HEDONIC VALUATION OF COTTON BASE ACREAGE IN LOUISIANA

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Abstract

Recent changes in domestic agricultural policies indicate that the value of cotton base acreage will decline with the seven-year phase out of government payment programs for basic commodities. Results presented in this paper illustrate that the effect of these declines on enrolled land values will vary by cotton production area within Louisiana.

Introduction

Reform of domestic agricultural policies resulting from the Federal Agriculture Improvement and Reform (FAIR) Act of 1996 emphasizes the need for research on the extent of capitalization of agricultural program benefits into the value of rural land. Theoretically, the value of crop base acreage for commodities will decline with the seven-year phase out of government programs mandated by the FAIR Act. While agricultural land values are affected by several factors (commodity prices, distance to input and output markets, soil quality, etc.), declines in the size of production flexibility contract payments will have detrimental effects on the value of enrolled acreage.

Including feed grains, upland cotton, and rice, government program enrollment totals more than 2.6 million acres in Louisiana. Upland cotton base accounts for 1,024,035 acres, or 38 percent, of total government enrolled acreage in Louisiana (USDA, 1994). The extensive enrollment of Louisiana agricultural land as cotton base acreage suggests a need to estimate the capitalized effects of cotton base acreage on the value of rural land containing such income supports.

Louisiana cotton production is largely limited to three distinct geographic production areas within the state. These areas include the Red River, North Delta, and Central Delta (Figure 1). The objective of this paper is to present and illustrate the variation in the estimated capitalized land value of the government income support for cotton by geographic production area in Louisiana, prior to the implementation of the FAIR Act.

Data

The study is based on 385 sales of agricultural real estate occurring in the Red River, North Delta, and Central Delta areas of Louisiana between January 1, 1993 and June 30, 1994. The data were collected using the 1994 Louisiana Rural Land Market Survey and a statewide listing of individuals with knowledge of Louisiana rural land markets. Geo-referencing the location of each tract of rural land with a geographic information system (GIS) allowed hedonic modeling efforts to include spatial variables, such as general soil types and distance to input and output markets, in addition to a discrete variable for tracts containing land enrolled as cotton base acreage. Other variables used in the analysis included size of tract, percent cropland, percent pastureland, percent timberland, value of improvements, amount of road frontage, percent of mineral rights conveyed, paved road access, reasons for purchase, the presence of rice base acreage, and the general soil classification.

Procedures

Following the approach used by Danielson (1984), a transcendental hedonic function was specified for each cotton production area identified in this study:

$$\text{Price} = \beta_0\, Z_1^{\beta_1}\, \exp\,[\, \textstyle\sum \alpha_i X_i + \sum \gamma_j D_j + \epsilon\,], \qquad (1)$$

where Price is the per acre price of land, Z_1 is the size of tract in acres, X_i are additional continuous variables, D_j are discrete (dummy) variables, and ϵ is a random disturbance term. Taking the natural logarithm of both sides of equation (1) gives:

$$\ln \text{Price} = \ln \beta_0 + \beta_1 \ln Z_1 + \textstyle\sum \alpha_i X_i + \sum \gamma_j D_j + \epsilon. \qquad (2)$$

Because the price of land is hypothesized to decline as the size of tract (Z_1) increases, but at a decreasing rate, nonlinearities were incorporated for Z_1. Therefore, β_1 is hypothesized to be negative, although the specification allows it to be negative or positive.

The implicit marginal price of each characteristic is an estimate of the amount by which the per acre land price changes, given a unit change in the characteristic. For all except the discrete variables in equation (2), the implicit marginal prices (i.e., the partial derivatives) are given by the following:

$$\partial \text{Price}_t / \partial Z_{1,t} = \text{IMPSIZE}_{1,t} = [\, \beta_1 / Z_{1,t}\,] \times \text{Price}_t$$
$$\partial \text{Price}_t / \partial X_i = \text{IMPX}_{i,t} = \alpha_i \times \text{Price}_t. \qquad (3)$$

The subscript, t, implies that there are implicit marginal prices associated with each land transaction. An estimate of the implicit marginal price at the mean price and mean level

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of characteristic over all observations is obtained by substituting mean values of each variable in equation (3).

