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Agriculture and
Rural Economy
Division

Farm Structural Changes in Metropolitan and Nonmetropolitan Counties, 1978-87

Fred K. Hines
Douglas A. Rhoades

The long-term national trend of decline in farm numbers and increase in average farm size continued in 1978-87, with farm numbers declining by 7.6 percent and average farm size increasing by 12.2 percent. While trends in nonmetropolitan areas mirrored national trends of fewer and larger farms, in contrast to trends in urban counties where the number of farms declined by 4.1 percent and the average farm size declined by 4.1 percent. Although regional differences in farm structure complicate inter-regional comparisons, the greater availability of off-farm employment in metro areas and in areas with some metro proximity helps explain the smaller decline in metro farm numbers. Differences in farm structural changes among regions resulted from regional differences in the comparative advantages in the production of various farm commodities as well as the degree of regional urbanization and availability of nonfarm jobs. Changes in farm numbers and average farm size ranged from a growth in the number of farms (9.5 percent) and a reduction in farm size (12.2 percent) in the West to a decrease in farm numbers (12.6 percent) with an increase in size (9.2 percent) in the Midwest. Two location ratios to growing, dominant metro areas will become even more important in the future to assess farm viability and farm structure.

Keywords: Farm structure, metro-nonmetro, regions

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Farm Structural Changes in Metropolitan and Nonmetropolitan Counties, 1978-87.
By Fred K. Hines and Douglas A. Rhoades. Agriculture and Rural Economy Division,
Economic Research Service, U.S. Department of Agriculture. Staff report number
AGES 9408.

Abstract

The long-term national trend of decline in farm numbers and increase in average farm size continued in 1978-87, with farm numbers declining by 7.6 percent and average farm size increasing by 2.9 percent. While trends in nonmetro areas followed national trends of fewer and larger farms, they were in contrast to trends in metro counties where the number of farms fell by only 4.2 percent and the average farm size declined by 4.1 percent. Although regional differences in farm structure complicate metro-nonmetro comparisons, the greater availability of off-farm employment in metro areas and in areas with some metro dominance helps explain the smaller decline in metro farm numbers. Differences in farm structural changes among regions resulted from regional differences in the competitive advantages in the production of various farm commodities as well as the degree of regional urbanization and availability of nonfarm jobs. Changes in farm numbers and average farm size ranged from a growth in the number of farms (9.5 percent) and a reduction in farm size (12.2 percent) in the West to a decrease in farm numbers (12.8 percent) with an increase in size (9.2 percent) in the Midwest. Farm location relative to growing, dominant metro areas will become even more important in the future to overall farm viability and farm structure.

Keywords: Farm structure, metro-nonmetro, regions.

Acknowledgments

The authors acknowledge the help of Tiffany Mills in formatting and typing this report. This report was reproduced for limited distribution to the research community outside the U.S. Department of Agriculture and does not reflect an official position of the Department.

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Farm Structural Changes in Metropolitan and Nonmetropolitan Counties, 1978-87

Fred K. Hines
Douglas A. Rhoades

Introduction

Technological innovation and pressure to achieve economies of scale have been two major forces behind national trends in farm structure. The result has been fewer, larger, and more capital-intensive farms. Currently, the number of U.S. farms is less than a third of its peak in the 1930's, and average farm size is three times as large. However, these aggregate trends mask differing trends across metropolitan and nonmetropolitan and regional settings. [In this report, we illustrate the differences in farm structure and recent trends in farm structure across metropolitan and nonmetropolitan counties by region. This illustration provides insights into the broad complexity of factors impacting farm structure and how this complex differs in various socio-economic settings across the Nation. We first illustrate how differences in local and regional growth and development result in both negative and positive impacts on viability of farming and its overall structure in metropolitan and nonmetropolitan counties. We also look at regional differences in farm structure and how regional competitive advantage in the production of various farm products alters various indicators of farm structure such as farm size and sales intensity from one region to another.]

