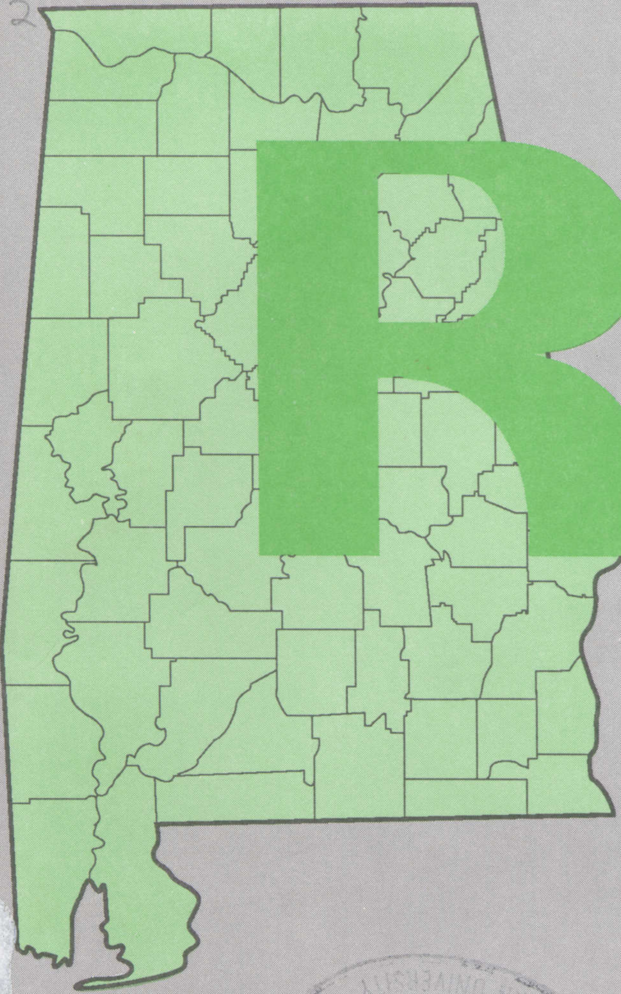

RURAL LAND MARKETS IN ALABAMA

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Lowell T. Frobish, Director Auburn University
Auburn University, Alabama

CONTENTS

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Rural Land Markets In Alabama

J. L. Adrian and W. E. Hardy*

THE VALUE of real estate is a major component of the balance sheet for the agricultural sector. Prior to 1960, the value of real estate represented about two-thirds of the value of total agricultural assets *(17)*. After that date, the relative importance of real estate to total assets increased to a high of almost 78 percent in 1980. Since that time, the proportion has shown a gradual decline to about 74 percent in 1987. About 95 percent of the decline in value of agricultural assets since 1980 can be attributed to falling real estate values.

The declines in land values in the early to mid-1980's created severe financial hardships for many farmers. The eroding financial base depleted equity levels and forced many highly leveraged individuals into foreclosure. Inability of farmers to make loan payments, when coupled with declining collateral values and increased foreclosures, placed severe financial pressures on lenders who serve the agricultural industry. Agriculturally oriented commercial banks and agencies of the Farm Credit System found some loans, which had appeared previously to be strong from the viewpoint of the borrower's balance sheet, were no longer viable and had to be placed in either vulnerable or loss categories.

One factor which contributed to the financial problems confronting farmers and lenders in recent years was the volatility of the rural land market. Basically, farmers' and lenders' expectations of strong, appreciating land markets were not fulfilled. Changes in net returns occurred in response to variations in product prices, production costs, government programs, weather conditions, and international influences on markets. These conditions influenced dif-

*Professors of Agricultural Economics.

ferent geographic areas of the United States to varying degrees. While conditions might not have been as severe in the Southeast and Alabama as in other regions, many farmers and financial institutions still experienced extreme stress.

In recognition of these circumstances, this study analyzed the rural land market in Alabama. Describing changes in farm real estate values occurring in Alabama since 1975 and analyzing certain identified factors which contributed to this variation were specific objectives. Circumstances in land markets in Alabama were compared to those in Louisiana and Mississippi. Data for Alabama were further disaggregated and analyzed on the basis of land market areas, defined based on primary soil type and agricultural activity and county boundaries. Special attention was devoted to analyzing whether significant turning points in land values could be isolated for recent years.

DATA AND METHODS

Data for this study were derived from appraisal reports and bona fide farm sales listings which were collected and compiled by representatives of the Farm Credit System. A total of 19,576 observations was available from appraisal reports, while 16,968 observations were derived from bona fide sales files for the three states. The overall data set was augmented to delete observations that were not 'typical' of an agriculturally oriented land market. All observations involving tracts of less than 20 acres were deleted, along with observations in approximately the lower one-half percentage and upper one percentage of the distribution of land values. Loans and appraisals for rural homes also were not included in the data set because the central objective of the analysis was an evaluation of variation in bare land values. After adjustment for these factors, 32,565 observations were available for the tri-state comparison while 13,438, 7,769, and 11,106 observations were available for analyses at state levels (Alabama, Louisiana, and Mississippi, respectively).

Data for Alabama were further disaggregated and analyzed for two groupings: land market areas (LMA) and counties. Land market areas represented fairly homogeneous regions based on soil type and the nature of agricultural activity. Six land market areas were defined for the State, figure 1: (1) Upper Coastal Plain, (2) Lower Coastal Plain, (3) Black Belt, (4) Tennessee and Coosa River valleys, (5) Appalachia, and (6) Piedmont. Counties included in each area were: Upper Coastal Plain - Autauga, Bibb, Chilton, Elmore,

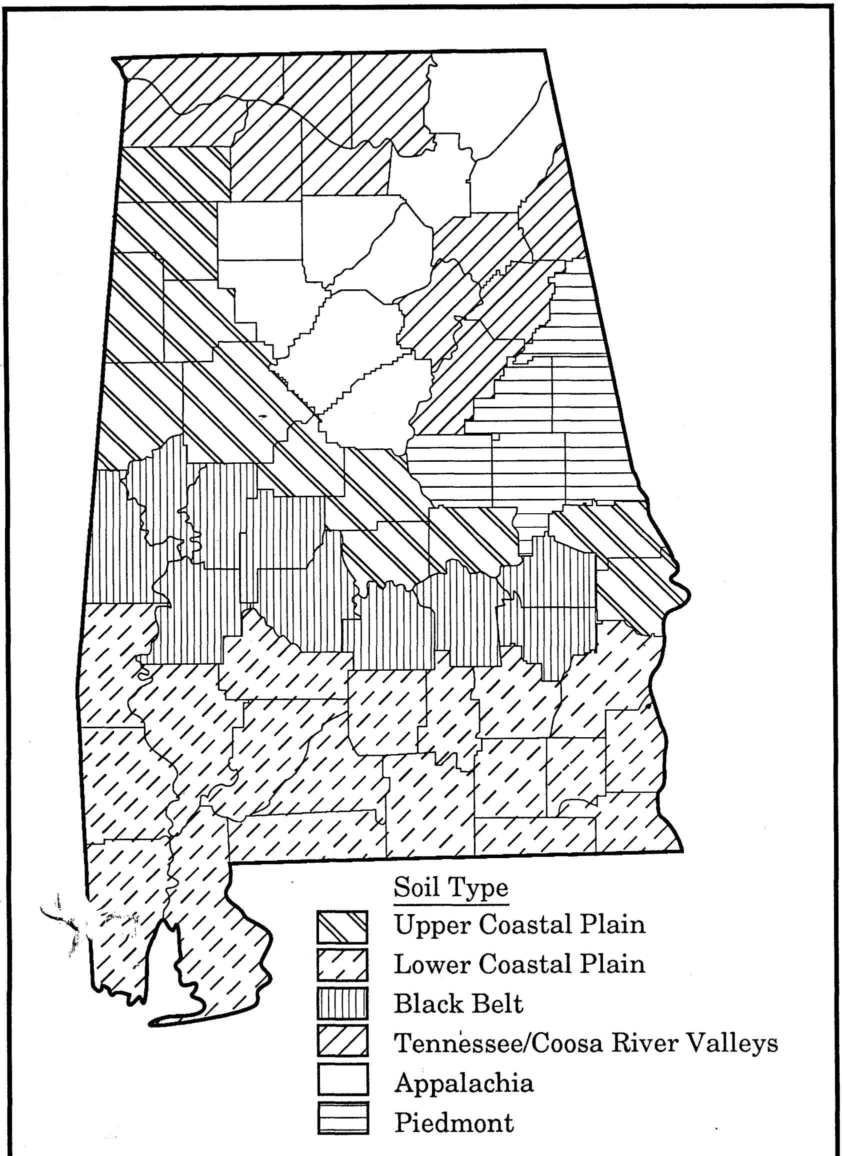

FIG. 1. Land market areas as defined by primary soil type and agricultural activity on a tract in Alabama.

Fayette, Franklin, Lamar, Lee, Marion, Pickens, Russell, and Tuscaloosa; Lower Coastal Plain - Baldwin, Barbour, Butler, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Mobile, Monroe, Pike, Washington, and Wilcox; Black Belt - Bullock, Dallas, Greene, Hale, Lowndes, Macon, Marengo, Montgomery, Perry, and Sumter; Tennessee and Coosa River valleys - Calhoun, Colbert, Cherokee, Etowah, Lawrence, Lauderdale, Limestone, Madison, Morgan, Shelby, and Talladega; Appalachia - Blount, Cullman, DeKalb, Jackson, Jefferson, Marshall, St. Clair, Walker, and Winston; and Piedmont - Chambers, Clay, Cleburne, Coosa, Randolph, and Tallapoosa.

Descriptive statistics and standard statistical techniques were used to describe and analyze land markets at the various levels of aggregation. Data analyzed covered a period from January 1, 1976, through June 9, 1987.

PREVIOUS RESEARCH

Several studies have analyzed variations in land values in Alabama. Reports were developed from research designed to isolate and analyze factors affecting the value of rural property in the Limestone Valley *(11),* Wiregrass *(16),* and Black Belt *(13)* areas of Alabama. For each study, location relative to a city, value of improvements, and tract size had significant impacts on per acre land values. Distance to a city and tract size had curvilinear impacts, with the marginal impact declining as distance and tract size increased. Value of improvements and transportation access variables (presence of paved road frontage, availability of railroad loading point, and river access) had positive effects on value. The portion of open land was important in the Black Belt region while presence of a community water system had a positive impact on value in the Limestone Valley area.

Kizer and Spurlock *(10)* noted increasing farmland values for Mississippi between 1945 and 1974. When adjusted by the gross national product index (GNPI) and the prices paid index (PPI), real values for land decreased throughout the 1971-80 period. Real values increased, however, when the prices received index (PRI) and the consumer price index (CPI) were used. They concluded that farm related economic factors, measured by the prices received index and the prices paid index, are more reflective of factors influencing farm land values than general factors measured by the GNPI and CPI.

In examining the farm real estate market for Louisiana, Vandeveer's *(20)* results were consistent with those of Plaxico and Kletke *(14)* for Oklahoma. Value increases provide an increased equity base, making further borrowing and farm expansion possible. Vandeveer *(20)* also found that equity growth made increased borrowing possible to meet cash flow needs. Blase and Hesemann *(4)* attempted to explain the variation in land prices for a sample of Missouri farms and to overcome some of the typical difficulties that exist because of data problems and extreme heterogeneity of many populations. Variables related to productivity (acres of cropland, yield ratings, size of barn, etc.) were found to be significant.

Vollink *(21)* partitioned North Carolina into four land market regions to perform an analysis of bona fide 1975-76 sales data provided by the Federal Land Bank of Columbia. Flue-cured tobacco allotments had an expected strong positive influence on value in selected areas of the State. Also, land financed by the Federal Land Bank had significantly lower prices than tracts financed by other lenders.

ANALYSIS OF RURAL LAND VALUES

Descriptive Analysis

Land values in Alabama and the tri-state region have shown much variability since 1976, table 1 and figure 2. Louisiana had the highest values, while Mississippi generally had the lowest values. Values in Alabama and Mississippi were not greatly different. Throughout the 1970's, land values increased, peaking in 1980 for Alabama and in 1981 for Louisiana and Mississippi. By 1986, values in all three states had declined to levels comparable with 1976. While average annual values increased 77 percent in Alabama, 117 percent in Louisiana, and 127 percent in Louisiana between 1976 and the 'peak' year, values declined to levels representing only 23 percent, 8 percent, and 26 percent increases in value between 1976 and 1986 for Alabama, Louisiana, and Mississippi, respectively. The highest average per acre value for Alabama ($1,248) was recorded for the third quarter of 1980. For Louisiana, the peak average per acre value ($1,824) occurred a year later in the third quarter of 1981. The maximum average values for Mississippi ($1,212) and for the tri-state region ($1,286) were also realized during the third quarter of 1981.