The derivation of implicit prices for discrete variables (D_j) in semilogarithmic equations is not as straightforward. Kennedy (1981) suggests the following estimation procedure where the variance of the coefficient of the discrete variable is taken into account:

$$IMPD_j = (\exp [c_j - 1/2 V(c_j)] - 1) \times \text{Mean Price}, \quad (4)$$

where $IMPD_j$ is the implicit price of the discrete variable, c_j is the estimated coefficient of the discrete variable parameter, D_j; $V(c_j)$ is the variance of the estimated coefficient, c_j; and Mean Price is the mean price per acre over all observations used in the model. Taking $V(c_j)$ into account can lead to less bias in the estimate when the variance of c_j is substantial.

Although equation (3) estimates the implicit marginal prices associated with tract-specific characteristics, a second-stage estimation is required to include non tract-specific influences such as income, population density, and other socioeconomic characteristics. Such second-stage estimations can be performed for all continuous variables in equation (2). However, since the focus of this paper is the estimated implicit marginal price of a discrete variable for the presence of cotton base acreage, results presented are limited to the first-stage analysis.

Variables Used in Estimations

Variables used in the estimation of the hedonic pricing models and their expected signs are presented in Table 1. Because each cotton production area identified is different with respect to characteristics modeled, each model used only those variables listed in Table 1 that were relevant to each respective submarket area. The dependent variable used in the first-stage hedonic model (PRICE) reflects the per acre selling price for each tract of rural land, including all improvements.

Tract size (SIZE) is a key physical characteristic that is expected to influence the selling price of rural land. Because a larger tract of rural land often has a higher total value than a smaller tract, the number of potential buyers was expected to be reduced. Previous rural land research suggests that the size of tract reflects a curvilinear relationship, with value per acre decreasing at a decreasing rate as tract size increases. Therefore, SIZE was expected to have an inverse relationship to the per acre price and entered the hedonic equation in a nonlinear form.

The proportion of land in a tract devoted to cultivation (CROP) is a physical characteristic that is expected to have a positive influence on per acre land values. Because cultivated land represents an intensive use, it may be priced at a premium over less developed rural land. Similarly, the proportion of land devoted to pasture (PAST) may also contribute to rural land values, depending on the extent of improvement.

Other physical characteristics expected to positively influence rural land values included the value of improvements (VALUE) and the amount of road frontage the tract contains (ROADFT). The value of improvements reflected the dollar valuation made by the survey respondent for any improvement made on or to the tract, including buildings, barns, fences, irrigation equipment, etc. The amount of road frontage was expected to reflect development potential and accessibility. Because mineral rights represent a potential income stream, the percent of mineral rights purchased (MINERAL) was expected to have a positive impact on per acre land values.

Locational factors, such as where the tract is situated with respect to population centers or markets, areas of economic development, and transportation routes, are hypothesized to affect land values. GIS analysis of tract location indicated that the largest town in the parish was generally the closest area of economic development for each tract. GIS procedures were then used to estimate the straight line distance to the largest town in the parish (DISFT) for each reported sale. While not reflecting the impacts of rivers, roads, national forests, lakes, and other factors that may alter actual transportation routes, straight line distances served as a proxy for the distance from the tract to areas of economic development. Since location theory suggests that there is an inverse relationship between distance to input and output markets and land prices, the coefficient of DISFT was expected to be negative.

Several factors expected to affect land values were modeled as discrete variables. These included the presence of a paved access road (RT), principal reasons for purchase of the tract, and variables that attempted to measure the effects of governmental crop support programs on rural land values. Significant reasons for purchase included expansion of current land holdings, regardless of purpose (RPE), investment (RPI), establish farm (RPF), and residence (RPR). A discrete variable was defined for tracts containing land enrolled as commodity base acreage. These crops included cotton (CB) and rice (RB).

