.S. House of Representatives, taxed only the real gain on any investment. This section will first examine the implications of the capital gains exclusion (Senate Bill), and then the implications of taxing only real capital gains (House Bill) on farmland.

Capital Gains Exclusion

The Senate bill passed by the 104th Congress provided for a 50 percent capital gains exclusion on capital gains. If farmland purchasers expected the law to be effective when they were selling out of their investment, the NPV of a land purchase would be:

(11)

$$NPV = -P + \sum_{t=1}^{T} (1-m)(A_t - pP)(1+g)^t(1+r)^{-t} + (P(1+g)^T - cm(P(1+g)^T - P))(1+r)^{-T}$$

where c is one minus the capital gains exclusions. The capital gains exclusion directly affects the after−tax discounted value of the terminal value at the time in which a sale is made. Proposals that farmland purchasers do not expect to be in effect when the land would be sold would have little effect on the farmland market from a buyer's perspective. Essentially, c would be one in equation (11), which would cause land to be valued the same as in equation (10). For example, land developers looking at a piece of farmland may have a shorter holding period than a farmer may. If those individuals had different expectations regarding the value of c, the individual with the shorter holding

period would place a higher value on it than the individual with a longer holding period and would likely own the land. Assuming market participants expect the capital gains exclusion to be available in the future, the maximum bid price for a parcel of land is:

(12)

$$P = \frac{A^0(1-m)((1-(1+r^*)^{-T})}{r^*((1-cm)(1-(1+r^*)^{-T}))+cm(1-(1+r)^{-T})) + p(1-m)(1-(1+r^*)^{-T})}$$

where each of the terms is defined as above. The capital gains exclusion will reduce the denominator and therefore increase the value of farmland. In a case where the capital gains exclusion was 100 percent, equation (12) would simplify to:

(13)

$$P = \frac{A^0(1-m)}{r^* + p(1-m)} .$$

Under some of the Democratic proposals, capital gains for those individuals below a certain threshold of wealth could be excluded from income. Those individuals expecting to be under the level of excluded income at the end of the investment would bid for land according to equation (13).

Taxing Real Capital Gains

Under a capital gains law in which only real capital gains are taxed, the net present value for land would be:

(14)

$$NPV = -P + \sum_{t=1}^{T}(1-m)(A_t - pP)(1+g)^t(1+r)^{-t} + (P(1+g)^T - m(P(1+g)^T - P(1+I)^T))(1+r)^{-T}$$

where I is the inflation rate in the economy. The tax basis is inflated at the rate of inflation in the overall economy, thereby only creating a tax liability on those increases in land price that are greater than the rate of inflation. The inflation index that has been proposed in some legislation is the GDP deflator. Setting the NPV in (14) equal to zero and solving for the maximum bid price results in:

(15)

$$P = \frac{A^0(1-m)((1-(1+r^*)^{-T})}{r^*((1-m)(1-(1+r^*)^{-T}))+m(1-\left[\frac{(1+r)}{(1+I)}\right]^{-T})) + p(1-m)(1-(1+r^*)^{-T})}$$

where each of the terms is defined as above. The updating of the tax basis by the inflation rate will reduce the denominator and therefore increase the value of farmland. In the case where the inflation rate was equal to the nominal growth rate (real growth in cash rents equal to zero), the maximum bid price for land will simplify to:

(16)

$$P = \frac{A^0(1-m)}{r^* + p(1-m)}$$

which is equal to equation (13). Thus, the House proposal of only taxing real capital gains under no real growth in cash rental rates converges to the Senate proposal under a 100 percent capital gains exclusion.