Evaluation of trends in values by groups based on land market areas indicated similar patterns of variation among areas, figure 3. Average values tended to be highest in counties included in the Tennessee and Coosa River valleys and Appalachia groupings, table

TABLE 1. AVERAGE LAND VALUES IN DOLLARS PER ACRE FOR ALABAMA, LOUISIANA, AND MISSISSIPPI AND THE TRI-STATE REGION BY QUARTER AND ANNUAL AVERAGES, 1976-1987[1]

Year	Quarter	Region Quarterly average	Region Annual average	Alabama Quarterly average	Alabama Annual average	Louisiana Quarterly average	Louisiana Annual average	Mississippi Quarterly average	Mississippi Annual average
1976	1	562		567		683		492	
	2	573		573		813		472	
	3	659		656		996		460	
	4	644	608	675	618	787	812	529	489
1977	1	614		621		796		529	
	2	668		631		932		567	
	3	733		740		948		607	
	4	704	677	705	673	923	899	565	563
1978	1	822		846		992		654	
	2	844		815		1,064		701	
	3	908		822		1,208		793	
	4	975	885	937	855	1,317	1,127	795	732
1979	1	991		909		1,315		841	
	2	1,046		979		1,360		884	
	3	1,014		900		1,442		882	
	4	1,085	1,034	909	925	1,561	1,414	938	886
1980	1	1,134		1,001		1,471		1,008	
	2	1,177		1,007		1,609		997	
	3	1,238		1,248		1,616		955	
	4	1,227	1,188	1,163	1,092	1,604	1,566	1,038	1,003
1981	1	1,200		998		1,701		1,070	
	2	1,212		1,006		1,739		1,096	
	3	1,286		1,039		1,824		1,212	
	4	1,198	1,224	962	1,003	1,757	1,760	1,088	1,110
1982	1	1,223		1,027		1,762		1,076	
	2	1,178		961		1,762		995	
	3	1,146		980		1,685		926	
	4	1,162	1,187	853	972	1,721	1,741	1,138	1,040
1983	1	1,097		874		1,813		896	
	2	1,108		942		1,675		892	
	3	1,127		919		1,686		1,040	
	4	1,175	1,125	1,011	937	1,756	1,733	1,014	956
1984	1	1,032		805		1,521		919	
	2	994		885		1,514		769	
	3	1,077		831		1,818		855	
	4	1,015	1,027	862	847	1,559	1,589	866	854
1985	1	975		869		1,482		812	
	2	982		812		1,361		717	
	3	826		753		1,315		642	
	4	758	881	752	808	1,047	1,340	560	708
1986	1	881		809		950		650	
	2	708		711		875		605	
	3	756		798		899		573	
	4	694	738	702	760	765	879	623	618
1987[2]	1	769		799		908		596	
	2	599	739	544	757	890	905	483	572

[1]Values are the average of the bona fide sales data and appraisal data for each time period.
[2]Data were collected through June 9, 1987.

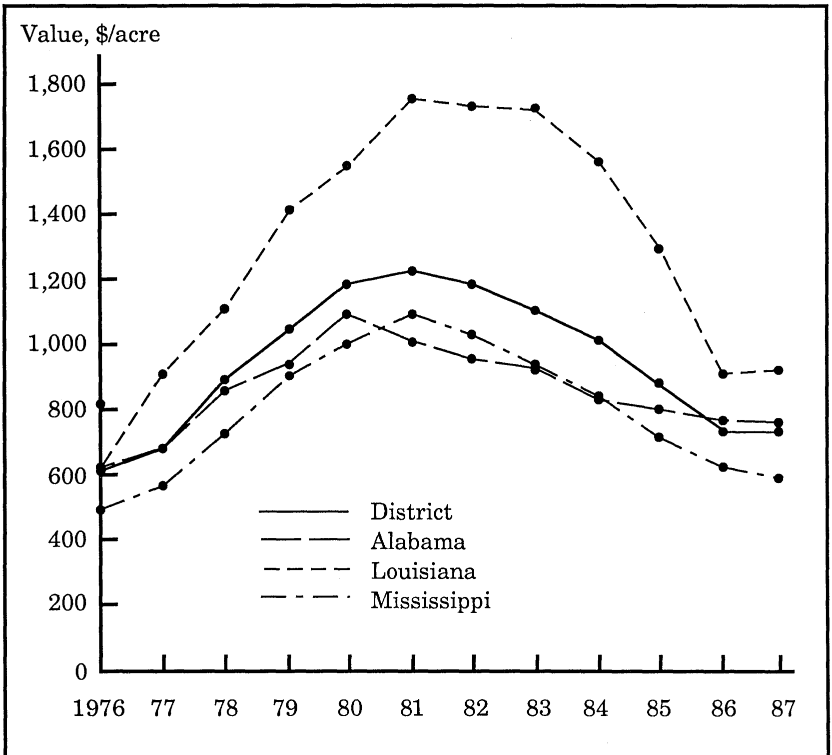

FIG. 2. Average bare land values per acre for the Fifth Farm Credit District, Alabama, Louisiana, Mississippi, 1976-1987.

2. The lowest average values were experienced in counties comprising the Piedmont region. Average values peaked in all land market areas except Appalachia in 1981. In counties designated as belonging to the Appalachia grouping, average values peaked in 1980, with a 64 percent increase experienced between 1976 and 1980. Increases in value noted for other areas between 1976 and the 1981 'peak' year were: 80 percent for the Upper Coastal Plain, 41 percent for the Lower Coastal Plain, 73 percent for the Black Belt, 51 percent for the Tennessee and Coosa River valleys, and 54 percent for the Piedmont county groupings.

Between the peak year and 1986, values declined in the Lower Coastal Plain and Black Belt areas almost back to levels for 1976. The largest increases that were maintained between 1976 and 1986 were for counties in the Upper Coastal Plain (47 percent) and Piedmont (43 percent) areas.

On a county basis, the highest average values noted were in

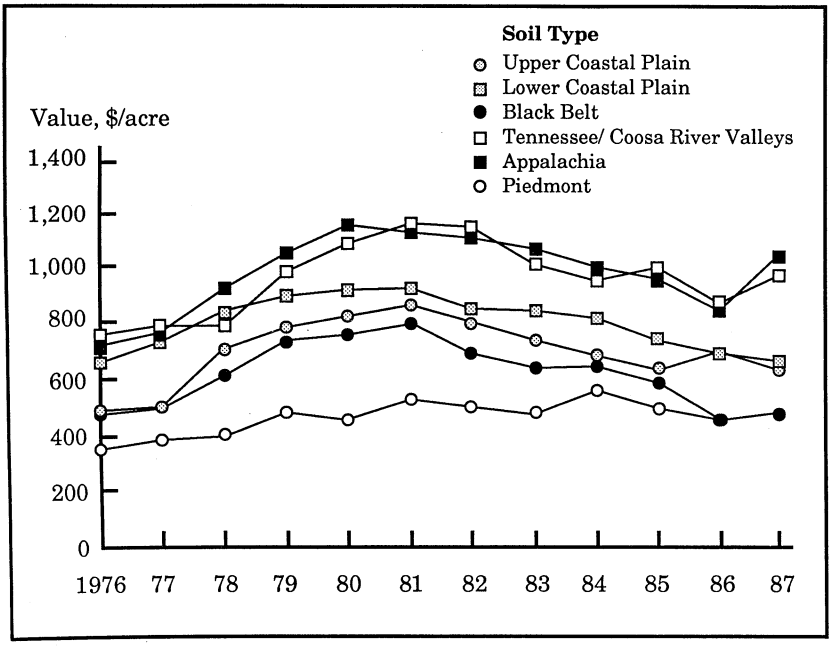

FIG. 3 Average value of land by soil type and year.

Baldwin, Jefferson, Madison, Mobile, and Shelby counties, areas with strong nonagricultural influences, table 3. On the opposite end of the spectrum, Bullock, Cleburne, Coosa, Crenshaw, Randolph, and Tallapoosa counties, which had few nonagricultural influences, tended to have the lowest average land values.

Variability in average values was similar among counties with the majority experiencing peak values in 1980 (15 counties) and 1981 (22 counties). Eleven counties had peak values in 1982. The greatest appreciation of values between 1976 and the 'peak' year occurred in Bibb (205 percent), Colbert (209 percent), Marion (239 percent), and Montgomery (153 percent) counties. By 1986, five counties (Cherokee, Henry, Houston, Jackson, and Marengo) had values which were basically the same as in 1976. Average values in 12 counties (Baldwin, Barbour, Covington, Crenshaw, Dale, Dallas, Greene, Hale, Lowndes, Morgan, Perry, and Sumter) were actually more than 5 percent less in 1986 than in 1976. Blount, Limestone, Monroe, Montgomery, St. Clair, and Shelby counties showed the most vitality in land markets, with increases in value experienced over the 1976-86 period not being totally dissipated.

TABLE 2. AVERAGE VALUE OF LAND IN DOLLARS AND SAMPLE SIZE BY LAND MARKET AREA AND YEAR, ALABAMA, 1976-87

Land market area	Average value per acre and sample size ( ) by year											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
	482	502	712	779	822	869	795	759	694	640	710	660
Upper Coastal Plain......	(68)	(80)	(219)	(340)	(242)	(392)	(186)	(165)	(189)	(174)	(89)	(11)
	665	750	856	926	920	937	840	844	818	731	705	684
Lower Coastal Plain	(147)	(186)	(468)	(672)	(672)	(739)	(378)	(348)	(355)	(275)	(208)	(39)
	462	496	613	731	765	799	702	649	652	599	478	497
Black Belt	(66)	(84)	(176)	(237)	(205)	(296)	(158)	(157)	(179)	(134)	(104)	(22)
Tennessee and Coosa	773	788	798	993	1,099	1,168	1,146	1,019	957	1,028	905	963
River valleys	(83)	(108)	(310)	(405)	(336)	(435)	(272)	(269)	(230)	(187)	(115)	(9)
	709	730	935	1,044	1,162	1,141	1,107	1,061	1,010	976	876	1,030
Appalachia..............	(70)	(120)	(282)	(339)	(270)	(325)	(213)	(184)	(225)	(195)	(79)	(8)
	336	374	401	476	439	518	502	475	563	514	479	---
Piedmont	(24)	(29)	(59)	(70)	(75)	(97)	(75)	(56)	(52)	(48)	(15)	---

TABLE 3. AVERAGE LAND VALUES IN DOLLARS PER ACRE AND SAMPLE SIZE BY COUNTY AND YEAR, ALABAMA, 1976-87

County	Average value per acre and sample size ( ) by year											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Autauga	382(5)	460(6)	590(23)	653(36)	852(20)	877(24)	703(21)	838(11)	739(17)	487(8)	917(1)	600(1)
Baldwin	1,315(30)	1,345(31)	1,609(47)	1,918(77)	1,810(54)	1,728(73)	1,688(27)	1,610(23)	1,798(20)	1,723(17)	1,165(35)	834(9)
Barbour	313(6)	623(3)	473(12)	453(29)	540(21)	563(41)	578(27)	550(10)	473(5)	375(14)	290(4)	---
Bibb	337(5)	907(2)	771(22)	951(32)	871(29)	1,027(26)	894(5)	718(5)	612(10)	528(15)	417(12)	742(3)
Blount	524(17)	693(17)	973(40)	903(50)	909(37)	965(37)	1,137(27)	1,144(19)	864(34)	699(42)	894(16)	---
Bullock	---	294(3)	328(4)	432(11)	688(11)	518(18)	437(11)	441(7)	514(7)	425(6)	568(2)	758(2)
Butler	350(7)	394(6)	581(23)	821(39)	820(22)	727(33)	711(20)	505(18)	625(27)	466(11)	501(12)	---
Calhoun	618(6)	688(5)	799(16)	1,019(17)	919(24)	1,127(25)	895(11)	759(8)	718(13)	718(5)	1,013(2)	625(1)
Chambers	362(10)	432(17)	444(10)	574(18)	546(18)	482(23)	468(17)	507(15)	569(15)	577(18)	411(5)	---
Cherokee	538(4)	756(5)	902(21)	765(16)	1,229(19)	775(19)	844(22)	671(14)	613(10)	494(8)	559(8)	---
Chilton	586(23)	531(29)	797(53)	1,084(55)	1,034(29)	946(60)	803(14)	708(26)	788(37)	760(38)	844(31)	474(3)
Choctaw	393(5)	487(23)	492(8)	489(5)	551(11)	620(2)	428(10)	440(4)	539(2)	500(1)	268(1)	
Clarke	---	541(1)	473(4)	543(11)	741(4)	716(19)	687(4)	712(2)	820(7)	370(5)	875(1)	---
Clay	327(4)	215(4)	377(12)	359(10)	511(14)	678(9)	658(11)	389(5)	445(9)	405(3)	333(1)	---
Cleburne	---	287(2)	596(3)	339(5)	387(6)	472(5)	476(7)	568(5)	522(6)	488(1)	---	---
Coffee	383(13)	495(17)	623(45)	670(57)	783(68)	719(65)	694(18)	678(28)	693(30)	567(19)	560(17)	---
Colbert	473(3)	382(2)	1,058(24)	909(22)	1,212(25)	1,172(29)	1,460(23)	1,054(18)	1,179(8)	1,134(11)	723(2)	---
Conecuh	324(4)	532(6)	610(15)	570(17)	805(25)	622(25)	651(17)	617(22)	617(22)	743(5)	395(3)	535(1)
Coosa	368(3)	344(3)	443(17)	362(15)	296(7)	649(16)	316(10)	409(8)	319(2)	320(5)	477(3)	---
Covington	418(9)	498(15)	704(25)	686(65)	707(60)	798(56)	750(47)	651(36)	685(35)	477(19)	385(13)	551(11)
Crenshaw	346(3)	297(3)	440(18)	569(64)	587(35)	699(18)	519(25)	513(8)	540(16)	407(18)	323(10)	---
Cullman	757(7)	709(19)	1,039(62)	1,072(67)	1,210(54)	1,099(69)	1,173(39)	1,190(26)	987(36)	1,088(18)	908(12)	1,483(3)
Dale	609(4)	713(10)	632(22)	652(36)	866(20)	900(33)	778(20)	790(14)	778(20)	672(18)	538(8)	---
Dallas	450(8)	457(17)	595(35)	855(39)	912(28)	821(49)	776(18)	650(22)	654(33)	532(17)	422(9)	531(4)
DeKalb	617(11)	736(25)	855(52)	1,077(65)	1,081(57)	1,101(69)	999(37)	948(48)	926(32)	840(39)	707(21)	600(1)
Elmore	464(8)	541(11)	861(18)	795(38)	761(41)	884(47)	873(22)	983(17)	678(21)	555(22)	804(10)	---
Escambia	809(9)	1,066(10)	1,019(2)	1,082(22)	1,206(21)	1,143(20)	906(9)	945(20)	1,098(7)	1,199(12)	829(16)	---
Etowah	805(6)	1,197(6)	1,016(23)	727(29)	1,166(18)	1,480(24)	1,036(19)	1,103(13)	927(12)	682(10)	864(9)	930(1)
Fayette	---	474(3)	617(3)	381(10)	706(8)	784(27)	1,444(12)	878(11)	479(11)	387(5)	---	---
Franklin	428(3)	431(4)	736(24)	662(32)	802(17)	813(60)	756(25)	593(21)	688(20)	570(15)	383(6)	---