Spatially overlaying the location of each rural land sale on a GIS map of the general soil areas in Louisiana allowed the estimation of discrete (dummy) variables for the general soil classification associated with each tract of rural land. Louisiana has a wide variation in general soil types, affecting the range of crops that can be grown. For example, Coastal Prairie soils in southwest Louisiana have an impervious subsoil suitable for rice production, whereas, many of the alluvial soils of the Mississippi, Ouachita, and Red River areas are well suited for cotton and other row crop production. Variation in commodity production affects the income producing capacity of the tract and, hence, rural land value.

Mean values of all variables used in rural land submarket hedonic models are presented in Table 2. Results in Table 2 indicate that mean rural real estate values ranged from $640 per acre in the North Delta Area to $847 per acre in the Red River Area. Mean tract size ranged from 175 acres in the Red River Area to 386 acres in the Central Delta Area. Mean values given in Table 2 also indicate substantial variability for several rural land characteristics. For example, the standard deviation for price per acre ranged from $236 in the North Delta Area to $909 in the Red River Area. This suggests that approximately 68 percent of the reported sales in the North Delta Area are expected to fall in the price interval of $404 to $876 per acre (the mean plus and minus one standard deviation). This variation in per acre real estate value is expected to be due to locational, productivity, and other differences that exist among reported real estate sales. The mean values for the discrete variable measuring the presence of cotton base acreage were 0.12, 0.51, and 0.11 for the Red River, North Delta, and Central Delta Areas, respectively. For the North Delta, this indicates that 51 percent of the 131 reported sales contained cotton base acreage.

Empirical Results

First-stage OLS hedonic regressions for each submarket area, using the model specification given by equation (2), are presented in Table 3. Each submarket column in Table 3 corresponds to an explanatory variable on the left-hand side. Because each rural land submarket area is unique, models were individually specified. While variables such as size of tract (SIZE), value of improvements (VALUE), road frontage (ROADFT), distance to the largest town in the parish (DISFT), percent of mineral rights purchased (Mineral), and paved access road (RT) were included in all submarket models, the inclusion of other continuous and discrete explanatory variables depended on their relevance to each respective submarket. Only those variables included in each submarket model have a corresponding parameter estimate and t-ratio (Table 3).

To test hypotheses and examine levels of significance of parameters in each hedonic pricing model, certain assumptions of the properties of the random disturbance term (ϵ) must be true. These properties include: (i) ϵ are random variables with expected values of zero; (ii) ϵ have the same variance and are therefore homoskedastic; (iii) ϵ have zero covariances; and, (iv) ϵ are independent of the regressors. In addition, it is further assumed that the random disturbance terms are approximately normally distributed.

Breusch-Pagan-Godfrey, ARCH, Harvey, and Glejser tests (SHAZAM, 1993) for the assumption of constant variance (homoskedasticity) for the random disturbance term for each submarket model indicated failure to reject the null hypothesis of homoskedastic disturbance terms for each submarket model. Also, Pearson correlation coefficients were computed between all pairs of explanatory variables. The magnitude of the correlation coefficients did not suggest multicollinearity problems. The Shapiro-Wilk test statistic (W) was used to test the null hypothesis of normal random disturbance terms for each submarket model (Table 3). With the exception of the North Delta Submarket, the null hypothesis of normality was not rejected at the 0.05 level for all submarket models. Normality was not rejected for the North Delta Submarket at the 0.01 level. Coefficients of the explanatory variables are discussed by relevant submarket area.

Red River Area

Red River Area respondents indicated that investment, expansion, and residence were the most frequent reasons for tract purchase. Less often cited reasons for purchase included recreation, commercial development, and establishment of a farm. Including discrete variables into the Red River model for investment (RPI), expansion (RPE), and residence (RPR) resulted in a statistically significant coefficient for RPR. This relationship was expected because of residential competition for rural land in the rural urban fringe areas of Shreveport and Alexandria.