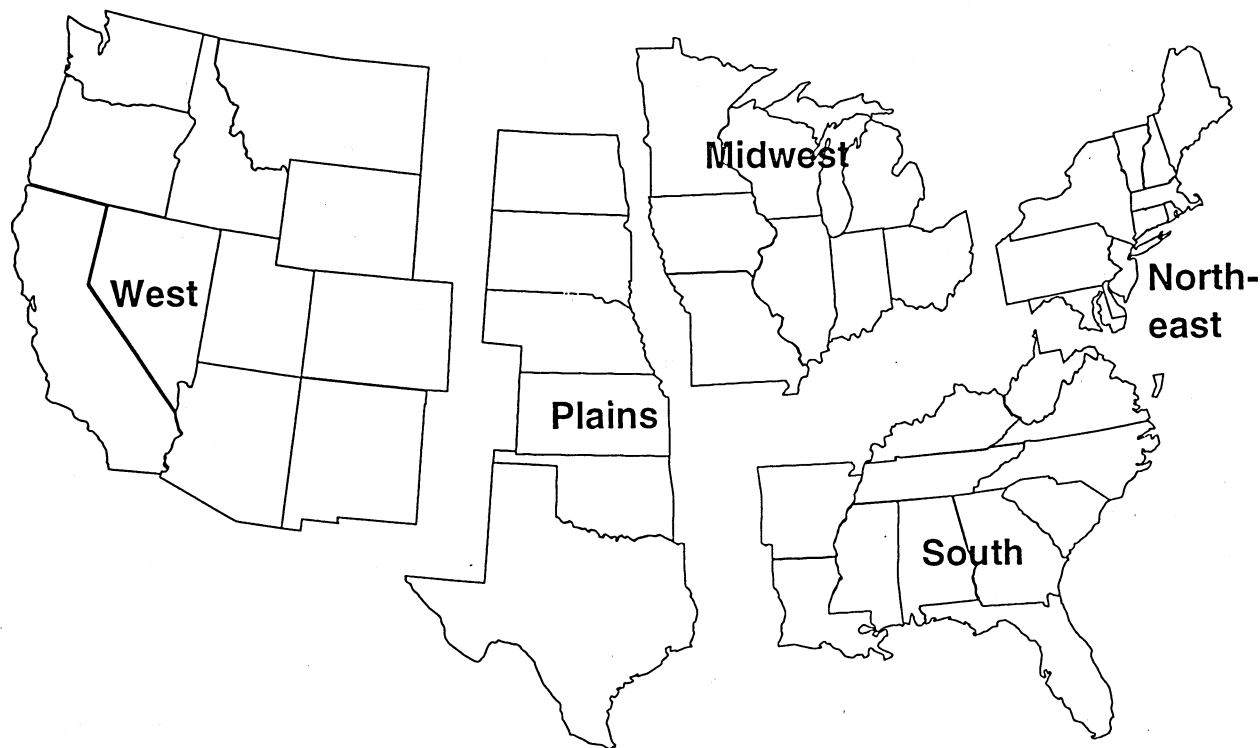
The diversity of changes in farm structure is documented for the 1978-87 period using county-level data from the Census of Agriculture, 1978 and 1987. A county is defined as metropolitan if it is included in an area designated by the Office of Management and Budget as a Metropolitan Statistical Area (MSA) consisting of a large population nucleus together with adjacent communities that have a high degree of economic and social integration. For MSA designation, the population nucleus must have at least 50,000 people and/or the entire area must exceed 100,000 people. U.S. metropolitan counties are divided into those that are a part of larger metropolitan areas (1 million population or more) and counties of other metropolitan areas of less than 1 million people. Counties outside metro areas, nonmetro counties, are divided into those that are adjacent to a metro area and those that are not. We employ five regions, which represent aggregation of the farm production regions used extensively by the Economic Research Service (fig. 1). Regions are further divided into metro and nonmetro counties.