Continued

TABLE 3. (CONTINUED) AVERAGE LAND VALUES IN DOLLARS PER ACRE AND SAMPLE SIZE BY COUNTY AND YEAR, ALABAMA, 1976-87

County	Average value per acre and sample size ( ) by year											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Geneva	511(20)	577(23)	681(58)	824(78)	845(100)	872(98)	939(32)	874(38)	747(36)	651(33)	546(14)	452(2)
Greene	370(5)	414(7)	476(10)	513(10)	581(11)	760(14)	580(6)	462(7)	537(6)	452(30)	341(6)	---
Hale	586(10)	529(7)	645(19)	753(22)	898(23)	789(21)	666(16)	636(17)	609(16)	690(7)	400(7)	432(4)
Henry	614(7)	733(9)	696(16)	824(33)	762(43)	801(49)	781(19)	730(13)	880(13)	559(13)	620(14)	836(2)
Houston	728(16)	752(12)	916(55)	1,238(56)	1,163(47)	1,221(55)	925(26)	1,095(25)	1,079(27)	841(24)	734(10)	886(9)
Jackson	708(3)	595(12)	655(24)	662(24)	1,004(25)	942(20)	687(21)	794(18)	719(19)	992(19)	704(6)	775(2)
Jefferson	1276(4)	1,650(2)	1,512(7)	1,547(9)	2,319(6)	1,249(13)	2,200(12)	1,000(1)	1,265(8)	1,376(8)	675(1)	---
Lamar	---	387(3)	477(6)	521(11)	746(7)	819(19)	644(8)	1,027(10)	680(4)	636(4)	482(1)	---
Lauderdale	618(9)	831(9)	1,216(39)	1,052(53)	1,233(44)	1,158(60)	1,340(35)	941(45)	841(34)	902(19)	861(15)	1,500(1)
Lawrence	614(3)	649(16)	1,005(41)	912(44)	1,030(35)	1,203(54)	1,212(39)	997(35)	888(35)	830(41)	651(20)	791(2)
Lee	424(8)	540(5)	682(11)	824(40)	818(21)	746(33)	806(19)	805(13)	890(22)	809(17)	695(5)	850(1)
Limestone	696(13)	827(24)	884(48)	950(67)	1,084(57)	1,238(53)	1,182(29)	1,145(36)	948(31)	989(22)	1,053(12)	---
Lowndes	535(6)	512(6)	534(10)	598(16)	616(21)	721(33)	631(24)	506(15)	635(26)	626(15)	395(14)	486(12)
Macon	393(6)	421(4)	391(15)	493(20)	473(20)	587(21)	463(16)	503(15)	494(16)	506(16)	339(2)	430(2)
Madison	1,143(17)	908(13)	1,011(33)	1,338(66)	1,165(45)	1,363(78)	1,445(44)	1,304(43)	1,445(32)	1,806(29)	1,391(20)	2,200(1)
Marengo	452(7)	502(13)	717(17)	1,022(21)	712(20)	846(34)	749(18)	646(20)	530(13)	510(9)	451(11)	---
Marion	354(4)	600(1)	703(11)	791(23)	827(19)	1,087(25)	1,199(17)	984(10)	576(13)	624(18)	468(7)	---
Marshall	802(17)	784(28)	909(52)	1,163(74)	1,268(45)	1,191(70)	1,267(35)	1,166(27)	1,163(48)	1,148(48)	915(10)	822(2)
Mobile	---	1,219(5)	1,612(33)	1,489(28)	1,333(18)	1,876(24)	1,721(10)	1,848(17)	1,383(24)	1,533(16)	1,432(10)	850(1)
Monroe	512(6)	862(14)	922(26)	782(27)	907(49)	924(31)	901(26)	865(20)	671(21)	6781(18)	787(13)	---
Montgomery	435(7)	589(17)	880(32)	939(41)	1,046(25)	1,100(45)	1,050(29)	952(24)	959(31)	924(21)	797(23)	647(3)
Morgan	836(16)	685(18)	906(37)	879(40)	1,065(30)	1,000(40)	1,103(22)	1,464(23)	783(21)	1,259(11)	777(9)	700(1)
Perry	473(14)	553(9)	550(18)	627(29)	791(31)	788(45)	966(12)	664(17)	616(21)	459(17)	371(19)	366(4)
Pickens	365(5)	501(15)	540(12)	673(19)	666(26)	583(15)	504(10)	535(9)	472(6)	443(3)	712(1)	
Pike	386(5)	377(5)	525(21)	656(30)	576(34)	719(38)	617(20)	548(21)	461(16)	425(10)	505(18)	---
Randolph	351(3)	---	345(2)	393(7)	532(9)	473(14)	494(10)	501(9)	494(7)	386(10)	480(2)	---
Russell	414(2)	488(3)	397(4)	499(20)	689(16)	878(20)	575(17)	631(19)	482(7)	593(4)	1,268(2)	500(1)
St. Clair	600(1)	1,566(3)	849(14)	1,169(19)	820(15)	1,073(12)	1,106(11)	975(15)	1,161(8)	870(10)	1,025(6)	---
Shelby	828(6)	790(11)	1,236(20)	1,152(20)	1,515(25)	1,842(20)	1,477(22)	1,309(20)	1,489(14)	1,315(14)	1,325(8)	---
Sumter	469(1)	---	518(13)	577(27)	619(15)	676(14)	438(9)	631(13)	464(10)	386(11)	327(9)	325(1)

Continued

TABLE 3. (CONTINUED) AVERAGE LAND VALUES IN DOLLARS PER ACRE AND SAMPLE SIZE BY COUNTY AND YEAR, ALABAMA, 1976-87

County	Average value per acre and sample size ( ) by year											
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Talladega	514(4)	488(7)	566(11)	822(32)	990(24)	854(38)	1,125(23)	708(20)	885(26)	866(20)	738(12)	949(1)
Tallapoosa	278(3)	442(2)	319(14)	433(14)	346(18)	458(30)	552(20)	458(14)	733(13)	648(11)	737(3)	---
Tuscaloosa	673(4)	582(5)	780(26)	767(29)	886(16)	875(31)	550(11)	634(12)	678(18)	741(20)	1,265(7)	950(1)
Walker	531(4)	891(1)	767(5)	1,130(12)	1,217(6)	1,248(11)	1,014(9)	1,124(16)	1,139(18)	126(6)	710(1)	---
Washington	386(2)	561(2)	511(8)	632(8)	549(9)	615(21)	809(14)	683(11)	459(7)	418(12)	414(7)	---
Wilcox	351(1)	417(7)	548(16)	544(24)	799(32)	654(27)	620(15)	571(8)	562(21)	395(6)	262(2)	505(1)
Winston	700(1)	479(4)	742(18)	712(15)	602(14)	712(15)	672(14)	675(9)	667(14)	829(11)	1,198(3)	---

MODEL SPECIFICATION

The value of a tract of farm land may be defined as the amount of money a willing buyer pays to a willing seller when ownership of the tract is transferred. Since tracts of farmland are different (due to location, size, productivity, structures, etc.), it is expected that values for various tracts will differ. Structures and improvements (houses and buildings) and standing timber are often major components of value. Thus, it is necessary to subtract the value of these items from the total value to obtain the bare land value (BLV) of a tract of farm land. Dividing the bare land value by the number of acres in the tract will provide the bare land value per acre (BLVPA), permitting the comparison of the value of one tract to another.

The analysis relates variability in a number of characteristics of a particular tract of land to value of that tract. This approach allows the structure or nature of the particular land market to be analyzed, with factors having significant influences on value being identified. The implicit model used to analyze variation in bare land values for the tri-state region, states, land market areas, and counties was specified as follows:

$$\begin{aligned} BLVPA = {} & b_0 + b_1\,AC + b_2\,ACSQ + b_3\,PCTCUL + b_4\,PCTPAS + b_5\,SLNFM + b_6\,MDNFM + b_7\,HGNFM + b_8\,IRR + b_9\,SECB + b_{10}\,SECC + b_{11}\,SECD \\ & + b_{12}\,ALLUV + b_{13}\,MISSBRN + b_{14}\,UPCOAST + b_{15}\,LOWCOAST + b_{16}\,BLKBLT + b_{17}\,TENCOS + b_{18}\,APPAL + b_{19}\,PIED + b_{20}\,REDRIV \\ & + b_{21}\,COASTMAR + b_{22}\,RICE + b_{23}\,CORN + b_{24}\,COT + b_{24}\,PNUT + b_{25}\,SB + b_{26}\,HAY + b_{27}\,CAT + b_{28}\,TIM + b_{29}\,OTH \\ & + b_{30}\,TM + b_{31}\,TMSQ + b_{32}\,TMCUB + b_{33}\,DIS + b_{34}\,DISSQ + b_{35}\,AL + b_{36}\,LA + e; \end{aligned}$$

where:

BLVPA = the bare land value ($) per acre for a particular tract;

b_0 = an intercept term;

AC = size of the tract in acres;

ACSQ = the square of the size of the tract;

PCTCUL = percent of the tract in cultivation;

PCTPAS = percent of the tract in pasture;

RINF = degree of nonfarm influence as represented by:[1]
NONFM = 1 if no nonfarm influence and 0 otherwise (base class),
SLNFM = 1 if slight nonfarm influence and 0 otherwise,
MDNFM = 1 if moderate nonfarm influence and 0 otherwise,
HGNFM = 1 if high nonfarm influence and 0 otherwise;
IRR = 1 if irrigation present and 0 otherwise;
SEC = farm security class as represented by:[2]
SECA = 1 if security class A (Excellent) and 0 otherwise (base class),
SECB = 1 if security class B (Good) and 0 otherwise,
SECC = 1 if security class C (Fair) and 0 otherwise,
SECD = 1 if security class D (Poor) and 0 otherwise;
SOIL = primary soil type in the county in which the tract was located (number of soils included and base class depended on the area and model):
ALLUV = 1 if Older Alluvial, Clay Alluvial, or Delta and 0 otherwise,
MISSBRN = 1 if Mississippi Terrace, Brown Loam and 0 otherwise,
UPCOAST = 1 if Upper Coastal Plain and 0 otherwise,
LOWCOAST = 1 if Lower Coastal Plain and 0 otherwise, BLKBLT = 1 if Black Belt and 0 otherwise, TENCOS = 1 if Tennessee or Coosa River Valleys and 0 otherwise,
APPAL = 1 if Appalachian and 0 otherwise,
PIED = 1 if Piedmont and 0 otherwise,
REDRIV = 1 if Red River Valley and 0 otherwise,
COASTMAR = 1 if Coastal Marsh and 0 otherwise,
ENT = primary farm enterprise produced on the tract as

[1]When data for a particular nonfarm influence classification were insufficient for statistical analysis, NONFM and SLNFM were grouped into "strong rural influence" (RINF) and grouping of moderate and high nonfarm influence (MDNFM and HGNFM) was used as the base for statistical tests.