The Flat Tax

Several alternative tax proposals such as the Flat tax, the USA tax and the National Sales tax have been proposed to replace the current tax system. These alternative proposals could substantially alter the way capital assets are priced. To illustrate how changes in the tax code could affect the pricing of land, consider the flat tax proposal. The flat tax proposal would allow for land to be deducted from income at the time of purchase. At the time of sale, land would be fully taxed at the flat tax rate. Although the language of H.R. 2060 by Representative Richard Armey (R−TX) introduced to the 104th Congress is not clear on the deductibility of property taxes, it is assumed for this analysis that property tax is a deductible expense. The net present value of a farmland investment under a flat tax would be:

(17)

$$NPV = -P(1-m) + \sum_{t=1}^{T}(1-m)(A_t - pP)(1+g)^t(1+r)^{-t} + (1-m)P(1+g)^T(1+r)^{-T}$$

where the variables are defined as above. Setting the NPV equal to zero and solving for the maximum bid price results in:

(18)

$$P = \frac{A^0(1-m)((1-(1+r^*)^{-T})}{r^*((1-m)(1-(1+r^*)^{-T})) + p(1-m)(1-(1+r^*)^{-T})}$$

where each of the terms is defined as above. Equation 18 can be further simplified to:

(19)

$$P = \frac{A^0}{r^* + p}.$$

Under the flat tax, the marginal tax rate no longer enters the equation. Thus, the taxation of income no longer distorts the investment process. Differences in the property tax (p) can still cause distortions within and across states.

Empirical Evidence

The previous section has provided a general discussion of the effects of taxation on the value of farmland. This section will take these results and provide quantitative estimates regarding the size of the effects under alternative tax policies. The following assumptions provide the base maximum bid value under current tax policy. The current income (cash rent) is $35 per acre, which was the average rent per acre in Kansas during 1995 (USDA 1996a). It is assumed the nominal pretax interest rate is 9 percent which is near the average real estate loan rate quoted in Walravan and Carson. It is assumed the average inflation rate is 3 percent. Three percent to 4 percent of farmland changes hands each year. Thus, a holding period is assumed to equal 30 years. The average property tax rate is assumed to be 0.75 percent, which is the average rate in the United States during 1994 (USDA 1996c). It is also assumed that the real growth rate in land rents is equal to zero. Assuming a federal marginal income tax rate of 28 percent and a state income tax rate of 6 percent, the maximum bid price for land (equation 10) is $611 per acre.

The second column of Table 1 presents quantitative analysis regarding the maximum bid price under various assumptions. Those farmers with lower marginal tax rates can bid less for farmland than can those individuals with higher marginal tax rates. An individual with an 18 (15 percent federal and 3 percent state) percent marginal income tax rate can bid only 93.1 percent as much as an individual with a 34 percent marginal tax rate. Those individuals in high property tax rate states can pay less for farmland than those in lower property tax states. An increase in the property tax rate from 0.75 percent to 1 percent will decrease the maximum bid price by 4.3 percent. Those individuals with shorter holding periods will bid less for land than those with longer holding periods. Increasing the holding period from 30 years to 40 years increases the bid price by 2.9 percent. Finally, a decrease in

the pretax interest rate from 9 percent to 8 percent holding inflation constant at 3 percent, causes land values to increase by 18.6 percent.

Capital Gains Analysis

The above analysis focuses on the maximum bid analysis. Before examining the effect of capital gains legislation, it is important to consider whether capital gains have had an effect under previous law. Rearranging equation 12 to solve for the rent to value ratio and using a general functional form, the rent to value ratio can be expressed as:

(20)

$$\frac{A_0}{P} = f(c,\ m,\ r*,\ r,\ T,\ p)$$

where the variables are defined above. To examine whether capital gains changes are incorporated into the farmland market, the following equation was estimated:

(21)

$$\frac{A_0}{P} = a_0 + b_1 C + b_2 r* + b_3\left[\frac{A_0}{P}\right]_{t-1} + e$$

where a_0, b_1, b_2 and b_3 are parameters to be estimated. Data on the rent to value ratio from 1960 through 1993 was obtained from the Mann library at Cornell University over the Internet. This data is regularly published by USDA in various sources. The rent−to−value ratios for South Dakota, North Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, Illinois, Michigan, Indiana and Ohio were used. Data did not exist for South Dakota for 1991 and for Kansas and Nebraska from 1960 through 1968. Data on farm borrowing rates were obtained from Walravan and Carson and previous issues. These data were converted to real rates using the annual percentage change in the personal consumption expenditures component of the implicit GNP deflator obtained from various issues of the *Economic Report of the President*. The capital gains variable was a binary variable which was equal to one after 1986 and equal to zero prior to and during 1986. The tax reform act of 1986 ended the exclusion for capital gains. The lagged value of the cash rental value is included to account for the dynamic process in expectation formulation and the remaining unobserved variables. The expected sign on b1 is negative and positive for b2 and b3.