Farm Numbers and Farm Size

National Trends

In the mid-1930's, the number of U.S. farms peaked at 6.8 million. By 1987, this number had fallen to 2.1 million. At the same time, average farm size had increased from 154 acres to 461 acres. Farm numbers continued their long-term downward trend during the 1978-87 period, declining by 171,000 farms, or 7.6 percent. This decline represented less than 1 percent annually, despite the recession during the early 1980's, which strained the financial resources of many farmers. Average farm size during the 1978-87 period increased by 2.9 percent to 461 acres. The decline in U.S. farm numbers can be explained by the continuation of commercial farm consolidation and increased average farm size due to the greater productivity of farm resources associated with mechanization, improved management, and increased technological innovations. These developments allow commercial farmers to operate larger operations with less labor. The increased productivity of labor and other inputs such as improved fertilizer, pesticides, and plant varieties has led to increased food production. Unfortunately for U.S. farmers, this increased supply has put downward pressure on farm prices and has hurt

Figure 1. Aggregate farm production regions



the general viability of their farms. For a more thorough discussion of factors associated with changes in farm structure at the national level, see Reimund and Gale.¹

Metropolitan influence on farm structure has presented farming with both opportunities and problems. Increased opportunities from urbanization of local and regional economies include increased competition for farm resources in nonfarm alternatives. Some benefits are increased nonfarm job opportunities for farm household members, farmland appreciation spurred by speculation of conversion of farmland to nonfarm uses and improved proximity to consumer markets for high-valued products such as fruits and vegetables.

Drawbacks for agriculture that accompany urbanization include: conflicts with nonfarm households and individuals over farm odors and transportation of farm equipment on urban roadways; an increased incidence of vandalism to farm property and crops; and reduced access to suppliers of farm inputs (such as fertilizer, seed, and feed) and traditional markets such as grain elevators and hay and livestock auctions.

In addition to the above effects, local growth and urbanization provide surrounding farms with a new and more complicated business environment. Urbanization bids up farmland prices, increasing farm equity and the farmer's ability to raise additional capital while at the same time increasing property taxes. These changes in asset valuation and tax liabilities put pressure on the farm sector to sell off land for development and to change the mix of farm enterprises in favor of enterprises that offer higher returns more comparable to those in nonfarm