[2]When data for particular farm security classifications were insufficient for statistical analysis, SECA and SECB were grouped into "high quality" security available (SECGD) and SECC and SECD were grouped into "low quality" security available. Low quality security was used as the base for statistical comparisons.

represented by (number of enterprises included in a particular model depended on the area and the nature of agricultural production):[3]

RICE = 1 if rice and 0 otherwise,
CORN = 1 if corn and 0 otherwise,
COT = 1 if cotton and 0 otherwise,
PNUT = 1 if peanuts and 0 otherwise,
SB = 1 if soybeans and 0 otherwise,
HAY = 1 if hay and 0 otherwise,
CAT = 1 if cattle and 0 otherwise,
TIM = 1 if timber and 0 otherwise,
OTH = 1 if other (wheat, sorghum, sugarcane, general farm, or other of the previously identified enterprises which may not have been important in a particular location);

TM = time the tract was valued through sale or appraisal as represented by month;
TMSQ = Time squared;
TMCB = Time cubed;
DS = straight-line distance from the center of the county in which the tract is located to the center of the nearest Standard Metropolitan area;
DSSQ = distance squared;
STATE[4] = location of the tract by state as represented by:

AL = 1 if the tract of land was located in Alabama and 0 otherwise and
LA = 1 if tract of land was located in Louisiana and 0 otherwise and
e = an error term which is assumed to be independent, normally distributed, with a mean of zero, and a homogeneous variance.

The rural land market is complex with a potentially diverse set of factors being important in explaining variations in value from one location or time period to another. Specification of this model and expected signs of parameters depended on theory related to valuation of rural land, data availability, previous research, and

[3]When data for primary enterprise were insufficient for statistical analyses, enterprises were grouped into three classes: crops (CROP), cattle (CAT), and other (OTH). The crops class was used as the base for statistical comparisons.

[4]Mississippi was used as the base for comparison in statistical tests. This variable was only included in the Tri-State model.

knowledge of rural land markets in the study area. Parameters were estimated using the Ordinary Least Squares (OLS) procedure and standard statistical assumptions. The dependent variable (BLVPA) represented nominal price or appraised land value adjusted for the value of buildings, improvements, and timber available on a tract. These factors were reflected in farm security class, land use, and availability of irrigation and were, thus, not explicitly evaluated as independent variables.

Tract size (AC) was postulated to reflect a curvilinear relationship with value, declining initially as tract size increased and eventually showing little change with tract size. Smaller tracts tend to attract more potential buyers and thus values are bid-up through heightened competition. Also, budget constraints would tend to be less for purchasers of smaller tracts. Thus, buyers could perhaps offer more per acre on smaller tracts. Given these relationships, the coefficient for AC was expected to have a negative sign, while the coefficient for ACSQ was expected to be positive.

Percent of a tract in cultivation (PCTCUL) was expected to exhibit a positive relationship with value. Generally, production of crops on cultivatable land results in higher net returns and higher land values. Percent of a tract in pasture (PCTPAS) would also reflect an intensive agricultural use of the land relative to other uses (such as timber) and thus would have a positive contribution to income and value. From these relationships, expected signs for the coefficients for PCTCUL and PCTPAS were positive. Further, the parameter for PCTCUL would be expected to be larger than that noted for PCTPAS because of the relative income producing potential for the alternative crop land uses.

Presence or degree of nonfarm influences (slight-SLNFM, moderate- MDNFM, and high-HGNFM) for a particular tract reflects factors that would tend to result in higher values due to potentially more buyers or more intensive potential uses. Since the no nonfarm influence (NONFM) classification was used as the base in the model for comparison, expected signs for coefficients for SLNFM, MDNFM, and HGNFM were positive. Further, in terms of magnitudes, the coefficients should be larger for HGNFM than for MDNFM and for MDNFM relative to SLNFM. That is, the incremental impact should be larger for tracts experiencing greater nonfarm influences.

Since the number of observations became more limited as the data set was disaggregated to land market areas and the county levels, classes of the nonfarm influence variable had to be combined to facilitate analysis. The moderate and high classes were combined to represent urban influence, while the slight and no nonfarm influence classes were combined to reflect the rural influence (RINF). Since the urban component of the variable was used as the base for statistical comparison, the parameter estimate was expected to be negative. That is, tracts experiencing important nonfarm influences should have higher values.

Availability and use of irrigation (IRR) can improve crop yields and enhance net returns for a particular tract of land. Also, irrigation tends to lessen production variability and reduce risks associated with the vagaries of weather. Thus, a positive relationship was expected for the coefficient of IRR. Since relatively few of the sample farms had irrigation systems, this variable was deleted from models estimated at the more disaggregated levels.

The 'farm security class' variable was included in the model to represent the quality of the tract in terms of such factors as condition of buildings and nature of the site along with consideration of its potential. Since the highest quality security grouping (SECA) was used as the base for statistical comparison in the tri-state and state models, coefficients for SECB, SECC, and SECD were expected to be negative. The marginal effect is expected to be greater for SECB than for SECC than for SECD. For the more disaggregated models, good security (SECA and SECB) was used as the base. Thus, the expected coefficient for poorer quality security (SECPR) is negative.

Soil type has an important impact on the productivity of a tract of land and thus income potential and value. Soil maps were evaluated and counties were grouped based on the primary soil type present. Eleven soil classifications were delineated for the tri-state region and six were identified for Alabama. Expectations were that tracts including primarily the more productive soil types would have more viable alternative agricultural uses and thus greater potential income generating capacity. This would thus result in higher values for tracts possessing such soils.

Since the primary soil type varied by county and thus the base class for statistical comparison varied, explicit specification of signs for each model was impractical. However, a general statement can be made that tracts in counties with Piedmont (PIED), Black Belt (BLKBLT), and Appalachian (APPAL) soil types would be expected to have lower values than tracts in counties with primary soil types being the Tennessee and Coosa River valleys (TENCOS) or the Alluvial, Delta types (ALLUV). That is, soils with lower recognized productivity would generate lower values for tracts than for tracts with more productive soil types, other factors being equal. As with several of the previous variables, soil type was deleted from the more disaggregated models because of the lack of sufficient data or the lack of variation in such data.

The impact on value of the primary farm enterprise produced on a tract was also evaluated. As with the soil variable, certain models did not include all commodities because these enterprises were not produced in sufficient volumes for a particular area to provide statistically viable estimates. Thus, important enterprises for a tract were explicitly included in the model and less important enterprises were grouped into an 'other' classification and statistical estimates and tests were made. Since soybeans (SB) were produced throughout the region, they were used as the base for statistical comparisons. Since soybean production is not as intensive use of land as cotton (COT), peanuts (PNUT), or rice (RICE), coefficients for these enterprises were expected to be positive. Coefficients for timber (TIM), cattle (CAT), and hay (HAY) were expected to be negative because these enterprises generally represent less intensive uses of land relative to soybean production. The sign of the coefficient for corn (CORN) was indeterminant because corn production represents a similar intensity of land use as soybeans.

For the soil area and county models, the primary farm enterprise variable was aggregated into cattle (CAT), crops (CROP), and timber (OTH) classes. Since crops represent the most intensive agricultural use of the land and this grouping was used as the base for statistical comparisons, estimated signs for other (OTH) and cattle (CAT) were expected to be negative. Also, when the counties did not have a sufficient number of observations for either class, primary farm enterprise was deleted from the analysis.

Distance a tract of land is from a metropolitan area can have an important impact on value. Being near a population center improves the options available for use of a tract and opens the tract to more intensive uses, such as commercial or residential development, if it is sufficiently near these centers. Also, close proximity to such areas generally provides more and better access to agricultural markets. Thus, agricultural incomes can be enhanced and values increased. Expectations are that value will decline with increases in distance at a non-constant rate. Thus, a curvilinear (quadratic) specification was used to capture this variability. The expected sign for distance (DS) was negative, while the expected sign for the curvilinear component (DSSQ) was positive. That is, value declines less rapidly as distance from a metropolitan area increases, a non-constant marginal effect. Since the distance variable was constant within a county, the variable was deleted from county models.

Over the period of analysis (1976-87), land values in the tri-state region have increased, have turned down, and may now be rising or at least be stabilizing. A time variable was evaluated in the model to represent this variation, plus speculative trends and potential inflation adjustments that may have occurred in the market over the time period analyzed. As with distance, values were not expected to have changed in a constant manner over the time period. Thus, curvilinear specifications (both squared and cubic terms) were used for this variable. This allows evaluation of two 'turning points' over the period of analysis. Recent speculation has involved concern as to whether land markets in the region have 'bottomed-out' and are now on the rise. This specification allows evaluation of this hypothesis. Given this perceived relationship, coefficients for time (TM) were expected to be positive, while coefficients for time squared (TMSQ) and time cubed (TMCB) were expected to be negative and positive, respectively.

A variable which reflected location of the tract by state was included in the tri-state model to represent differences in bare land value by state. Values in Louisiana were expected to be higher than those in Alabama or Mississippi, and Mississippi values were expected to be higher than those for Alabama because of the influence of the Mississippi River Delta area. Thus, since Mississippi was used as the base for statistical comparisons, the coefficient for Louisiana (LA) was expected to be positive and the expected sign for the Alabama (AL) coefficient was negative.

Model Results
Tri-State Region and States

The explanatory power (R^2) of the tri-state and state models estimated ranged from 41.1 percent for the Alabama model to 54.9 percent for the Mississippi model, table 4. All models showed good structural validity, with most variables being significant and having the correct expected signs. Eighteen of 31 variables in the tri-state model were significant with correct expected signs, while 16 of 18, 15 of 19, and 13 of 16 variables were significant with correct expected signs in the Alabama, Louisiana, and Mississippi models, respectively.

TABLE 4. BARE LAND VALUE MODELS; FIFTH TRI-STATE REGION AND ALABAMA; LOUISIANA, AND MISSISSIPPI, BASED ON APPRAISAL AND SALES DATA FOR 1976-87

Variable	Model			
	Tri-state	Alabama	Louisiana	Mississippi
Intercept	839.81* (31.53)[1]	518.30* (27.98)	1,002.64* (64.66)	928.79* (26.66)
Acres (AC)	-0.0939* (0.0049)	-0.185* (0.013)	-0.128* (0.011)	0.068* (0.009)
Acres squared (ACSQ)	0.0000025* (0.0000002)	0.000019* (0.000002)	0.0000031* (0.0000003)	0.000008* (0.000002)
Percent in cultivation (PCTCUL)	490.92* (10.15)	610.48* (14.94)	346.53* (29.95)	462.73* (13.53)
Percent in pasture (PCTPAS)	410.87* (10.60)	528.50* (15.46)	271.01* (28.70)	374.58* (14.11)
Nonfarm influence:[2]				
Slight (SLNFM)	257.87* (6.06)	--	271.07* (14.33)	--
Moderate (MDNFM)	394.70* (9.21)	--	540.96* (18.33)	--
High (HGNFM)	614.29* (26.09)	330.36* (15.24)	912.88* (53.96)	321.78* (13.19)
Irrigation present:[3] (IRR)	85.48¢ (11.79)	--	34.72 (22.77)	117.09* (14.78)
Time (TM)	11.32* (0.57)	11.52* (0.89)	13.01* (1.60)	10.18* (0.73)
Time squared (TMSQ)	-0.031* (0.009)	-0.1011* (0.0145)	0.0674** (0.0265)	-0.0089 (0.0125)
Time cubed (TMCB)	-0.00036** (0.00005)	0.00017** (0.00007)	-0.0012* (0.0001)	-0.00048** (0.00006)
Distance to metropolitan area (DS)	-8.15* (0.31)	-7.57* (0.53)	-12.23** (1.71)	-12.76* (0.48)
Distance to metropolitan area squared (DSSQ)	0.0495** (0.0029)	0.047* (0.006)	0.135* (0.028)	0.0853* (0.0039)
Quality of security:[4]				
Good (SECB)	-219.27* (27.27)	--	-366.17* (42.13)	--
Fair (SECC)	-437.48* (27.10)	--	-606.38* (41.61)	--
Poor (SECD)	-558.74* (27.70)	-216.16* (8.42)	-834.12* (46.97)	-178.69* (7.59)

Continued

TABLE 4 (CONTINUED). BARE LAND VALUE MODELS; FIFTH TRI-STATE REGION AND ALABAMA; LOUISIANA, AND MISSISSIPPI, BASED ON APPRAISAL AND SALES DATA FOR 1976-87

