Interregional Competitive Impact of Urban Influenced Farmland Prices

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The paper's hypothesis is that the farmers using land with urban influenced prices are at a competitive disadvantage because their land input cost exceeds it calitialized earning power while land prices for other farmers are based on earning ability. This hypothesis was investigated by comparing rates of return to land in Massachusetts and two non-urban dairy regions in Wisconsin. Both areas have low rates of return compared to contemporary market interest rates with Massachusetts rates somewhat below those in Wisconsin. When additional factors are considered, the hypothesis is weakly supported, at best.

The literature on interregional competition in agriculture has compared regional differences for a great variety of production and transportation cost factors. For the land input, which is judged by the USDA to be 24 percent of all inputs (Cobb), the price of land and real estate taxes have often been compared to measure regional competitive advantage (Babb; Bauer and Wells; Greig; Zepp).

Nowhere in the literature have regional differences in the earning capacity of the land used for agriculture in relation to its market price been examined. The objective of this paper is to examine this source of competitive difference with particular reference to land with and without urban influenced prices.

The hypothesis on which the paper is based suggests that market prices of farmland within the range of urban influence will be created by the interaction of non-agricultural market forces (Phipps). Farmers may buy and sell land at these prices but the earning capacity of farmland will have little influence on price since other market forces will push price well above the level farmers would pay in the absence of these other forces. The increment in addition to agricultural value is an extra cost of farming in an urban influenced area compared to areas where the value of land for agriculture dominates the land market. In the latter case, the earning capacity of the land will support the price paid for the land while in the former case, it will not. Farmers with urban influenced land must supplement the income from the land (land rent) with income from other sources to pay for their land input. This extra cost of the land input is hypothesized to create a competitive disadvantage compared to farmers producing the same products on land where earning capacity in agriculture controls land prices.

There is no implication about comparative levels of market land prices in this hypothesis. A properous agricultural area far from a city may have higher land values per acre than a farming area near a city. Yet the area far from a city could have the competitive advantage since its land prices are hypothesized to be closely related to earning capacity while near urban areas, land prices may be higher than earning capacity can support.

Regional differences in farm size, resource endowment, location, product mix, operating costs, and similar factors are not relevant to this analysis. Their impact has been incorporated, by market action, into the basic data of land rent which will be used for comparison between the two farming situations.

Many urban states hope to maintain agricultural land in its current use because of the non-market social values perceived by voters to be associated with it. Preservation can be accomplished only by modifying the action of market forces which are moving farmland into urban uses. If the hypothesis is supported, this study will increase knowledge of market forces which must be modified to achieve the objective and, in particular, will support the purchase of development rights programs in

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several urban states. Once the rights are purchased, any competitive disadvantage of land prices out of line with earning capacity would be eliminated for the urban influenced farmer. The purchase program not only protects the land from use conversion but can also improve the competitive position and economic viability of the farmer.

Methodology

The study is based on a comparison between a region with strong urban influences in the farmland market and one where the land market is clearly dominated by farmers selling to farmers. The state of Massachusetts has been selected to represent the urban influenced area while two regions in Wisconsin, Central and Southwest, represent regions with little urban influence. In terms of crop acreage, both regions are dominated by dairy farming, the major reason for selecting them for comparison.

The contrast of urban influence in the two areas to be compared is indicated by use conversion pressure in the two land markets. According to the Wisconsin Agricultural Reporting Service (WARS), in the two Wisconsin regions in 1982, 39,574 acres of agricultural land were sold for continued agricultural use (WARS). Only 2,855 acres were sold to be diverted to other uses, .06 percent of the total agricultural land base of about 4.7 million acres. In Massachusetts, estimates of crop and pasture land diversion to urban related uses vary from 6,000 to 10,000 acres per year, 2 to 3 percent of the 300,000 acres in these uses in the state in 1982 (Bailey, Rosenberger and Kolman; Gray; Foster and MacConnell). Massachusetts data on land sold by farmers to continue in farming are not collected.