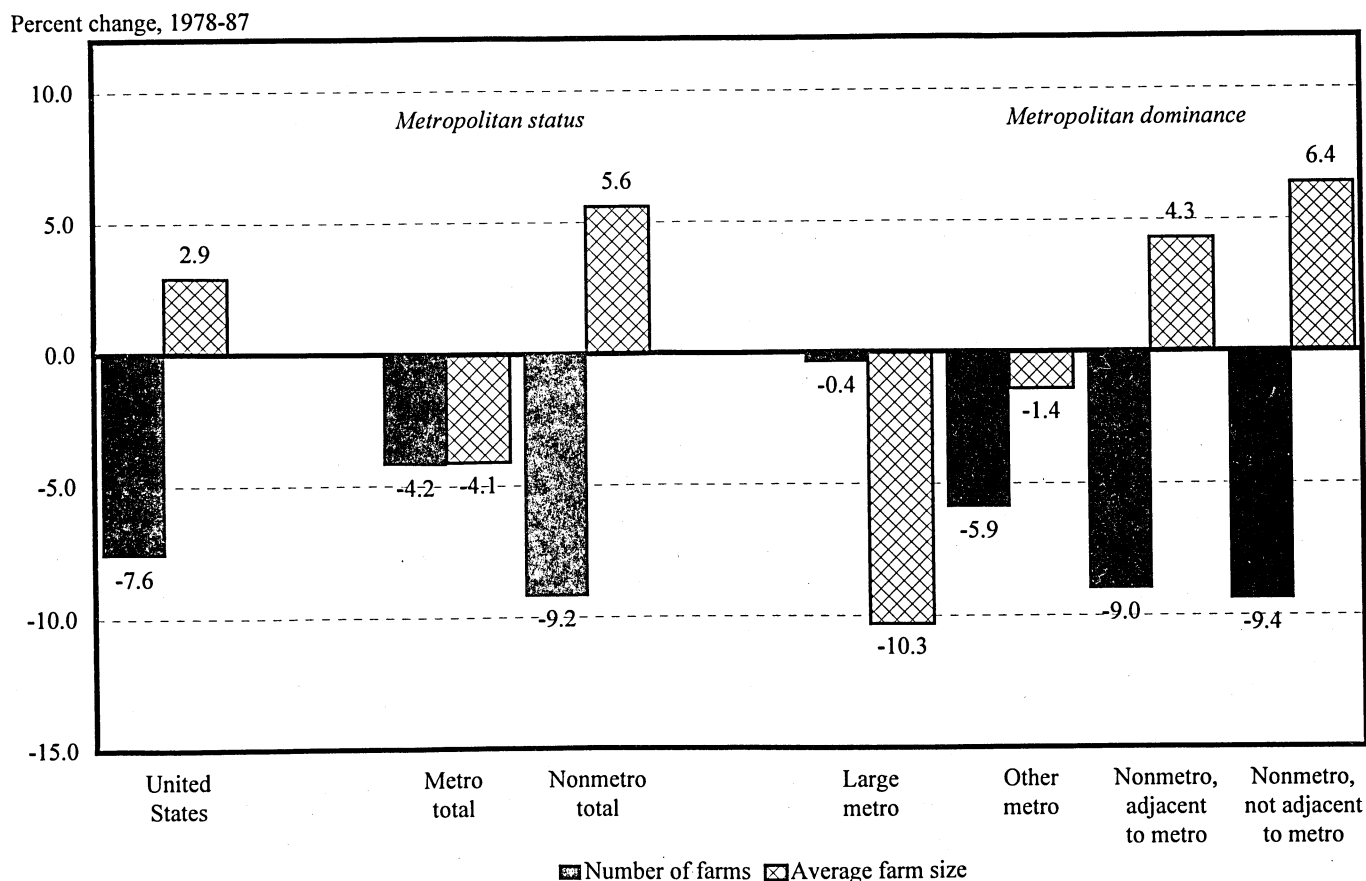
¹Reimund, Donn, and Fred Gale. *Structural Change in the U.S. Farm Sector, 1974-87*, United States Department of Agriculture, Economic Research Service, AIB-647. May 1992

enterprises. For more discussion of the impacts of metropolitan growth on farm structure, see Heimlich and Brooks.²

Farm numbers, total farmland, and average farm size all declined in metro areas during the 1978-87 period, in contrast to trends in nonmetro areas of declining farm numbers, increasing farm size, and a relatively constant farmland base. For the Nation, only 4.9 percent of the total farmland was lost during the period suggesting that urbanization is not a serious threat to the Nation's farming production capacity.

Farm numbers in U.S. metro areas declined by 4.2 percent during 1978-87, much less than that for the Nation as a whole (7.6 percent). In contrast to increased farm size at the national level, average farm size declined by 4.1 percent in metro counties (fig. 2). Changes in farm structure between metro and nonmetro areas represent extremes from the national norm. Overall farm numbers in large metro areas declined by less than 1 percent (0.4 percent) while average farm size declined by 10.3 percent. Land in farms declined by 10.6 percent in large metro areas suggesting development pressures for farmland (see app. table 1). On the other hand, farm numbers in nonmetro areas declined by 9.2 percent, and average farm size increased by 5.6 percent. Changes in farm numbers and sizes were not greatly affected by adjacency to a metro area. Nonmetro counties removed from metropolitan influence (not adjacent) lost 9.4 percent of their farms and 3.6 percent of their farmland, with the average farm size increasing by 6.4 percent to 738 acres.

Figure 2
Change in farm number and size by metropolitan status, 1978-87



²Heimlich, Ralph E., and Douglas H. Brooks. *Metropolitan Growth and Agriculture: Farming in the City's Shadow*, United States Department of Agriculture, Economic Research Service, AER-619. September 1989.