Variable	Model			
	Tri-state	Alabama	Louisiana	Mississippi
Soil grouping:[5]				
Older alluvial, clay alluvial, Delta (ALLUV)	78.97* (7.83)	--	229.92* (16.09)	--
Mississippi terrace, brown loam (MISSBRN)	-137.08* (7.04)	--	--	-202.30* (9.77)
Upper Coastal Plain (UPCOAST)	-159.84* (6.02)	109.05* (10.43)	-49.59* (18.95)	-241.11* (9.22)
Black Belt (BLKBLT)	-213.98* (7.15)	--	--	222.99* (10.68)
Tennessee/Coosa River valley (TENCOS)	-87.62* (8.73)	115.79* (10.92)	--	--
Appalachian (APPAL)	67.67* (8.46)	252.23* (10.33)	--	--
Piedmont (PIED)	-286.37* (14.15)	-53.85* (15.07)	--	--
Red River (REDRIV)	-121.10* (10.79)	--	28.54 (17.65)	--
Coastal Marsh (COASTMAR)	178.72* (30.74	--	488.09* (38.88)	--
Lower Coastal Plain (LOWCOAST)	--	185.94* (9.85)	260.86* (19.38)	-69.04* (10.70)
Enterpise:[6]				
Rice (RICE)	-11.27 (13.28)	--	-110.65** (23.13)	62.19* (20.90)
Corn (CORN)	4.00 (12.45)	-57.53* (13.31)	--	--
Cotton (COT)	80.64* (6.82)	58.20* (14.81)	64.11* (16.23)	135.58* (8.49)
Peanuts (PNUT)	-122.09* (11.37)	-113.29* (12.03)	--	--
Hay (HAY)	90.00* (15.62)	53.88* (19.27)	188.81* (48.07)	--
Cattle (CAT)	89.88* (8.04)	44.82* (11.42)	171.74* (27.10)	80.60* (10.80)
Timber (TIM)	101.45* (8.52)	104.49* (11.79)	31.62 (30.02)	77.50* (11.53)

Continued

TABLE 4 (CONTINUED). BARE LAND VALUE MODELS; FIFTH TRI-STATE REGION AND ALABAMA; LOUISIANA, AND MISSISSIPPI, BASED ON APPRAISAL AND SALES DATA FOR 1976-87

Variable	Model			
	Tri-state	Alabama	Louisiana	Mississippi
Other (OTH)	9.32 (37.36)	50.97 (57.38)	47.97 (62.37)	24.14 (20.90)
State:[7]				
Alabama	-40.66* (6.14)	--	--	--
Louisiana	175.58* (6.48)	--	--	--
R^2	.536	.411	.473	.549
F	1,074*	408*	264*	643*
N	32,565	13,438	7,969	11,106

*, **, *** Significant at .01, .05, and .10 levels, respectively.

[1]Standard errors of coefficients are in parentheses.

[2]No nonfarm influence (NONFM) was used as the base in statistical comparisons for the tri-state and Louisiana models. Because of insufficient data, no nonfarm (NONFM) and slight (SLNFM) influence classes were grouped and used as the base class for the Alabama and Mississippi models and were compared with moderate (MDNFM) and high (HGNFM) nonfarm influences grouped.

[3]Insufficient data were available for estimating the impact of irrigation in the Alabama model.

[4]Excellent quality security (SECA) was used as the base class for statistical comparison in the District and Louisiana models. Because of insufficient data, excellent (SECA) and good (SECB) quality security classes were combined and used as the base class to be compared with a combination of fair (SECC) and poor (SECD) quality security available.

[5]Lower Coastal Plain; Black Belt; Mississippi terrace, brown loam; and older alluvial, clay alluvial, Delta soil types were used as base classes for statistical comparisons in the District, Alabama, Louisiana, and Mississippi models, respectively. Blanks indicate the lack of this soil for the particular location.

[6]Soybeans were used as the base class for statistical comparisons in all models.

[7]Mississippi was used as the base class for statistical comparisons in the District model.

Tract size (AC) had a curvilinear impact on BLVPA in all models. As tract size increased, the marginal impact declined as evidenced by the significant positive quadratic term. Distance to a metropolitan area also evidenced a curvilinear impact on BLVPA, with tracts near metropolitan areas having the highest values. As distance increased, the incremental impact on value declined.

Both percent of tract in cultivation (PCTCUL) and in pasture (PCTPAS) had positive impacts on value relative to incremental allocation of a tract to other uses, table 4. The marginal impact of an additional percent of a tract being devoted to cultivation ranged from $3.47 per acre for the Louisiana model to $6.11 per acre for the Alabama model. Similarly, for additional pasture acreage, the marginal contribution ranged from $2.71 for Louisiana to $5.28 for Alabama.

Nonfarm influences had an important impact on BLVPA, with the contribution to value ranging from $0.00 to $614.29, respectively, for no influence to high influence for the tri-state model and from $0.00 to $912.88 for the Louisiana model. The impact of nonfarm influences was similar for Alabama and Mississippi where tracts with moderate and high nonfarm influences commanded values approximately $325 higher than similar tracts with no or slight nonfarm influences.

Irrigation availability had a significant impact in the tri-state and Mississippi models. For the tri-state, presence of irrigation added $86 to BLVPA, while $117 was added for irrigated tracts in Mississippi.

Variation of BLVPA in relation to time was isolated with the Alabama model including two significant turning points, as was hypothesized. All components of the time variable were significant in the tri-state, Alabama, and Louisiana models. However, signs for the tri-state and Louisiana models were not as expected. Both of the curvilinear components (TMSQ and TMCB) were negative in the tri-state model, while the linear and quadratic terms were both positive for Louisiana.

Availability of high quality farm security had a significant impact on BLVPA with the marginal impacts being ordered as expected. For the tri-state model, presence of excellent security versus poor security added $559 per acre to value. Similarly, availability of excellent quality security for tracts in Louisiana added $834 more to value than for a similar tract with poor quality security available. For Alabama and Mississippi, higher quality security (SECA and SECB) added $216 and $179, respectively, to value relative to comparable tracts with lower quality security (SECC and SECD).

For the tri-state, tracts with primarily older alluvial, clay alluvial, and Delta; Appalachian; and Coastal Marsh soils had values which were $79, $68, and $179 higher than values noted for similar tracts in counties with primarily Lower Coastal Plain soil types. Values ranged from $88 (Tennessee and Coosa River valleys) to $286 (Piedmont) less than the base (Lower Coastal Plain) for other soil types. Primary soil type on a tract also contributed significantly to value in individual state models.

For the tri-state, tracts which had cotton ($81), hay ($90), cattle ($90), or timber ($102) as primary enterprises had values which were higher than those for tracts on which soybeans were the major enterprise. Contrary to expectations, tracts with peanuts as the primary enterprise had values that were $122 less than for tracts having primarily soybeans. For Alabama, relative to soybeans as the primary enterprise on a tract, cotton, hay, cattle, and timber added to value while corn and peanuts reduced value. For Louisiana, presence of cotton, hay, cattle, and timber contributed to the value of a tract in comparison to tracts with soybeans as the primary enterprise. Presence of rice, cotton, cattle, and timber added to value of a tract in the Mississippi model when compared to tracts with primarily soybeans. Several of these relationships were counter to expectations.

At the tri-state level, BLVPA was $176 higher for tracts located in Louisiana when compared to similar tracts in Mississippi. Comparable Alabama tracts were $41 less than similar Mississippi tracts.

Land Market Areas

Models for the respective land market areas for Alabama performed satisfactorily in analyzing the impact of specified characteristics on bare land values, table 5. Structural quality of the models was good, with many significant variables and correct specified signs. Explanatory power of the models ranged from 35 percent for the Piedmont area model to 44 percent for the Lower Coastal Plain model. Parameter estimates for most variables were fairly stable among models estimated.

Size of tract (AC) had a curvilinear impact on BLVPA. Smaller tracts had the highest value and value declined by a decreasing amount as tract size increased. Adjustment of value over the time period analyzed was curvilinear for all areas except the Piedmont region, where there was no significant variation in value with respect to time. Significant downturns and upturns were isolated for the Upper and Lower Coastal Plain models. While the Black Belt, Tennessee and Coosa River valleys, and Appalachia models isolated the downturn in values, significant upturns were not identified for the time period analyzed.

A curvilinear relationship between BLVPA and distance was isolated for the Upper and Lower Coastal Plain, Black Belt, and Tennessee and Coosa River valleys models, table 5. Value declined at a decreasing rate for these areas. In the Appalachia region, value per acre declined by $15.70 for each additional mile from the nearest metropolitan area. A significant relationship between value and distance was not isolated for the Piedmont region.

Presence of cultivatable and pasture land on a tract contributed positively to BLVPA in all areas, table 5. Each additional percentage of a tract in cultivatable land added from $3.33 per acre in

TABLE 5. LAND VALUE MODELS, LAND MARKET AREAS, ALABAMA, 1976-87

Land market area	Parameter estimates and statistics[1]														
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	DS	DSSQ	R^2
Upper Coastal Plain	572.5	-0.449	.000099	410.2	578.6	28.3	-14.6	381.5	-393.3	18.0	-0.184	.00052	-10.7	.2029	.36
	(7.4)[2]	(-7.0)	(5.7)	(11.3)	(12.4)	(1.0)	(-0.4)	(14.0)	(-9.8)	(6.4)	(-4.0)	(2.3)	(-3.8)	(4.4)	
Lower Coastal Plain	1247.5	-0.200	.000017	699.0	577.7	-47.2	-272.7	377.1	-486.8	15.3	-0.154	.00034	-22.0	.1629	.44
	(20.1)	(-6.7)	(5.3)	(31.9)	(15.5)	(-1.9)	(-18.4)	(19.8)	(-12.2)	(7.5)	(-4.7)	(2.2)	(-16.1)	(11.5)	
Black Belt	965.7	-0.21	.00004	332.7	429.4	-78.0	51.9	230.7	-513.9	13.6	-0.116	.00015	-16.8	.1894	.37
	(12.2)	(-7.9)	(6.7)	(12.0)	(11.3)	(-2.8)	(0.6)	(10.0)	(-12.75)	(5.6)	(-2.9)	(0.82)	(-6.3)	(6.0)	
Tennessee and Coosa River valleys	806.7	-1.33	.00052	703.7	591.8	106.8	53.9	397.4	-511.6	13.7	-0.092	.00004	-21.9	.5315	.40
	(11.5)	(-13.7)	(8.5)	(20.2)	(13.1)	(3.4)	(0.8)	(17.0)	(-14.0)	(4.6)	(-1.89)	(0.19)	(-5.7)	(4.3)	
Appalachia	1194.6	-1.18	.00019	486.4	533.0	-2.0	-38.9	539.5	-491.3	15.1	-0.116	.00017	-15.7	.0631	.41
	(14.2)	(-12.6)	(9.4)	(12.2)	(11.2)	(-0.1)	(-1.2)	(21.5)	(-10.6)	(4.8)	(-2.2)	(0.6)	(-4.6)	(1.1)	
Piedmont	466.5	-0.25	.00008	429.8	403.9	-18.9	-34.4	210.3	-226.6	4.5	-0.012	.00011	-5.9	.1117	.35
	(2.3)	(-3.2)	(3.1)	(5.2)	(7.9)	(-0.6)	(-0.4)	(5.1)	(-2.7)	(1.4)	(-0.2)	(-0.4)	(-0.6)	(0.7)	

[1]INT is intercept; AC is size in acres; ACSQ is AC squared; PCTCUL is percentage of the tract in cultivation; PCTPAS is percentage of a track in pasture; CAT and OTH are production of cattle and other enterprises on the tract (crop production is the base); SECPR is poor quality security available (higher quality security is the base); RINF is a strong rural influence present (strong urban influence is the base); TM, TMSQ, and TMCB are time, time squared and time cubed; DS represents distance to a metropolitan area and DSSQ is DS squared; and R^2 is the coefficient of determination.

[2]Values in parenthesis are t statistics.

the Black Belt region up to $7.04 per acre in the Tennessee and Coosa valleys region. Availability of an additional percent of pasture acreage on a tract added from $4.04 per acre in the Piedmont region to $5.92 per acre in the Tennessee and Coosa River valleys region.

Production of cattle rather than crops resulted in BLVPA being $47 and $78 less on tracts in the Lower Coastal Plain and Black Belt regions, respectively, table 5. Relative to crop production in the Tennessee and Coosa River valleys region, cattle production enhanced value by $107 per acre. Similarly, for the Lower Coastal Plain region, tracts primarily devoted to other enterprises (timber) had values which were $273 per acre less than for comparable tracts which were allocated to crop production.

Availability of good quality security on a tract enhanced value for all regions. Contributions ranged from $210 per acre for tracts in the Piedmont region to $540 per acre in the Appalachia area. Strong rural influences adversely affected value. Tracts lacking non-farm influences had values ranging from $227 per acre less for the Piedmont region to $514 per acre less for the Black Belt region.

Counties

Quality of the county land value models varied substantially, table 6. Explanatory power of the models ranged from 15 percent for Conecuh County to 81 percent for Cleburne County. Significance of variables also differed among models, with some models having few significant variables and others with most variables being significant.