Geo-referencing each of the 151 reported sales in the Red River Area indicated that 65 of the tracts (43 percent) were located in the highly productive Recent-Alluvium Red River general soil area. Fifty-seven tracts (38 percent) were located in the Coastal Plain general soil area. The remaining tracts were located in the Gulfcoast Flatwoods and Minor Floodplains. Discrete variables for the tracts located in the Coastal Plain (S1) and the Red River (S8) general soil areas were included in the analysis to measure the effect of type of soil on land values. Neither of these variables was statistically significant.

More than 9,000 acres of government program crop base acreage were reported by Red River Area respondents. The largest proportion of reported base acreage was cotton base (39 percent), with the remaining base divided between smaller amounts of rice, wheat, corn, oat, and grain sorghum acreage. A discrete variable for the presence of cotton base (CB) was included in the model. As indicated in Table 3, the coefficient of this variable was both statistically significant and positive.

Other statistically significant variables in the model included size of tract (SIZE), value of improvements (VALUE), percent of mineral rights purchased (MINERAL), and presence of a paved access road (RT). The signs for all statistically significant coefficients in the Red River Area land value model were as expected.

North Delta Area

The North Delta Area was the only submarket where the coefficient for the size of tract was not statistically significant. The expected inverse relationship between size of tract and value may not exist because the North Delta Area is a major production area for cotton and other row crops and larger tracts may offer economies of size in production and thus command a premium over smaller tracts.

North Delta Area survey respondents indicated that expansion, investment, and establishment of a farm were the most frequently given reasons for tract purchase. Less often cited reasons for purchase included recreation and residence. Including discrete variables into the North Delta Area model for investment (RPI), expansion (RPE), and establishment of a farm (RPF) resulted in statistically significant and negative coefficients for all three variables. The inverse relationship between these variables and per acre land prices was expected if these were marginal tracts of agricultural land that tend to change hands frequently.

Geo-referencing each of the 131 reported sales in the North Delta Area indicated that 66 of the tracts (50 percent) were located in the highly productive Recent-Alluvium Mississippi River general soil area, a major cotton producing area. Most of the remaining tracts were located in the Recent-Alluvium Ouachita River and Southern Mississippi Valley Silty Uplands general soil areas. A discrete variable for the tracts located in the Recent-Alluvium Mississippi River (S7) general soil area resulted in a statistically significant and positive coefficient.

More than 12,000 acres of government program crop base acreage were reported by North Delta Area respondents. The largest proportion of reported base acreage was cotton base (78 percent), with the remaining base divided between smaller amounts of rice, wheat, corn, oat, and grain sorghum acreage. A discrete variable for the presence of cotton base (CB) was included in the model. Results presented in Table 3 indicate that this variable had a positive and statistically significant influence on rural land values. A discrete variable for the presence of rice base acreage (RB) on a limited number of reported sales was not statistically significant, however.

Other statistically significant variables in the model included percent of mineral rights purchased (MINERAL), and the presence of a paved access road (RT). The expected signs were consistent with prior expectations for all statistically significant coefficients in the North Delta Area rural land value model.

Central Delta Area

Central Delta Area survey respondents indicated that expansion and investment were the most frequent reasons for tract purchase. Less often cited reasons for purchase included recreation, residence, and establishment of a farm. Discrete variables included in the Central Delta Area model for investment (RPI) and expansion (RPE) resulted in coefficients that were not statistically significant.