Regions and Farm Structure

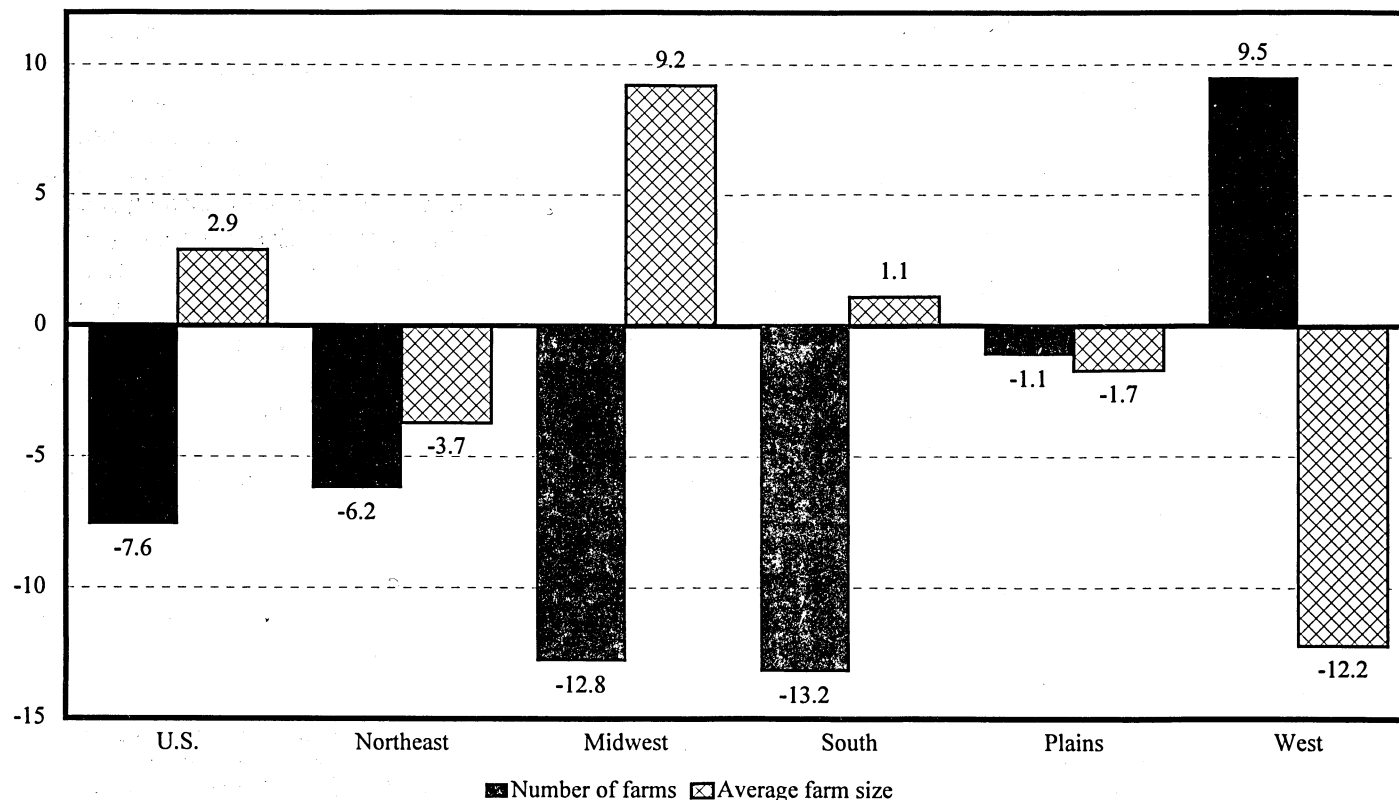
Farms have become more specialized along commodity lines, and this has led to regional specialization. Thus, farm structural changes across regions are affected by the regionality of production of principal commodities, economies of scale, and national and global forces affecting the production of principal commodities. Changes across regions are also affected by the degree of urbanization. Changes in farm structure in the Midwest and South, where traditional farming such as cash grain and other crop farms are the norm, follow closely the general perception of U.S. structural change of a continued move to fewer, bigger farms. The economics of field crop farming, in particular, reward larger farms that can take advantage of new technology, larger and more specialized machines, and the cultural practices of minimum and no-till land management. On the other hand, regions specializing in higher value commodities -- such as parts of the West and Northwest specializing in fruits and vegetables and nursery products -- have experienced farm structural changes that favor more intensity of production per unit of land but not necessarily larger farms.