Most models identified a curvilinear relationship between tract size (AC) and BLVPA, and values declined at a decreasing rate as tract size increased, table 6. Exceptions to the curvilinear relationship were Autauga, Clay, Conecuh, Covington, Etowah, and Mobile county models, which isolated negative linear impacts ranging from $0.24 to $2.13 per acre and the Baldwin, Barbour, Bullock, Choctaw, Clarke, Crenshaw, Greene, Jefferson, Perry, Pickens, Randolph, Tallapoosa, Walker, Wilcox, and Winston county models which identified no impact of tract size on value per acre.

Percent of a tract in cultivation (PCTCUL) had a positive impact on BLVPA in all county models except for Autauga, Bibb, Bullock, Chambers, Choctaw, Clarke, Clay, Conecuh, Coosa, Fayette, Greene, Jefferson, Lee, Marion, Russell, St. Clair, Shelby, Tuscaloosa, Walker, and Washington counties, table 6. Impacts ranged from $1.74 per acre in Sumter County to $14.06 per acre

TABLE 6. COUNTY LAND VALUE MODELS, ALABAMA, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
Autauga	625.28	-0.31	0.00001	271.39	839.93	-88.85	142.7	-570.88	-525.6	6.74	-0.025	-0.00008	.55
	(2.61)[2]	(-1.89)	(1.20)	(1.57)	(5.11)	(-0.80)	(1.29)	(-6.29)	(-4.51)	(0.66)	(-0.15)	(-0.10)	
Baldwin	989.86	-0.52	.00031	989.48	918.68	-31.55	507.3	-435.99	-884.12	19.49	-0.244	0.00078	.32
	(4.04)	(-1.01)	(0.61)	(6.23)	(4.76)	(-0.24)	(3.57)	(-4.03)	(-4.63)	(2.45)	(-1.70)	(1.12)	
Barbour	602.95	0.03	.00000	500.5	328.02	61.12	17.42	-356.9	-378.04	-2.52	0.114	-0.00079	.48
	(4.72)	(0.55)	(0.08)	(5.82)	(4.36)	(1.42)	(0.35)	(-5.28)	(-5.59)	(-0.47)	(1.31)	(-1.88)	
Bibb	-111.45	-0.91	.00037	362.23	518.17	102.63	30.29	-551.84	-103.7	44.96	-0.584	0.00212	.46
	(-0.22)	(-3.25)	(2.78)	(1.05)	(2.43)	(0.56)	(0.18)	(-3.81)	(-0.24)	(4.57)	(-3.66)	(2.78)	
Blount	181.33	-0.63	.00009	542.01	714.64	-76.62	142.95	-496.29	9.93	11.98	-0.075	-0.00003	.44
	(0.81)	(-4.48)	(3.61)	(4.99)	(6.45)	(-1.01)	(1.77)	(-8.06)	(0.05)	(2.03)	(-0.73)	(-0.05)	
Bullock	-206.58	-0.08	.00003	117.9	475.54	-177.92	-9.5	-425.79	141.53	22.36	-0.321	0.00142	.41
	(-0.53)	(-0.58)	(0.80)	(0.68)	(3.77)	(-1.48)	(-0.08)	(-4.00)	(0.57)	(1.72)	(-1.68)	(1.66)	
Butler	450.22	-2.38	.00305	253.82	385.47	-34.59	119.62	-534.84	-244.64	20.47	-0.244	0.00079	.29
	(1.79)	(-4.15)	(3.20)	(1.71)	(3.01)	(-0.39)	(1.31)	(-5.55)	(-1.32)	(2.56)	(-1.84)	(1.21)	
Calhoun	717.78	-3.45	.00471	400.5	419.17	49.21	-178.17	-355.19	-183.88	14.02	-0.157	0.00058	.53
	(3.58)	(-4.90)	(4.19)	(2.74)	(2.84)	(0.51)	(-1.75)	(-4.56)	(-1.76)	(1.62)	(-1.05)	(0.76)	
Chambers	201.12	-0.22	.00006	-77.86	196.87	-63.53	-142.29	-344.92	231.86	1.89	0.024	-0.00029	.31
	(0.88)	(-1.88)	(1.68)	(-0.37)	(1.89)	(-0.51)	(-1.23)	(-5.08)	(1.35)	(0.33)	(0.23)	(-0.53)	
Cherokee	-98.05	-2.01	.00149	581.15	3.82	239.15	-0.85	-515.38	216.18	28.08	-0.373	0.00134	.37
	(-0.18)	(-3.15)	(2.28)	(2.98)	(0.02)	(1.40)	(-0.01)	(-4.49)	(0.60)	(1.76)	(-1.49)	(1.14)	
Chilton	305.64	-2.05	.00163	491.2	569.68	91.23	-15.63	-225.4	-263.61	31.29	-0.415	0.00162	.40
	(1.55)	(-5.39)	(3.81)	(3.66)	(5.51)	(1.23)	(-0.19)	(-3.50)	(-1.66)	(5.68)	(-4.44)	(3.52)	
Choctaw	-68.41	-0.01	-0.0001	706.38	281.0	32.36	101.98	-27.62	---	19.3	-0.237	0.0008	.36
	(-0.37)	(-0.05)	(-0.18)	(1.52)	(2.48)	(0.25)	(0.84)	(-0.42)	---	(2.66)	(-2.12)	(1.58)	

Continued

Table 6 (Continued). County Land Value Models, Alabama, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
Clarke	565.92	-0.06	0.00000	352.38	184.2	130.94	99.49	-367.16	---	-18.22	0.431	-0.00249	.30
	(0.87)	(-0.04)	(0.12)	(0.69)	(0.84)	(0.46)	(0.34)	(-2.23)	---	(-0.66)	(1.01)	(-1.24)	
Clay	1,233.94	-2.05	.00483	444.03	380.32	-292.4	-255.14	-139.72	-734.42	5.63	0.011	-0.00047	.49
	(4.35)	(-1.86)	(1.54)	(1.11)	(2.68)	(-1.91)	(-1.72)	(-1.22)	(-3.49)	(0.73)	(0.07)	(-0.54)	
Cleburne	328.8	-1.32	.00189	1,255.58	89.74	345.62	187.36	---	---	-11.38	0.233	-0.00121	.81
	(1.70)	(-3.62)	(2.95)	(4.80)	(1.23)	(3.39)	(1.87)	---	---	(-1.23)	(1.46)	(-1.44)	
Coffee	331.9	-0.85	.00084	412.74	435.26	-46.46	-38.59	-223.33	-197.45	14.67	-0.136	0.00028	.40
	(2.31)	(-3.74)	(3.03)	(6.58)	(4.49)	(-0.87)	(-0.78)	(-5.10)	(-1.69)	(3.52)	(-1.92)	(0.79)	
Colbert	178.08	-1.90	.00121	639.16	991.74	-131.11	93.78	-481.06	-198.96	8.05	0.185	-0.00181	.50
	(0.49)	(-3.77)	(2.73)	(3.63)	(5.10)	(-0.91)	(0.46)	(-5.79)	(-1.3)	(0.47)	(0.67)	(-1.35)	
Conecuh	362.24	-0.67	.00058	225.59	102.75	127.97	-21.49	-30.03	---	7.61	-0.49	-0.0003	.15
	(2.03)	(-1.64)	(1.07)	(1.62)	(0.72)	(1.31)	(-0.23)	(-0.30)	---	(0.93)	(-0.36)	(-0.04)	
Coosa	69.87	-1.09	.00163	309.92	546.22	27.39	26.41	26.69	-14.23	10.7	-0.076	-0.00000	.57
	(0.24)	(-1.93)	(1.81)	(0.93)	(4.33)	(0.24)	(0.22)	(0.24)	(-0.07)	(1.31)	(-0.58)	(-0.00)	
Covington	171.88	-0.89	.00054	341.76	348.83	69.78	-30.04	-380.01	---	14.63	-0.154	0.000372	.42
	(1.81)	(-3.09)	(1.14)	(5.51)	(4.19)	(1.25)	(-0.56)	(-9.79)	---	(3.60)	(-2.45)	(1.27)	
Crenshaw	-29.84	-0.11	.00007	493.65	363.58	80.8	74.66	-166.28	---	11.22	-0.075	-0.00005	.32
	(-0.20)	(-0.46)	(0.48)	(4.48)	(3.18)	(1.27)	(1.13)	(-2.55)	---	(1.61)	(-0.67)	(-0.09)	
Cullman	533.49	-3.95	.00532	669.67	462.6	57.74	20.07	-457.28	-464.71	28.44	-0.309	0.00104	.35
	(2.16)	(-5.30)	(3.19)	(4.62)	(4.03)	(0.74)	(0.16)	(-8.52)	(-3.08)	(3.26)	(-2.23)	(1.57)	
Dale	533.35	-1.09	.00089	691.18	544.02	34.66	24.85	-282.45	-430.33	13.28	-0.093	-0.00001	.60
	(2.81)	(-3.16)	(2.42)	(6.72)	(4.57)	(0.44)	(0.36)	(-6.08)	(-4.95)	(1.85)	(-0.80)	(-0.02)	
Dallas	339.53	-0.06	0.00002	312.42	324.00	14.73	24.37	-196.78	-306.55	24.91	-0.295	0.00092	.29
	(2.11)	(-2.97)	(2.48)	(3.06)	(2.79)	(0.19)	(0.30)	(-2.51)	(-3.21)	(-4.20)	(-3.07)	(2.00)	

Continued

TABLE 6 (CONTINUED). COUNTY LAND VALUE MODELS, ALABAMA, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
DeKalb	797.83	-4.72	.00846	473.37	341.18	37.4	73.6	-704.72	-524.9	17.39	-0.115	-0.00000	.49
	(4.23)	(-6.60)	(4.44)	(5.13)	(3.50)	(.60)	(.61)	(-14.83)	(-4.03)	(2.97)	(-1.22)	(-0.00)	
Elmore	476.31	-0.84	.00042	761.07	270.58	230.87	69.48	-467.	-473.41	16.02	-0.158	.00043	.51
	(2.48)	(-3.28)	(2.56)	(5.44)	(2.07)	(2.46)	(0.70)	(-6.70)	(-5.62)	(2.15)	(-1.25)	(0.67)	
Escambia	198.04	-1.08	.00094	874.93	1257.33	-138.42	96.76	-208.59	-303.34	17.21	-0.123	.00009	.51
	(0.84)	(-2.41)	(2.16)	(6.23)	(5.68)	(-0.88)	(0.73)	(-3.20)	(-1.90)	(2.34)	(-0.98)	(0.15)	
Etowah	926.22	-2.13	.0072	455.79	562.98	217.48	-157.6	-830.6	-522.95	11.38	-0.091	.0001	.59
	(3.06)	(-2.78)	(1.22)	(1.96)	(2.77)	(1.45)	(-1.11)	(-6.54)	(-4.53)	(0.84)	(-0.41)	(0.09)	
Fayette	1450.81	-3.17	.00415	548.76	484.38	-17.44	63.9	-903.04	-139.9	-55.37	1.20	-0.00698	.55
	(2.10)	(-2.76)	(2.19)	(1.28)	(1.24)	(-0.08)	(0.34)	(-4.47)	(-0.54)	(-1.88)	(2.53)	(-2.98)	
Franklin	1000.64	-0.98	.00073	643.35	622.2	48.83	13.62	-225.89	-1,189.82	20.63	-0.17	.00021	.48
	(3.68)	(-3.38)	(2.70)	(5.70)	(5.78)	(0.63)	(0.14)	(-3.92)	(-5.93)	(2.47)	(-1.28)	(0.33)	
Geneva	109.62	-1.12	.00059	543.4	658.89	-29.22	107.27	-303.16	-42.52	15.19	-0.115	.00006	.38
	(0.48)	(-6.83)	(4.49)	(8.63)	(6.99)	(-0.47)	(1.22)	(-7.46)	(-0.20)	(3.72)	(-1.62)	(0.17)	
Greene	53.04	-0.141	-0.00002	203.87	306.95	27.92	-50.89	-403.07	---	-12.31	-0.061	-0.00024	.48
	(0.28)	(-0.57)	(-0.08)	(1.39)	(1.97)	(0.29)	(-0.50)	(-3.88)	---	(-1.43)	(0.41)	(-0.32)	
Hale	1260.38	-0.26	.00008	199.85	256.22	47.39	-176.34	-140.41	-971.32	10.29	-0.069	-0.00009	.60
	(8.08)	(-2.62)	(2.22)	(2.27)	(23.83)	(0.73)	(-2.44)	(-3.41)	(-8.83)	(2.27)	(-0.93)	(-0.24)	
Henry	156.77	-0.36	.00024	919.5	835.03	-88.05	39.2	-169.57	-119.51	9.04	-0.081	.00015	.52
	(0.91)	(-2.01)	(2.12)	(8.56)	(6.53)	(-0.98)	(0.47)	(-2.68)	(-1.16)	(1.49)	(-0.81)	(0.31)	
Houston	957.14	-0.94	.00059	532.31	513.85	330.66	-148.95	-353.07	-751.44	16.3	-0.141	.00022	.59
	(6.52)	(-3.45)	(2.67)	(5.22)	(4.41)	(3.58)	(-1.43)	(-6.68)	(-10.66)	(2.91)	(-1.55)	(0.51)	
Jackson	494.13	-1.96	0.0014	635.6	694.79	-29.04	-39.13	-795.88	-143.79	6.34	-0.039	0.00003	.44
	(1.74)	(-4.22)	(3.00)	(4.29)	(3.79)	(-0.26)	(-0.28)	(-5.90)	(-0.83)	(0.62)	(-0.24)	(0.04)	