Geo-referencing each of the 103 reported sales in the Central Delta Area indicated that 40 of the tracts (39 percent) were located in the Recent-Alluvium Mississippi River general soil area, 35 tracts (34 percent) were located in the Recent-Alluvium Red/Ouachita River general soil area, and 20 tracts (19 percent) were located in the Southern Mississippi Valley Silty Uplands general soil area. Most of the remaining tracts were located in the Minor Floodplains and Coastal Plain general soil areas. Discrete variables for the tracts located in the Recent-Alluvium Mississippi River (S7), Red/Ouachita Rivers (S8), and Southern Mississippi Valley Silty Uplands (S10) general soil areas resulted in statistically significant and positive coefficients only for S8 and S10.

More than 2,400 acres of government program crop base acreage were reported by Central Delta Area respondents. The largest proportion of reported base acreage was cotton base (58 percent), with the remaining base divided between smaller amounts of rice, wheat, corn, and grain sorghum acreage. A discrete variable for the presence of cotton base (CB) was included in the model. The coefficient for this variable was both statistically significant and positive.

Other statistically significant variables in the model included percent of size of tract (SIZE), distance to the largest town in the parish (DISFT), and the presence of a paved access road (RT). The expected signs were consistent with prior expectations for all statistically significant coefficients in the Central Delta Area rural land value model.

Implicit Marginal Prices of Characteristics

Due to the implicit nature of the first-stage hedonic model, only point estimates of the marginal prices are obtained using the quantities of the characteristics in question and the per acre prices paid. Therefore, implicit marginal prices are only evaluated for individual tracts on a post sale basis and no direct implications can be drawn from the results of these point estimates (Danielson, 1984). However, it was possible to observe the magnitude and direction of influence of the characteristics by examining implicit prices at mean values of rural land price and characteristic quantity. When the coefficient of a characteristic is positive, the resulting implicit marginal price is necessarily positive. A positive implicit marginal price indicates that an increase in that characteristic results in an increase in the price of rural land. Conversely, a negative implicit marginal price resulting from a negative coefficient has a depressing effect on rural land prices. Using the estimated coefficients from the first-stage hedonic models (Table 3) and mean levels of prices and characteristics (Table 2), the mean implicit marginal prices for rural land characteristics were estimated (Table

4). While implicit marginal prices are presented for all characteristics, only those resulting from statistically significant coefficients are discussed.

Per acre rural land values varied inversely with tract size (as hypothesized) in two of the three submarket areas. Resulting implicit marginal prices for tract size at mean levels of prices and characteristics were $-1.82 in the Red River Area and $-0.15 in the Central Delta Area. Interpretation of these results suggests that land price declines by $0.15 per acre with a one acre increase in tract size in the Central Delta Area. The implicit marginal price varies proportionately with per acre price. Tracts selling above the mean price of $733.34 in the Central Delta Area yield implicit marginal prices that suggest per acre land prices decline more than $0.15 per acre with a one acre increase in size of tract; the converse is true for tracts below the mean price of $733.34. For example, if the mean per acre price for the Central Delta were $1,000 per acre, the implicit marginal price would be $-0.21 per acre; whereas, if it were $600 per acre, the implicit marginal price would be $-0.12 per acre. The effect of size on per acre values for the Red River Area is interpreted in a similar manner.

The value of improvements (VALUE) was included in each of the three rural land submarket models. The coefficient was statistically significant and exhibited the expected positive sign for the Red River Area. The implicit price of $0.0075 for VALUE in the Red River Area suggests that $10,000 in improvements on a tract would increase per acre land values by $75 per acre, other factors held constant.

The coefficient for distance in feet to the largest town in the parish (DISFT) was statistically significant in one of the three submarket models, with the expected inverse relationship to per acre land values. An implicit price of $-0.0021 was estimated for the Central Delta Area. Interpreting the estimated implicit price of $-0.0021 suggests that per acre land prices decrease by $0.0021 with each additional foot from the largest town in the parish. In terms of miles, this would mean that each additional mile from the largest town would decrease per acre land values by $11.09 per acre.