The estimated coefficients for equation (21) are:

(22)

$$\frac{A_0}{P} = -.18674 - .20956C + .073568r* + .982309\left[\frac{A_0}{P}\right]_{t-1} + e$$

where the standard errors are .064212, .00925 and .02135 on the b coefficients, respectively. Each of the parameter estimates are significant at the 5 percent level with the expected sign. The R−squared for the equation is .8694. Given the significant coefficient of −0.20956 on the capital gains variable, it can be concluded that capital gains legislation appeared to be bid into the land market in accordance with theory.

Capital Gains Exclusion

Table 1 also presents the current maximum bid price for land under various assumptions under the current law (equation 10), the gains exclusion (equation 12) and the real capital gains exclusion (equation 15). Table 1 assumes any changes in tax law are assumed to be permanent. It also ignores any short−run effects in the land market. The values in Table 1 are partial equilibrium values. To the extent that tax law changes have major effects in the macro economy, the effects estimated in Table 1 could be magnified or muted.

Under the base case, a 50 percent capital gains exclusion would result in an increase in land value from $611 to $648 per acre under the base assumptions. This represents a 6.0 percent increase in land values. Those individuals with lower marginal tax rates would benefit substantially less in that those individuals with a combined marginal income tax rate of 18 percent would see an increase of 1.75 percent in their maximum bid price. The rate of property taxation affects the percent increase in land value as the increase would be 5.8 percent in states with a 1 percent property tax levy and 6.4 percent in states with a 0.5 percent property tax levy. A capital gains exclusion is less valuable in percentage terms if the holding period increases from 30 to 40 years. This places those individuals that would want to hold land for five years and then develop it in a much better competitive position when compared to current tax law. The capital gains exclusion is larger in percentage terms if the real interest rate is lower. A decrease in the pretax interest rate from 9 percent to 8 percent under 3 percent inflation increases the increase in land price from 6.1 percent to 8.1 percent.

If a combination policy were used where a full capital gains exclusion was given to those in lower tax brackets, with no exclusion for those in the higher tax brackets, it would result in a maximum bid price of $590 per acre for the individual in an 18 percent tax bracket and a maximum bid price of $611 for the individual in the 34 percent tax bracket. This would increase the individual in the lower tax bracket from 93.1 percent to 96.6 percent of that of the higher tax bracket and reduce the competitive advantage of those individuals in higher tax brackets.

Taxing Real Capital Gains

Taxation of only real capital gains provides a larger boost in land values than a 50 percent capital gains exclusion (Table 1). Under the base assumptions, taxing only real capital gains increases the land value by 12.8 percent compared to 6.1 percent under the capital gains exclusion. The same general trends exist for taxing real capital gains as for the 50 percent exclusion except the percentage effect is larger. That is, individuals with lower marginal tax brackets are placed at a larger competitive disadvantage, individuals with longer holding periods benefit relatively less and individuals in higher property tax states benefit relatively less. The maximum bid price is the same regardless of the holding period if only real capital gains are taxed. In a lower interest rate environment, taxation of only real capital gains provides a larger benefit than the current law.

The Flat Tax

The effect of land values under the flat tax is more difficult to analyze. The total effects of a flat tax cannot be determined solely by changing the tax rate faced by an individual or firm and recalculating their tax liability. A flat tax does not tax interest earnings nor does it allow for a deduction of interest expense. This represents a major change from the current treatment of interest. Understanding the difference between pretax and after−tax interest rates can provide some insight on potential interest rate changes under a flat tax. A comparison of the average interest rate earned on Moody's Aaa rate state and local bonds, which are tax exempt and Moody's Aaa rated corporate bonds, which are taxable can illustrate how taxes affect interest rates.