Continued

TABLE 6 (CONTINUED). COUNTY LAND VALUE MODELS, ALABAMA, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
Jefferson	1532.19	-1.83	.00041	504.23	685.65	-190.4	-198.2	-754.16	-493.16	-8.36	0.228	-0.00122	.50
	(2.53)	(-0.73)	(0.09)	(0.64)	(1.59)	(-0.66)	(-0.55)	(-3.70)	(-2.52)	(-0.29)	(0.44)	(-0.45)	
Lamar	507.91	-2.51	.00381	811.88	500.1	262.48	-4.29	-8.61	-107.69	-8.85	0.348	-0.00218	.48
	(0.84)	(-2.21)	(2.01)	(1.74)	(2.10)	(1.27)	(-0.02)	(-0.06)	(-0.63)	(-0.85)	(-1.16)		
Lauderdale	583.59	-1.41	.00051	706.47	686.51	117.81	96.78	-395.51	-777.37	28.47	-0.302	0.00089	.38
	(2.40)	(-4.04)	(3.15)	(5.19)	(4.66)	(1.16)	(0.56)	(-5.89)	(-5.57)	(3.13)	(-2.03)	(1.22)	
Lawrence	358.4	-1.80	.00163	643.89	618.71	79.92	-131.81	-448.22	-293.72	15.675	-0.076	-0.00028	.37
	(1.24)	(-3.71)	(2.56)	(4.91)	(4.61)	(0.82)	(-0.86)	(-6.75)	(-1.69)	(1.56)	(-0.50)	(-0.39)	
Lee	732.54	-1.92	.00142	-196.4	339.01	-74.1	-173.41	-489.59	-20.92	2.06	0.071	-0.00062	.32
	(3.01)	(-4.31)	(3.45)	(-0.91)	(1.85)	(-0.53)	(-1.29)	(-4.87)	(-0.21)	(0.22)	(0.45)	(-0.77)	
Limestone	486.12	-1.81	.00163	801.72	713.84	-75.48	325.71	-333.13	-339.97	11.3	-0.04	-0.00022	.39
	(1.91)	(-4.46)	(2.80)	(7.18)	(5.22)	(-0.85)	(1.15)	(-5.44)	(-1.91)	(1.67)	(-0.34)	(-0.38)	
Lowndes	519.47	-0.29	.00009	382.98	516.28	-89.75	102.53	-84.46	-262.59	3.84	0.001	-0.00024	.31
	(2.43)	(-3.05)	(2.76)	(3.24)	(6.04)	(-1.13)	(1.06)	(-1.50)	(-1.41)	(0.63)	(0.01)	(-0.53)	
Macon	508.28	-0.169	.00003	368.29	268.53	-46.43	-17.84	-83.47	-233.23	1.65	0.026	-0.00028	.38
	(4.75)	(-2.06)	(1.71)	(3.71)	(2.88)	(-0.76)	(-0.30)	(-1.67)	(-3.19)	(0.39)	(0.37)	(-0.81)	
Madison	980.86	-2.61	.00182	579.15	622.9	59.22	-68.88	-454.09	-570.84	15.59	-0.171	0.00078	.46
	(5.81)	(-6.82)	(4.75)	(4.85)	(4.18)	(0.61)	(-0.44)	(-6.91)	(-9.28)	(2.19)	(-1.42)	(1.32)	
Marengo	57.73	-0.36	.00011	371.59	663.22	-92.53	77.30	-387.69	-183.98	24.32	-0.267	0.00074	.43
	(0.23)	(-2.86)	(2.31)	(2.21)	(4.08)	(-0.72)	(0.57)	(-5.89)	(-1.09)	(3.03)	(-1.94)	(1.10)	
Marion	918.67	-4.41	.00629	308.05	381.24	184.94	-61.74	-655.32	-744.48	10.2	0.123	-0.00154	.53
	(2.54)	(-4.17)	(3.28)	(1.38)	(1.82)	(1.26)	(-0.45)	(-6.34)	(-2.89)	(0.82)	(0.58)	(-1.43)	
Marshall	674.02	-3.56	0.00329	640.58	701.42	-52.68	148.21	-568.02	-382.74	15.18	-0.119	0.00021	.46
	(3.09)	(-6.03)	(4.78)	(5.43)	(6.05)	(-0.68)	(1.29)	(-11.34)	(-2.37)	(2.18)	(-1.01)	(0.34)	

Continued

TABLE 6 (CONTINUED). COUNTY LAND VALUE MODELS, ALABAMA, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
Mobile	1,112.57	-0.24	.00002	892.14	632.55	-8.34	-126.11	-278.52	-513.81	17.81	-0.11	-0.00011	.47
	(2.05)	(-1.64)	(1.32)	(3.67)	(2.10)	(-0.04)	(-0.65)	(-2.48)	(-3.01)	(0.79)	(-0.34)	(-0.08)	
Monroe	476.28	-0.33	.0003	696.58	640.89	-0.60	73.55	-163.81	-357.74	16.64	-0.17	.00038	.44
	(2.63)	(-3.36)	(3.17)	(5.69)	(5.01)	(-0.61)	(0.82)	(-2.83)	(3.54)	(2.50)	(-1.55)	(0.70)	
Montgomery	782.84	-0.44	.00006	302.04	563.65	-245.58	-116.58	-365.46	-535.18	9.57	0.013	-0.00053	.42
	(2.73)	(-4.59)	(3.77)	(1.69)	(4.32)	(-1.98)	(-0.81)	(-5.08)	(-6.25)	(0.82)	(0.08)	(-0.66)	
Morgan	1172.47	-1.48	.00049	467.79	461.15	-22.02	84.77	-291.88	-751.94	4.14	0.066	-0.00068	.32
	(4.66)	(-4.45)	(3.50)	(2.90)	(3.34)	(-0.23)	(0.50)	(-4.04)	(-4.65)	(0.53)	(0.48)	(-0.98)	
Perry	10.87	-0.06	.00001	434.46	261.33	77.00	67.50	-5.68	---	13.61	-0.065	-0.0003	.37
	(0.09)	(-0.89)	(0.86)	(5.14)	(2.76)	(1.04)	(0.91)	(-0.07)	---	(2.59)	(-0.76)	(-0.73)	
Pickens	-91.1	-0.01	-.00000	471.97	679.06	-157.18	-24.2	-43.57	156.39	16.27	-0.173	.00048	.52
	(-0.41)	(-0.12)	(-0.08)	(4.69)	(5.95)	(-2.17)	(-0.46)	(-0.65)	(0.83)	(2.63)	(-1.72)	(0.96)	
Pike	665.07	-0.89	.008	261.37	264.1	95.55	-2.00	-498.42	-441.45	11.2	-0.122	.00034	.44
	(3.47)	(-3.39)	(2.70)	(2.41)	(2.27)	(1.64)	(-0.03)	(-6.74)	(-3.72)	(1.50)	(-1.04)	(0.62)	
Randolph	137.66	-0.15	-0.00012	248.65	325.76	-84.25	-59.39	-421.95	---	4.44	0.033	-0.00047	.60
	(1.33)	(-0.27)	(-0.09)	(1.70)	(4.93)	(-1.00)	(-0.73)	(-5.85)	(-3.72)	(0.99)	(0.41)	(-1.11)	
Russell	-244.11	-0.21	.00005	66.24	192.93	184.71	3.56	-426.19	274.79	20.89	-0.272	.00113	.38
	(-0.61)	(-1.83)	(1.68)	(0.30)	(1.02)	(1.58)	(0.04)	(-4.81)	(1.15)	(1.63)	(-1.39)	(1.22)	
St. Clair	1251.1	-4.31	.00612	18.76	303.26	118.87	-301.8	-264.66	-245.5	-0.38	0.083	-0.00055	.48
	(2.95)	(-3.83)	(2.55)	(0.05)	(1.66)	(0.70)	(-1.70)	(-2.19)	(-1.65)	(-0.02)	(0.32)	(-0.46)	
Shelby	846.9	-2.00	.0009	192.11	87.29	461.06	42.86	-9.69	-604.41	35.99	-0.398	.00136	.47
	(2.80)	(-4.00)	(2.55)	(0.71)	(0.45)	(3.12)	(0.27)	(-0.09)	(-5.44)	(2.77)	(-1.86)	(1.31)	

Continued

TABLE 6 (CONTINUED). COUNTY LAND VALUE MODELS, ALABAMA, 1976-87

County	Parameter Estimates and Statistics[1]												
	INT	AC	ACSQ	PCTCUL	PCTPAS	CAT	OTH	SECPR	RINF	TM	TMSQ	TMCB	R^2
Sumter	137.80	-0.37	0.00022	174.37	173.71	-20.74	-45.04	-93.81	---	16.01	-0.16	0.00036	.41
	(0.75)	(-3.07)	2.65)	(2.29)	(2.21)	(-0.32)	(-0.69)	(-1.43)	---	(2.01)	(-1.45)	(0.77)	
Talladega	341.38	-1.11	.00045	503.09	373.8	197.68	94.96	-320.2	-396.69	17.86	-0.143	.00029	.40
	(1.33)	(-4.95)	(3.42)	(3.51)	(3.02)	(2.31)	(0.80)	(-4.72)	(3.83)	(1.70)	(-0.87)	(0.38)	
Tallapoosa	-368.42	-0.19	.00006	1,406.01	691.12	512.77	670.11	-53.19	-257.9	10.87	-0.116	.00046	.47
	(-0.98)	(-1.07)	(1.02)	(3.87)	(4.89)	(1.95)	(2.63)	(-0.52)	(-1.58)	(1.24)	(-0.81)	(0.66)	
Tuscaloosa	1177.62	-0.88	.00051	80.8	965.27	-221.02	-93.52	-451.65	-658.3	9.36	-0.141	.00070	.56
	(4.52)	(-2.67)	(1.79)	(0.36)	(5.72)	(-1.67)	(-0.79)	(-4.03)	(-7.58)	(0.89)	(-0.85)	(0.89)	
Walker	412.04	-3.53	.00528	232.17	223.42	344.5	153.98	-763.38	-235.31	25.3	-0.369	.00177	.43
	(0.76)	(-1.61)	(1.32)	(0.52)	(0.58)	(1.09)	(0.54)	(-4.20)	(-1.20)	(1.15)	(-0.97)	(0.89)	
Washington	538.67	-0.67	.00036	408.92	371.37	12.17	-9.27	-383.63	---	-4.75	0.176	-0.00123	.29
	(91.26)	(-2.09)	(2.31)	(1.04)	(1.03)	(0.05)	(-0.04)	(-2.06)	---	(-0.26)	(0.60)	(-0.91)	
Wilcox	-85.86	-0.22	.00004	287.77	193.24	38.99	-22.69	-608.28	-155.05	35.94	-0.445	.00154	.39
	(-0.32)	(-2.33)	(1.46)	(2.32)	(1.66)	(0.42)	(-0.27)	(-3.92)	(-0.90)	(3.91)	(-3.10)	(2.25)	
Winston	539.74	-1.04	-0.00063	543.61	883.34	-58.21	84.69	-288.53	-798.92	33.8	-0.529	.00259	.48
	(1.44)	(-1.15)	(-0.51)	(2.21)	(4.61)	(-0.47)	(0.69)	(-2.84)	(-5.78)	(2.13)	(-2.10)	(2.12)	

[1]INT is intercept; AC is size in acres; ACSQ is AC squared; PCTCUL is percentage of the tract in cultivation; PCTPAS is percentage of a tract pasture; CAT and OTH are production of cattle and other enterprises (primarily timber) on the tract (crop production is the base); SECPR is lower quality security available (higher quality security is the base); RINF is a strong rural influence present (strong urban influence is the base); TM, TMSQ, and TMCB are time, time squared and time cubed; and R^2 is the coefficient of determination.

[2]Values in parentheses are t statistics.

in Tallapoosa County for each additional percent of a tract in cultivatable land. The percent of pastureland (PCTPAS) on a tract had a significant positive impact on value in all county models except Cherokee, Clark, Cleburne, Conecuh, Fayette, Jefferson, Russell, Shelby, Walker, and Washington. Each additional percentage of a tract allocated to pastureland added from $1.74 per acre to value in Sumter County to $12.57 in Escambia County.