The estimated coefficient for percent of mineral rights purchased (MINERAL) was statistically significant and positive in two submarket models. Estimated implicit prices for percent of mineral rights purchased were $0.94 per acre in the North Delta Area and $2.15 per acre in the Red River Area. Interpreting the implicit value for the Red River Area suggests that each percent increase in mineral rights purchased raises the per acre value of rural land by $2.15 per acre.

The estimated coefficient for the presence of a paved road access (RT) was statistically significant and positive in all three submarket models. As Table 4 indicates, the estimated implicit price of a paved access road ranged from $75.74 per acre in the North Delta Area to $269.62 per acre in the Red River Area. This suggests that the presence of a paved access road in the North Delta Area adds $75.74 per acre to land values, other factors remaining constant.

As previously described, the reason for tract purchase varied by submarket area. Expansion (RPE) and investment (RPI) were given as a primary reason for purchase in all rural land submarket areas. The North Delta area was the only submarket where establishment of a farm (RPF) was given as primary reason for tract purchase. The coefficients of RPE, RPI, and RPF were statistically significant in the North Delta Area only. The estimated implicit marginal prices of RPE, RPI, and RPF for the North Delta Area were $-108.40, $-179.26, and $-180.66, respectively. Interpreting the marginal implicit price of RPE for the North Delta Area would suggest that tracts bought for expansionary reasons are typically valued at $108.40 less per acre than tracts purchased for other reasons, such as residence or commercial development.

Residence (RPR) was a primary reason for purchase in the Red River Area only. The estimated implicit price of $315.68 per acre suggests that, for the Red River Area, a tract purchased for the reason of residence would be valued at $315.68 per acre more than tracts purchased for other reasons.

A discrete variable for the presence of government program cotton base acreage (CB) was positive and statistically significant in all three areas. Estimated implicit prices were $174.34, $188.43, and $379.15 per acre for the North Delta, Central Delta, and Red River Areas, respectively. For the North Delta Area, the results indicate that a tract with cotton base acreage would be valued at $174.34 more per acre than a tract without cotton base acreage.

Geo-referencing the location of each tract of rural land in the study allowed the use of discrete variables for the general soil areas found in Louisiana. Submarkets with a relatively large number of tracts located in the highly productive Recent Alluvium-Mississippi River general soil area (S7) included the North Delta and Central Delta Areas. However, the estimated coefficient for S7 was statistically significant in the North Delta model only. The estimated implicit price for S7 of $95.73 indicates that a North Delta Area tract located in the Recent Alluvium-Mississippi River general soil area is valued at $95.73 more per acre than a tract located in another general soil area.

The Red River and the Central Delta Areas contained a relatively large number of tracts in the Recent Alluvium-Red/Ouachita River general soil area (S8). The estimated coefficient for S8 was positive and significant in the Central Delta model. The estimated implicit price of $468.88 per acre suggests that a tract located in this highly productive general soil area is valued at $468.88 more per acre than a tract found in another general soil area in the Central Delta.

A discrete variable was also included for the Southern Mississippi Valley Silty Uplands general soil area (S10) in the Central Delta model. The estimated coefficient for S10 was statistically significant and positive, with an estimated implicit marginal price of $368.72 per acre.

Conclusions

Results from the first-stage hedonic models suggested that several physical and locational tract characteristics affect per acre land values in Louisiana. The impact of value of improvements made on or to the tract, percent of mineral rights purchased, presence of a paved access road, residential uses, presence of government program cotton base acreage, and general soil type all had statistically significant positive influences on per acre land values. The size of tract and distance to markets areas were found to have statistically significant inverse relationships with per acre rural land values. Evidence presented in this study suggests that Louisiana rural land values are strongly influenced by the income producing potential of the tract. However, all variables were not statistically significant for each submarket model. The results of the first-stage hedonic models are comparable to cross-sectional rural land value studies conducted in other states (Danielson, 1984; Elad, Clifton, and Epperson, 1994).