Table 2 provides a historical comparison between the state and local bonds and corporate bonds. Since both bonds are rated Aaa, they are in roughly the same risk and return class. In fact, the Moody's manuals list verbatim the classification guidelines for these bonds. The major difference between these bonds is that earnings on the state and local bonds are tax exempt and that governmental agencies do not get a deduction for interest paid since they are tax exempt. Corporate bond earnings are taxable and the interest paid on those bonds are tax deductible by the corporation. Multiplying the corporate bond rate by the implied tax rate yields the tax on earnings, which when subtracted from the corporate bond rate equals the state and local bond rate. Thus, an investor with the implied marginal tax rate will be indifferent between investing in a corporate bond or a state and local bond.

The average Moody's state and local bond rate over the last 16−year period was 7.57 percent (Table 2). The average Moody's corporate bond rate during the same 16−year period was 10.15 percent, thus the average implied tax rate was 25.33 percent. These relationships provide a snapshot as to the indication of the change in interest rates if they were no longer deductible from a business perspective or taxable from a bondholder perspective. Because the state and municipal bond rates are already non−taxable and nondeductible, some have argued it is likely that interest rates would decline by roughly 25 percent under a flat tax. John Golob, an economist with the Kansas City Federal Reserve

Bank, estimates that the elimination of the taxation of interest could cause interest rates to drop between 25 percent and 35 percent. With the consideration of what he calls "secondary factors," he suggests that the drop would likely be closer to 25 percent than 35 percent. To examine the effect of a 20 percent flat tax (Armey's proposed initial rate), three interest rate scenarios will be examined, a 0 percent change in the pretax interest rate, a 12.5 percent drop in the pretax interest rate and a 25 percent drop in the pretax interest rate.

Table 3 presents the differences in the maximum bid price under the alternative interest rate scenarios. The effect a flat tax will have on land values critically depends on what happens to pretax interest rates. Land values could change by −12.9 percent, 4.4 percent or 30.4 percent depending on whether pretax interest rates stay the same or fall by 12.5 percent or 25 percent respectively. The value of land only depends on the level of property tax and the expected real growth rate in land rents. The land is invariant to differences in state income tax rates and the holding period. Thus, different market participants are more likely to have equal access to the land markets.

Estate and Gift Taxes

Estate and gift taxes can also affect land ownership patterns. During calendar year 1995, estate and gift taxes raised $15 billion (Internal Revenue Service). Current law exempts, $600,000 worth of property from the taxable estate. Above $600,000, estates are taxed at marginal rates ranging from 37 percent to 55 percent (McEowen and Harl). The January 1, 1996 average value of farmland in Illinois was $2,064 per acre (USDA 1996b). Thus, a farmer can pass 290.7 acres onto the heirs without tax.

The average farm size in Illinois from the *1992 Census of Agriculture* was 351 acres (U.S. Department of Commerce). If this farm is owned free of debt at the time of death, the estate tax liability would equal $46,052. Converted into acres, this tax represents 22 acres or 6.3 percent of the land area (Table 4). A farmer that owned 500 acres at the time of death, would have an estate tax liability of $166,120 representing 81 acres or 16.2 percent of the land area. Approximately 25 percent of Illinois farms (18,827) were larger than 500 acres (Census of Agriculture). As the number of owned acres increases, the financial condition of the farm could change drastically due to estate taxes. Considering a 2,000 acre farm, 41.7 percent of the land would need to be sold to pay the estate taxes. If the heir decided instead to borrow the money to pay the tax, the debt to asset ratio of that farm would increase from zero to 41.7 percent. The additional leverage borne by the farm increases the probability of financial distress which could ultimately result in the need to sell a portion of the farm and a change in ownership of the land.