Differences between Massachusetts and Wisconsin in land market action over time also support the assumption of greater urban influence in Massachusetts. Year to year changes in the value of farmland in Wisconsin show rapid increases from 1976 to 1981, a period of general optimism in midwestern agriculture and declines since then with the loss of this optimism (Table 1). In Massachusetts, the change has been consistently upward and remarkably constant, except for two years of uncommon national economic conditions (1978 to 1979 and 1982 to 1983). Although agriculture in Massachusetts is more diversified and has other more stabilizing characteristics than in Wisconsin, these data support the conclusion that urban influences have more impact on the agricultural land market in Massachusetts than in Wisconsin.

Table 1. Year to Year Change in Average Value per Acre of Farmland. Massachusetts and Wisconsin 1974-1984

	Massachusetts	Wisconsin
1974 to '75	$+ 86	$+ 45
1975 to '76	+ 83	+ 62
1976 to '77	+ 94	+ 102
1977 to '78	+ 123	+ 120
1978 to '79	+ 182	+ 138
1979 to '80	+ 109	+ 124
1980 to '81	+ 89	+ 125
1981 to '82	+ 66	- 32
1982 to '83	+ 34	- 54
1983 to '84	+ 113	- 61

Source: USDA, ERS, Farm Real Estate Market Developments, CD-88 and CD-89. Washington, D.C., August 1983 and 1984.

This research is facilitated by information developed by the Massachusetts program to purchase development rights on farmland. Because the value of rights is based on the difference between the capitalized value of land for agriculture and its market price, a careful determination of returns to land (land rent) from agriculture is required for each farm in the program. This information has not been available in a standardized form. Rental data, which have been available, are less satisfactory because of the widespread practice, in Massachusetts, of setting cash rent equal only to expected taxes on the land to eliminate out-of-pocket holding costs of the landowner. The extent of this practice is implied by Table 2 which is based on USDA statistics. The average land owner renting land to farmers in Massachusetts receives less than one percent return on his/her investment after taxes are subtracted from cash rent.

The reader might expect that Vermont, a mostly rural, dairy state close to Massachusetts would be more satisfactory for comparison than Wisconsin. Vermont has not been used because tax based rents are also common there and there is no alternative source of land rent data (Trembley). In addition, Vermont land values are influenced by the second home market and other demand pressures from urban areas to its south.

The comparison to be made between the two areas is based on the land rent per acre

Table 2. State Average Cash Rents for Cropland, 1982, and Ratio of Rent minus Taxes to Value, 1979-1982; Massachusetts and Wisconsin

	Massachusetts	Wisconsin
Cash rent per acre, 1982	$ 32	$ 58
Rent minus Real Estate Taxes per acre, 1982	11	44
Average value per acre, 1982	1707	1073
Ratio of rent minus taxes to value, 1982 (percent)	0.6	4.1
Ratio for 1981 (percent)	0.9	3.8
Ratio for 1980 (percent)	0.6	4.0
Ratio for 1979 (percent)	0.7	4.3

Source of data: USDA, ERS, Farm Real Estate Market Developments, CD-88 and CD-89. Washington, D.C., August 1983 and 1984.

earned by agriculture and the market value of the farmland. The hypothesis will be supported if the rate of return on market value, as determined by land rent, is substantially lower in Massachusetts than in Wisconsin although other factors, as discussed below, must be recognized.

Comparison of Rates of Return in the Two States

If prices in the non-urban agricultural land market market were based only on the standard capitalization equation (V = a/r), using net annual cash rent minus taxes for annual net income, this comparison would be uncomplicated. However, farmers seem to be an optimistic crowd with some indication that the most optimistic have undue influence on land prices (Brown and Brown). Scott reports that during the relatively stable period of the 1960's in Illinois, it took the net cash rent from two acres to pay the interest on funds borrowed to purchase one acre. This ratio declined in the 1970's as land values lagged behind rents and land income but in the early 1980's was in the neighborhood of 3 or 4 acres to one as both land values and interest rates have climbed relative to cash rents.