Changes in government price-support policies for cotton are expected to seriously impact the value of Louisiana land containing cotton base acreage. This study indicates that the impact of the FAIR Act on government enrolled Louisiana land values will vary by cotton production area within the state. Results presented suggest that land values in the highly productive North Delta Area (where the majority of Louisiana cotton production takes place) will be affected least by the seven-year phase out of government supports for cotton. However, in the Red River Area (a more marginal production area), the phase out of government supports will have a more depressing effect on the value of enrolled land.

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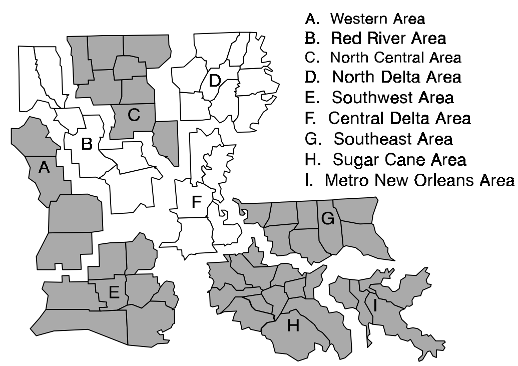

Figure 1. Louisiana Rural Land Submarket Areas.

Table 1. Hedonic Pricing Model Variables, Louisiana Rural Real Estate Market, 1994.

Symbol	Variable	Expected Sign
Continuous Variables		
PRICE	Per acre price of land ($)	
SIZE	Size of tract (acres)	(-)
CROP	Percent cropland	(+)
PAST	Percent pastureland	(+)
TIMB	Percent timberland	(-)
VALUE	Value of improvements	(+)
ROADFT	Road frontage (feet)	(+)
DISFT	Distance to markets	(-)
MINERAL	Percent mineral rights	(+)
Discrete Variables		
RT	Paved road access	(+)
RPE	Reason for purchase: expansion	(+)
RPI	Reason for purchase: investment	(+)
RPF	Reason for purchase: farm	(+)
RPR	Reason for purchase: residence	(+)
CB	Presence of cotton base	(+)
RB	Presence of rice base	(+)
Discrete Soil Variables		
S1	Coastal Plain	(+)
S7	Mississippi River Alluvium	(+)
S8	Red/Ouachita River Alluvium	(+)
S10	So. Miss. Valley Silty Uplands	(+)

Table 2. Mean Values of Variables Used in Hedonic Analysis, Louisiana Rural Real Estate Market, 1994.

	Rural Land Submarket Area		
Variable[a]	Red River	North Delta	Central Delta
PRICE ($/ac.)	846.92	640.30	733.34
	(909.01)[b]	(236.69)	(376.22)
ln PRICE	6.45	6.39	6.49
	(0.71)	(0.38)	(0.46)
SIZE (ac.)	174.61	246.49	386.17
	(266.48)	(327.28)	(871.12)
ln SIZE	4.42	5.00	4.94
	(1.19)	(0.98)	(1.31)
CROP (%)	27.21	75.72	48.00
	(41.73)	(31.93)	(45.95)
PAST (%)	16.73		
	(34.31)		
TIMB (%)	42.03		
	(47.57)		
VALUE ($)	13704.20	4743.51	6715.53
	(32804.04)	(14265.97)	(26227.63)
ROADFT (ft.)	846.33	832.29	549.90
	(1625.24)	(1164.57)	(1398.28)
DISFT (ft.)	86741.66	60131.44	62690.22
	(37608.42)	(28702.33)	(27798.81)
MINERAL (%)	52.07	40.85	30.03
	(43.84)	(43.25)	(40.32)
RT	0.54	0.45	0.42
	(0.50)	(0.50)	(0.50)
RPE	0.21	0.56	0.38
	(0.41)	(0.50)	(0.49)
RPI	0.40	0.17	0.15
	(0.49)	(0.38)	(0.35)
RPF		0.11	
		(0.31)	
RPR	0.17		
	(0.38)		
CB	0.12	0.51	0.11
	(0.33)	(0.50)	(0.31)
RB		0.04	
		(0.19)	
S1	0.38		
	(0.49)		
S7		0.50	0.39
		(0.50)	(0.49)
S8	0.43		0.34
	(0.50)		(0.48)
S10			0.19
			(0.40)
N	151	131	103

[a] Variables are defined in Table 1.
[b] Standard deviations are in parentheses.