Summary and Conclusions

This study examines the effect of taxation on land values. Under current law, land values are affected by the method of capital gains taxation, the level of property tax, the returns to land, the pretax interest rate, the inflation rate, expected real growth in returns, the expected holding period and the marginal tax rate. This study has derived maximum bid models for land under the current law, under alternative forms of capital gains taxation and under an alternative tax structure. Tax structures to some degree or another place different market participants at substantial advantages or disadvantages when bidding for farmland. These differences can have an effect on the distribution of farmland ownership. These ownership patterns have implications for the long−run structure of agriculture and even for the incentives individuals have for investment in conservation practices. The results of this study suggest that a capital gains exclusion and the taxation of real capital gains will increase the disparity of ownership patterns between individuals in different tax brackets. Whether or not this is desirable, depends upon how they will treat the land. The flat tax proposal removes some of those distortions and allows market participants to value land similarly. In addition, a limited capital gains treatment for those individuals that are in lower tax brackets could put those individuals on a more level footing. Table 1. Maximum Bid Prices for Land Under Various Assumptions1

Table 1. Maximum Bid Prices for Land Under Various Assumptions[1]

Assumptions	Current Law	Gains Exclusion	Real Capital Gains
Base Assumptions	$611	$648	$690

18% Marginal Tax Rate	569	579	590
0.5% Property Tax	639	680	725
1% Property Tax	585	619	657
40−year Holding Period	629	658	690
0.5% Real Growth	690	747	784
8% Pre−Tax Interest Rate	725	784	853

[1] The base assumptions are a $35 per acre rent, a marginal pre−tax interest rate of 9 percent, a 3 percent inflation rate, a 0.75 percent property tax rate, a 30−year land holding period and a 34 percent state and federal marginal income tax rate. It is also assumed that there is no real growth in cash rents.
Table 2. Historical Moody's Aaa State and Local Bond and Corporate Bond Averages.

Table 2. Historical Moody's Aaa State and Local Bond and Corporate Bond Averages.

Year	State and Local Bonds (%)	Corporate Bonds (%)	Implied Tax Rate (%)
1980	7.85	11.94	34.25
1981	10.43	14.17	26.39
1982	10.88	13.79	21.10
1983	8.80	12.04	26.91
1984	9.61	12.71	24.39
1985	8.60	11.37	24.36
1986	6.95	9.02	22.95
1987	7.14	9.38	23.88
1988	7.36	9.71	24.20
1989	7.00	9.26	24.41
1990	6.96	9.32	25.32
1991	6.56	8.77	25.20
1992	6.09	8.14	25.18
1993	5.38	7.22	25.48
1994	5.77	7.97	27.60
1995	5.80	7.59	23.58
Arithmetic Mean	7.57	10.15	25.33

Source: Federal Reserve Bulletin, Various Issues

Table 3. Maximum Bid Prices for Land Under a Flat Tax and Under Various Other Assumptions[1]

	Percent Decline in Pretax Interest Rates		
Assumptions	0 Percent	12.5 Percent	25 Percent

Base Assumptions	$532	$638	$797
0.5% Property Tax	579	669	845
1% Property Tax	512	610	754
40−year Holding Period	532	638	797
0.5% Real Growth	578	705	903

[1] The base assumptions are a $35 per acre rent, a base pre−tax interest rate of 9 percent, a 3 percent inflation rate, a 0.75 percent property tax rate, a 30−year land holding period. It is also assumed that there is no real growth in cash rents.

Table 4. Estate Tax Liability for Illinois Farmers For Various Farm Sizes (Land Only)

Land Acreage	Estate Tax	Acres Sold to Pay Tax	Percent of Farm
351	$46,052	22	6.3
500	166,120	81	16.2
1,000	619,360	300	30.0
1,500	1,150,800	558	37.2
2,000	1,718,400	833	41.7
2,500	2,286,000	1,108	44.3

This example assumes the average value per acre is $2,064. It is also assumed that all land is owned at the time of death.

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