Castle and Hoch also found only about half of farm real estate values were explained by capitalized rent over the 1920-78 period. They attribute the other half to capitalization of anticipated increases in land values. Another inclusion in the annual income of non-urban agricultural land seems to involve the higher marginal income per added acre associated with economics of scale (Scott). Farmers buying land to expand the size of an operating farm can pay more per acre than another person buying the land as an entire farm and are a major force in the market (Downs, Smith, and Raup). Other parts of annual income are the perceived income tax advantages of owning farmland compared to alternative investments and the possible impact of foreign investors whose domestic investment opportunities yield low returns. In an ultimate sense, annual income is impacted by the number of people who want to be farmers and how much sacrifice they are willing to accept in their returns to labor and management in order to buy the land needed to be a farmer.

Because of these factors in the land market, farmland values in regions without urban influence tend to be higher than can be supported by market established annual cash rent recieved from the land. The objective of this paper, then, can be met by comparing the extent to which land values in the two selected states deviate from the value determined by capitalization of net rent. A current return deficit (Scott) exists in both states. If the deficit is similar in both states, the hypothesis that urban influenced farmland has a competitive disadvantage will be rejected.

With the above perceptions in mind, the desired comparison between the two areas can be made. The study is based on available secondary data and must be viewed as exploratory.

Weighted data from the two dairy regions in Wisconsin are shown in Table 3. State average agricultural real estate taxes per acre and other landlord costs, such as insurance and repairs, estimated to be about 1.0 percent of cash rent (Leuning), are subtracted from reported average cash rent per acre for all farmland to obtain an estimate of market established net rent.

The Massachusetts data are statewide and include all types of farms (Table 4). However, dairy farming uses over 80% of all crop and pasture land in the state. Data on the Agricultural Preservation Restriction (APR) Program line are averages per acre from 73 farms on which APR purchases had been completed in 1982 and 1983. Both price and economic rent averages for APR farms are based on appraisal data from the program. The rate of return to land is calculated from the preceding two averages.

Table 3. Current Agricultural Land Prices, Net Rents, and Rates of Return in Two Non-

Year	Average price of land and buildings per acre[1]*	Net rent per acre[c]	Rate of return on investment in real estate (percent)
1975	$ 467	$28	6.0
1976	561	36	6.4
1977	693	42	6.1
1978	832	48	5.9
1979	968	49	5.1
1980	1077	54	5.0
1981	1128	57	5.0
1982	1111	57	5.1
State Average 1982	1182	48	4.1

[a]Counties included: Central Region—Adams, Green Lake, Juneau, Marquette, Portage, Waupaca, Waushara, and Wood. Southwest Region—Crawford, Grant, Iowa, Lafayette, Richland, Sauk, and Vernon.
[b] Weighted by number of acres in each region.
[c] Weighted average cash rent minus state average agricultural real estate taxes per acre and one percent of cash rent for other landlord expenses.
Source: Agricultural Land Sales and Rental Rates. Annual Reports, Wisconsin Agricultural Reporting Service, Madison. Tax data is from Farm Real Estate Market Developments, CD-88 and 89, ERS, USDA, 1983 and 1984.

Since the APR program concentrates on farms which are threatened by use change and are deemed to have substantial long-run economic viability, program land rent and land value figures are probably higher than state averages. The Federal Land Bank data in Table 4 are based on actual sales as reported by the two FLB offices in the state and are probably more representative of average conditions. Land rent reported for the FLB farms has been estimated, using a 3.5 percent rate of return, the general rate established by the market, according to FLB officials (Clapp).

The estimates of rates of return to investment in agricultural real estate in both states show substantial current returns deficits. In Massachusetts, the 1982 rate of return was in the range of 2.7 to 3.5 percent while in Wisconsin, it was 5.2 percent. These rates compare with the 1982 FLB mortgage interest rate of 13.5 percent. Even if the 1982 FLB rate is assumed to be abnormal and discussion is based on a lower rate of 9 or 10 percent, income from two acres is needed to pay the mortgage interest on one acre in Wisconsin and from more than two in Massachusetts.