Table 3. Estimated Coefficients of First-Stage Hedonic Models, by Rural Land Submarket Area, Louisiana, 1994.

	Rural Land Submarket Area		
Variable[a]	Red River	North Delta	Central Delta
ln SIZE	-0.3759	0.0199	-0.0793
	(-7.27)***b	(0.58)	(-2.05)**
CROP	0.0016	0.0003	-0.1E-4
	(0.71)	(0.26)	(-0.01)
PAST	0.0019		
	(1.01)		
TIMB	-0.0016		
	(-0.88)		
VALUE	0.9E-5	0.3E-5	0.1E-5
	(6.38)***	(1.11)	(0.77)
ROADFT	0.3E-4	-0.3E-4	0.3E-5
	(1.02)	(-1.05)	(0.09)
DISFT	-0.2E-6	-0.4E-6	-0.3E-5
	(-0.14)	(-0.37)	(-1.64)*
MINERAL	0.0025	0.0015	-0.0020
	(2.37)***	(1.99)**	(-1.60)
RT	0.2815	0.1140	0.2155
	(2.77)***	(1.72)*	(2.30)**
RPE	0.0861	-0.1816	-0.0647
	(0.61)	(-2.05)**	(-0.58)
RPI	0.0522	-0.3223	-0.2074
	(0.37)	(-2.91)***	(-1.45)
RPF		-0.3239	
		(-2.63)***	
RPR	0.3284		
	(2.16)**		
CB	0.3830	0.2432	0.2377
	(2.37)***	(3.49)***	(1.77)*
RB		0.2697	
		(1.53)	
S1	0.1098		
	(0.92)		
S7		0.1416	0.2327
		(2.09)**	(1.34)
S8	0.0906		0.5081
	(0.55)		(3.06)***
S10			0.4240
			(2.32)**
Intercept	7.4735	6.1815	6.7066
	(28.61)***	(32.86)***	(29.78)***
R^2	0.55	0.26	0.35
F-Value	10.95	3.18	3.63
W[c]	0.9810**	0.9643***	0.9879**
N	151	131	103
Dependent Variable: ln PRICE			

[a] Variables are defined in Table 1.
[b] t-ratios are in parentheses.
[c] Shapiro-Wilk test statistic for normality.
***Significant at the 0.01 probability level.
**Significant at the 0.05 probability level.
*Significant at the 0.10 probability level.

Table 4. Implicit Marginal Prices of Characteristics at Mean Price and Characteristic Levels, Louisiana Rural Real Estate Market, 1994.

	Rural Land Submarket Area		
Variable[a]	Red River	North Delta	Central Delta
SIZE	$ -1.82***[b]	$ 0.05	$ -0.15**
CROP	1.33	0.18	-0.01
PAST	1.61		
TIMB	-1.38		
VALUE	0.0075***	0.0017	0.0010
ROADFT	0.0254	-0.0186	0.0024
DISFT	-0.0002	-0.0003	-0.0021*
MINERAL	2.15***	0.94**	-1.44
RT	269.62***	75.74*	172.33**
RPE	67.00	-108.40**	-50.21
RPI	36.71	-179.26***	-143.41
RPF		-180.66***	
RPR	315.68**		
CB	379.15***	174.34***	188.43*
RB		185.34	
S1	91.62		
S7		95.73**	178.19
S8	67.64		468.88***
S10			368.72**

[a] Variables are defined in Table 1; unit of measurement is dollars per acre.
[b] Significance of parameter used in calculation: ***0.01 level, **0.05 level, and *0.10 level.