Trends in farm numbers varied greatly across regions ranging from an increase of 9.5 percent in the West to decreases of 13.2 and 12.8 percent in the South and Midwest (fig. 3). Among metro and nonmetro counties by region, changes in farm number ranged from an increase of 12.1 percent in metropolitan areas of the West to a decline of 14.8 percent in the nonmetro South. Changes in average farm size ranged from a decline of 17.3 percent in the metro West to an increase of 10.1 percent in the nonmetro Midwest (see app. table 1). Percentage losses of farmland were highest in the South (12.3 percent) and Northeast (9.6 percent) and lowest in the Plains (2.7 percent).

Figure 3

Change in farm number and acres per farm by region, 1978-87

Percent change, 1978-87



Changes in Farm Numbers by Sales Class

Metro-nonmetro and regional differences in changes in farm numbers are a function of differences in the sales class distribution of farms and the viability of farms by sales class. Here, we group farms in 1978 and 1987 into four sales categories: Rural residences (sales of less than \$10,000), small family farms (\$10,000 - \$99,999 in sales), large family farms (\$100,000 - \$249,999 in sales), and large commercial farms (sales of \$250,000 or more). Sales in 1978 were inflated to 1987 prices by the index of prices received by farmers to adjust for growth in sales due to farm price increases.³

Rural Residences

Rural residences (sales of less than \$10,000) comprised almost half (49.2 percent) of all U.S. farms in 1987 (fig. 4). During the 1978-87 period, the number of such farms grew by 1.2 percent nationwide and 5.8 percent in metro counties (fig. 5). The viability of rural residences depends on the availability of nonfarm employment much more than on the returns from the farm. A lack of such nonfarm employment is one of the reasons nonmetro counties experienced a 1.4-percent decline in rural residences. Changes in the number of farms classed as rural residences ranged from substantial increases within large metropolitan areas (12.3 percent) to declines of 2.1 percent in nonmetro counties not adjacent to metro areas.

Regionally, rural residences comprised the largest share of all farms in the South (accounting for 63.9 percent of all farms), and they were least important in the Midwest (38.0 percent). In the metro South, farm rural residences accounted for two of every three farms (67.0 percent) whereas in the nonmetro Midwest they accounted for one of every three farms (35.2 percent). Changes in the number of farm rural residences ranged from a loss of 7.1 percent in the South to a gain of 23.7 percent in the West (see app. table 2).

Small Family Farms

Small family farms (sales of \$10,000 - \$99,999) constituted 36.6 percent of all U.S. farms in 1987. During 1978-87 their numbers declined by one-fifth (20.6 percent). This decline was pronounced across metro as well as nonmetro counties and across all regions, with the decline being largest in the South and Northeast and smallest in the West. This large decline of small family farms, while the numbers of other farm sizes increased, illustrates the dampening effect of small farm size on farm viability. While nonfarm jobs and income support the viability on an increased number of farm rural residences, conflicts arise for small family farms between the time spent in nonfarm pursuits and the demands of farm activities; households on farms of this size are caught in a farm-nonfarm support dilemma. Do they increase nonfarm income at the expense of farm income or do they forgo some nonfarm opportunities to increase farm sales? Either decision could lead to existing farms moving out of this class. For those who choose to follow more nonfarm opportunities, farm sales fall, possibly below the \$10,000 threshold. On the other hand, farmers who choose to increase farm sales may succeed in moving to a larger sales group. The move toward more nonfarm support, to the point of falling farm sales or abandoning farming altogether, is the more likely outcome. While members of such households are likely to be competitive on the nonfarm labor market, the competitive position of their farm operation is not strong, given their small size relative to larger, more commercial farms.

³The index of prices received by farmers rose 10.4 percent between 1978 and 1987. The 1978 sales categories were therefore adjusted to depict "real" changes in the volume of goods produced, not changes in price levels. We assumed that farm numbers were evenly distributed within each sales category. For example, the sales category of "less than \$10,000" was adjusted to "less than \$9,055" (since in 1978, \$9,055 would purchase the same volume of products that cost \$9,999 in 1987). The 1978 farms falling within the \$9,055 to \$9,999 range were moved up to the next category.