The objective of this paper, however, is to compare the rates of return in the two states. The comparison does show that land values in Massachusetts are somewhat more out of line with the land's earning capacity, when it is used for agriculture, than in Wisconsin. The difference of about 1.5 to 2.0 percentage points is a basis for estimating competitive disadvantage of Massachusetts farmers compared to Wisconsin farmers resulting from the differential relationship between market land prices and economic rent. Land costs in Massachusetts would need to be reduced by about one third or economic rent would need to be

Table 4. Agricultural Land Prices, Land Rent and Rate of Return in Massachusetts, 1982-83

	Number of farms	Average market price of land per acre	Average estimated agricultural land rent per acre	Average rate of return to land
Farms in Agricultural Preservation Restriction Program				(percent)
Federal Land Bank, South Deerfield				
Federal Land Bank, Taunton	73	$2445	$65	2.7
ERS— USDA State	21	1349	47	3.5
Estimate (1982)	20	1714	60	3.5
		1707	11[a]	0.6

[a]Average Cash rent minus average taxes. The low figure is evidence of the widespread practice of setting rent equal to taxes to cover the out-of-pocket cost of holding land.
Sources: Purchase of Development Rights Program—Appraisal and other data supplied by William King, Consultant to Massachusetts Department of Food and Agriculture.
Federal Land Bank—Conversation with and data supplied by Arthur Clapp, Assistant Vice President and Chief Reviewing Appraiser,

raised by 50 percent to make the two groups of farmers competitively equal for this factor. Net income from land in Massachusetts in 1982 was $20 to $25 per acre lower than was needed to sustain the same rate of return to capital invested in land as was being achieved by Wisconsin farmers.

This market established difference between the two states supports the hypothesis of this paper although the difference is smaller than expected by this author. To the extent that land in Massachusetts is overvalued, relative to Wisconsin, Massachusetts farmers must pay the difference in land owning costs from non-land income, perhaps by accepting a lower return to labor and management.

This conclusion, however, is not as clear as is implied above. At least two other market influences may be involved in helping to create the difference. Typical market actors in Massachusetts may expect a more rapid and more risk-free appreciation in land values than in Wisconsin due to anticipated urban expansion. These expectations will become built into the market price of farmland and will represent an expected market response to conditions. The currently elevated land price makes it difficult for the farmer to make land mortgage payments from current income but the market may be saying that, in the long run, land value appreciation will compensate the farmer for his early difficulties.

The second market influence is mentioned above. Since many Massachusetts farmers rent a substantial portion of their land and pay rents which typically are set at the level of taxes on the rented land or slightly above, the land rent earned by this rented land goes largely to the farmer rather than to the land owner. The farmer then has this income to use for other purposes, perhaps to finance a higher price for the land he does own. To the extent that tax related rents are sufficiently widespread to influence the market for farmland in Massachusetts, this practice could help explain the difference in rates of return between the two states.

Conclusions

When the possible influence of these factors is combined with the difference in rate of return in the two states, the hypothesis on which this paper is based is weakly supported, at best. This hypothesized source of competitive disadvantage for Massachusetts farmers, as a whole, seems to be unimportant to their economic viability.

Massachusetts farmland is, however, moving into urban uses in response to market forces. Farmers who are geographically close to the urban conversion action do use land with prices that are more out-of-line with its earning capacity than the state average. This is indicated by a comparison between Land Bank and APR data in Table 4. While the capitalization of anticipated price increases from urban growth may play a more important part in price decisions on these farms than on other farms in the state, the conclusion that these farms are at a greater competitive disadvantage than others in the state and in Wisconsin seems reasonable.

Purchase of development rights programs are an institutional tool which will eliminate this competive disadvantage for the urban threatened farms and increase their current and future economic viability. The purchase will remove both the current competitive disadvantage and the potential capitalization of future anticipated price increases based on urban development potential. They will, therefore, contribute to the social objective of preserving urban threatened farmland in Massachusetts and other states with these programs.

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