Presence of the cattle enterprise (CAT) on a tract relative to crop enterprises had a significant impact in Clay, Cleburne, Elmore, Houston, Montgomery, Pickens, Pike, Shelby, Talladega, Tallapoosa, and Tuscaloosa county models, table 6. Estimates ranged from a negative $346 per acre impact in Cleburne County to a positive $513 impact in Tallapoosa County. Similarly, a significant coefficient was noted for the other enterprise (primarily timber) variable (OTH) in the Baldwin, Blount, Calhoun, Clay, Cleburne, Hale, and Tallapoosa county models. Relative to tracts with crop enterprises being primary, tracts with primarily 'other' enterprises in these counties had values which ranged from $255 per acre less in Clay County to $670 more in Tallapoosa County.

Availability of high quality security (SECGD) on a tract had a significant positive impact on BLVPA in models for all counties except Choctaw, Clay, Conecuh, Coosa, Lamar, Lowndes, Perry, Pickens, Shelby, Sumter, and Tallapoosa, table 6. Impacts ranged from $83 per acre in Macon County to $903 per acre in Fayette County.

The impact of nonfarm influences was evaluated using the rural influence (RINF) variable. Several counties (Choctaw, Clarke, Cleburne, Conecuh, Covington, Crenshaw, Greene, Perry, Randolph, Sumter, and Washington) were judged to be basically rural and, thus, this variable was excluded from these models. In the remaining counties for which the impact of rural versus nonfarm influences was evaluated, impacts were judged to be insignificant for Bibb, Blount, Bullock, Butler, Chambers, Cherokee, Colbert, Coosa, Fayette, Geneva, Henry, Jackson, Lamar, Lee, Lowndes, Marengo, Marion, Pickens, Russell, Tallapoosa, Walker, and Wilcox counties, table 6. For the remaining county models, negative impacts were isolated, with the range being from $184 per acre in Calhoun County to $1,190 per acre in Franklin County.

A time variable with curvilinear components was included in the model to evaluate change in BLVPA over time. Models for Baldwin, Butler, Choctaw, Coffee, Covington, Cullman, Lauderdale, Marengo, Pickens, and Shelby counties included significant coefficients for the linear and quadratic components which reflected the increase in value in the 1970's and the downturn in values identified in the early 1980's, table 6. The Bibb, Bullock, Chilton, Dallas, Wilcox, and Winston county models had significant variables for all three time components, which indicated statistical support for bottoming-out and increasing land values in these counties. Most counties showed no significant systematic variation in BLVPA for the time period analyzed.

SUMMARY

Alabama's rural land market was analyzed using a data base for 1976 through 1987. Models for the tri-state and Louisiana and Mississippi were estimated to compare with the estimated Alabama model. Alabama was divided into land market areas based on primary soil type and agricultural activity. Descriptive statistics and statistical models were estimated for these groupings and on a county basis to evaluate the status of the land market and potential changes.

Much variability in land values was noted for the 1976-87 period. Values tended to increase through the 1970's, to peak in the early 1980's, and decline until stabilizing tendencies were noted in 1987. Values peaked in 1980 in Alabama and in 1981 in Louisiana and Mississippi. By 1986, values in all three states had declined to levels commensurate with 1976 values. For the land market areas analyzed, values peaked for all except the Appalachia area in 1981. Values for the Appalachia area peaked in 1980.

The pattern of variability in values among Alabama counties was similar though peaks did not consistently occur in the same year. Twenty-two counties had peak values in 1981, while 15 and 11 counties had their highest values in 1980 and 1982, respectively. On a county-by-county basis, the highest values were noted in Baldwin, Jefferson, Madison, Mobile, and Shelby counties, areas with strong nonagricultural influences. The lowest values were experienced in Bullock, Cleburne, Coosa, Crenshaw, Randolph, and Tallapoosa counties.

The tri-state, state, and land market area models showed good structural quality, and most variables were significant and had correct expected signs. From the standpoint of explanatory power, these models were of reasonable quality, with coefficients of determination being approximately 50 percent for the tri-state and state models and 35-45 percent for the land market area models. Quality of the county models was less consistent, though some county models showed good explanatory power.

BLVPA was found to vary in a curvilinear fashion in response to tract size, distance to a metropolitan area, and time adjustment in the more aggregated models and for several of the county models. The marginal impact of distance to a metropolitan area and size of a tract on value declined as size and distance increased. The Alabama model, the Upper and Lower Coastal Plain land market area models, and the Bibb, Bullock, Chilton, Dallas, Wilcox, and Winston county models had the only time adjustment variable with two significant turning points which reflected the increasing values in the 1970's, the decline in values in the early 1980's, and the recent flattening and upturn in values. While other models had significant components for this variable, none were totally as expected. Thus, for the 1976-87 data base and period of analysis, statistical results tend to indicate a bottoming-out and an upturn in values.

Strong rural versus nonfarm influences affected values. For the tri-state model, the impact ranged from $0.00 for no nonfarm influences to $614 per acre for a high nonfarm influence on a tract. The impact of nonfarm influences was similar for the Alabama and Mississippi models, with tracts with moderate and high nonfarm influences commanding values which were approximately $325 per acre higher than for similar tracts with no or slight nonfarm influences. On the county basis, tracts with strong rural influences had values that ranged from $184 (Calhoun County) to $1,190 (Franklin County) less than for similar tracts with strong nonfarm influences.

Quality and condition of the tract, along with its potential, had an important impact on value. Impacts of availability of good and high quality security ranged from $83 per acre in Macon County to $903 per acre in Fayette County for the county models, from $210 per acre in the Piedmont market area to $540 per acre in the Appalachia area, and $330 per acre in the Alabama model. Increased allocation of a tract to cultivation and pasture, in contrast to timber usage, enhanced value in most aggregated and county models. The type of enterprise that a tract was primarily allocated to affected value in several of the aggregated models, with the more intensive, income-generating enterprises, such as cotton, cattle, and hay, generally having the largest positive impacts.

CONCLUSIONS

These analyses and models provide lenders, farmers, and others who might be interested in land markets with estimates of land values and the relative impacts of factors affecting these markets. While the models are of reasonable quality, the lack of large explanatory components indicates that factors not identified and analyzed are important. Land markets are diverse, dynamic, and complex. Thus, efforts should be devoted to broadening data bases and making analyses at the most disaggregated levels possible. This process can be expensive in terms of both resources and time.

A bottoming-out and upturn in values were identified in several models. These conditions are believed to have extended to other areas since the end of the data base used for the analysis (1987). This tendency is somewhat confirmed by USDA estimates which indicate stable values for the State between 1987 an 1988 and a 4 percent increase in values between 1988 and 1989 (17). Though less pronounced, similar estimates of changes in value have been identified for Louisiana and Mississippi.

Explanatory power of the estimated models indicates rural land markets are influenced by myriad factors, both farm and nonfarm oriented. The importance of nonfarm influences and security classification variables in the models attests to this relevance. Also, several variables may have small individual impacts and, yet, collectively these variables may explain substantial variation in land values.

SELECTED REFERENCES

(1) ALSTON, JULIAN M. 1986. An Analysis of Growth of U.S. Farmland Prices, 1963-82. Amer. J. Agr. Econ. 68:1-9.

(2) BARNARD, CHARLES H. AND JOHN HONES. 1987. Farm Real Estate Values in the United States by Counties, 1850-1982. USDA, ERS, Statistical Bulletin Number 751; U.S. Government Printing Office (March 1987).

(3) BARRY, PETER J., JOHN A. HOPKIN, AND C. B. BAKER. 1983. Financial Management in Agriculture, 3rd ed. Interstate Printers and Publishers, Danville, Ill.

(4) BLASE, MELVIN G. AND CLYDE HESEMANN. 1973. Farm Land Prices: Explainable or Illogical? So. J. Agr. Econ. 51:265-70.

(5) BURT, O.R. 1986. Econometric Modeling of the Capitalization Formula for Farmland Prices. Amer J. Agr. Econ. 68:10-26.

(6) CLIFTON, IVERY D. AND STAN R. SPURLOCK. 1983. Analysis of Variations in Farm Real Estate Prices Over Homogenous Market Areas in the Southeast. So. J. Agr. Econ. 15,1:89-96.

(7) DOLL, JOHN P. AND RICHARD WIDDOWS. 1981. Capital Gains Versus Current Income in the Farming Sector: Comment. Amer. J. Agr. Econ. 63:730-3.

(8) HERDT, ROBERT W. AND WILLARD W. COCHRANE. 1966. Farm Land Prices and Farm Technological Advance. Amer. J. Agr. Econ. 48:243-63.

(9) HERR, WILLIAM McD. 1975. The Influence of Farm Mortgage Loan Terms on Farm Real Estate Values. So. J. Agr. Econ. 7,1:153-158.

(10) KIZER, LENNIE G. AND STANLEY R. SPURLOCK. 1982. Mississippi Land in Farms, Farm Numbers and Farm Real Estate Values, 1850-1980. Mississippi State University, Miss. Agr. and For. Exp. Sta., Ag. Econ. Res. Rpt. 135.

(11) LAIRD, DAVID T. AND J. L. ADRIAN. 1979, An Analysis of the Rural Land Market in the Limestone Soil Region of Alabama. Ala. Agr. Exp. Sta. Bull. 512.

(12) MISRA, SUKANT. 1986. Analysis of Farm Real Estate Values in the United States, 1955-1985. Unpublished M.S. Thesis. Dept. of Ag. Econ., Miss. State University.

(13) NELSON, W.E. AND J.L. ADRIAN. 1976. Variations in Rural Land Values in the Black Belt Region of Alabama. Ala. Agr. Exp. Sta. Bull. 483.

(14) PLAXICO, JAMES S. AND DARREL D. KLETKE. 1979. The Value of Unrealized Farm Land Capital Gains. Amer. J. Agr. Econ. 61:327-30.

(15) SCOFIELD, WILLIAM H. 1957. The Land Market and Economic Development. J. Farm Econ. 39:1,500-10.

(16) SPURLOCK, S.R. AND J. L. ADRIAN. 1978. Variations in Rural Land Values in the Wiregrass Region of Alabama. Ala. Agr. Exp. Sta. Bull. 504.

(17) USDA, ERS Agricultural Resources. 1989. Outlook and Situation Summary. Washington, D.C. (April, 1989).

(18) USDA, ERS. 1986. Economic Indicators of the Farm Sector: National Financial Summary, 1985; ECIFS 5-2; U.S. Govt. Print. Off.; Washington, D.C. (November 1986).

(19) TWEETEN, LUTHER G. AND JAMES E. MARTIN. 1966. A Methodology for Predicting U.S. Farm Real Estate Price Variation. Amer. J. Agr. Econ. 48:378-94.

(20) VANDEVEER, LONNIE R. 1986. Issues in Agricultural Land Markets: An Empirical Perspective. S. J. Agr. Econ., 17:75-84.

(21) VOLLINK, WILLIAM J. 1978. Analysis of Factors Related to Per Acre Prices of Bare Land: North Carolina 1975-1976. So. J. Agr. Econ. 10, 2:143-50.

(22) ZEIMER, ROD F. AND FRED C. WHITE. 1981. A Tobit Model of the Demand for Farmland. So. J. Agr. Econ. 13,2:105-109.

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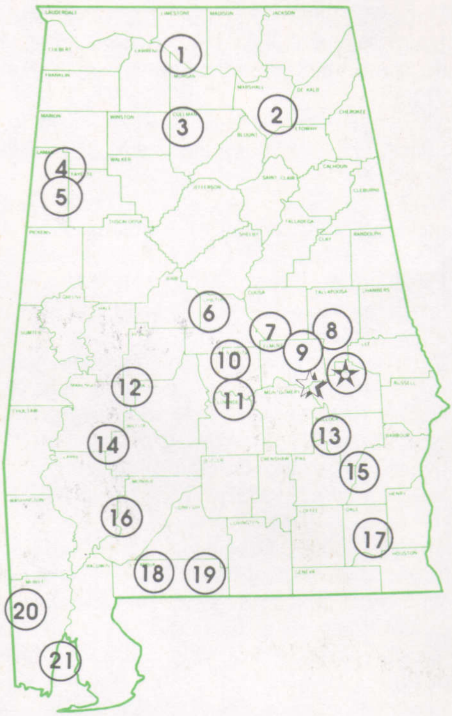

Research Unit Identification

☆ Main Agricultural Experiment Station, Auburn.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Chilton Area Horticulture Substation, Clanton.
7. Forestry Unit, Coosa County.
8. Piedmont Substation, Camp Hill.
9. Plant Breeding Unit, Tallassee.
10. Forestry Unit, Autauga County.
11. Prattville Experiment Field, Prattville.
12. Black Belt Substation, Marion Junction.
13. The Turnipseed-Ikenberry Place, Union Springs.
14. Lower Coastal Plain Substation, Camden.
15. Forestry Unit, Barbour County.
16. Monroeville Experiment Field, Monroeville.
17. Wiregrass Substation, Headland.
18. Brewton Experiment Field, Brewton.
19. Solon Dixon Forestry Education Center, Covington and Escambia counties.
20. Ornamental Horticulture Substation, Spring Hill.
21. Gulf Coast Substation, Fairhope.