Figure 4

Distribution of farms by sales class of farm, 1987

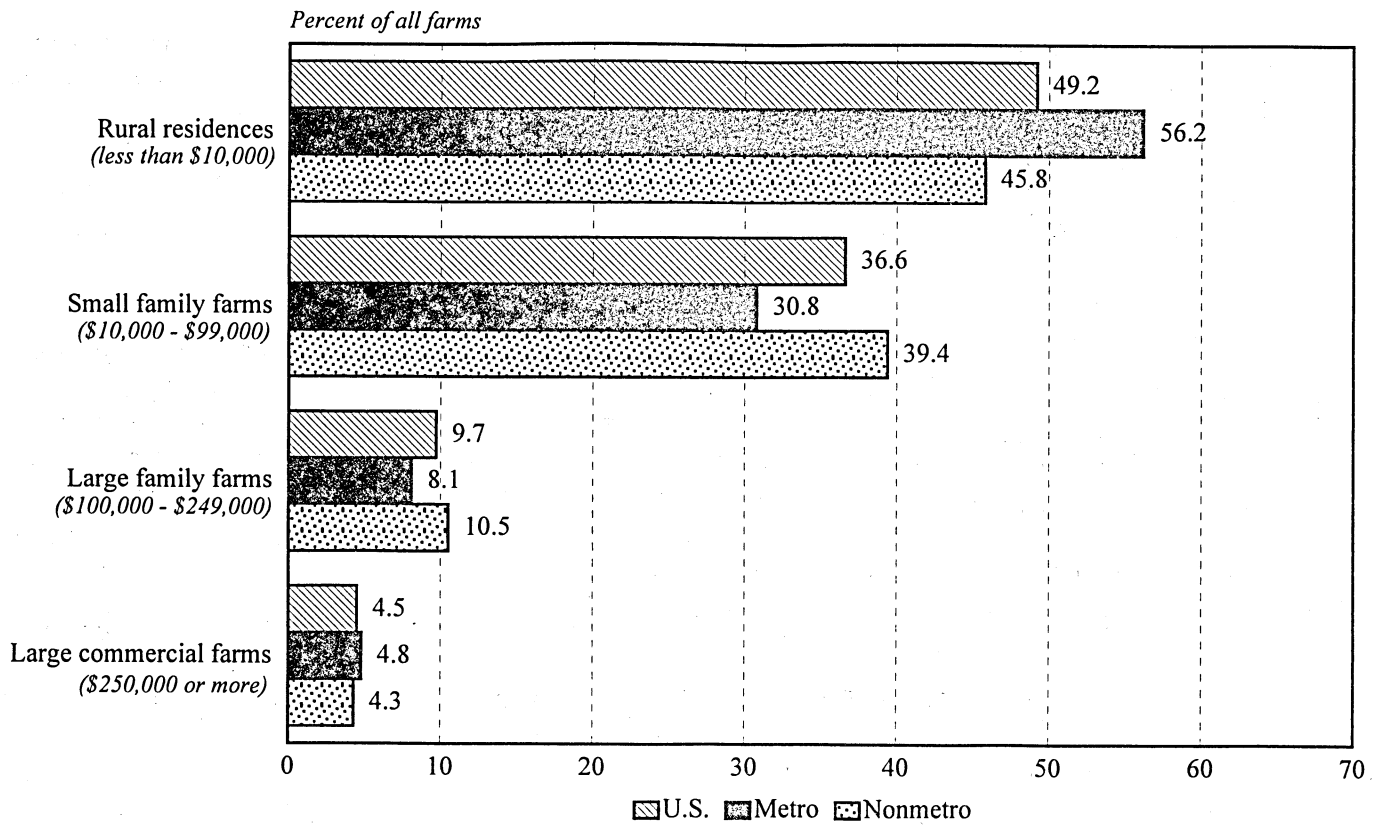
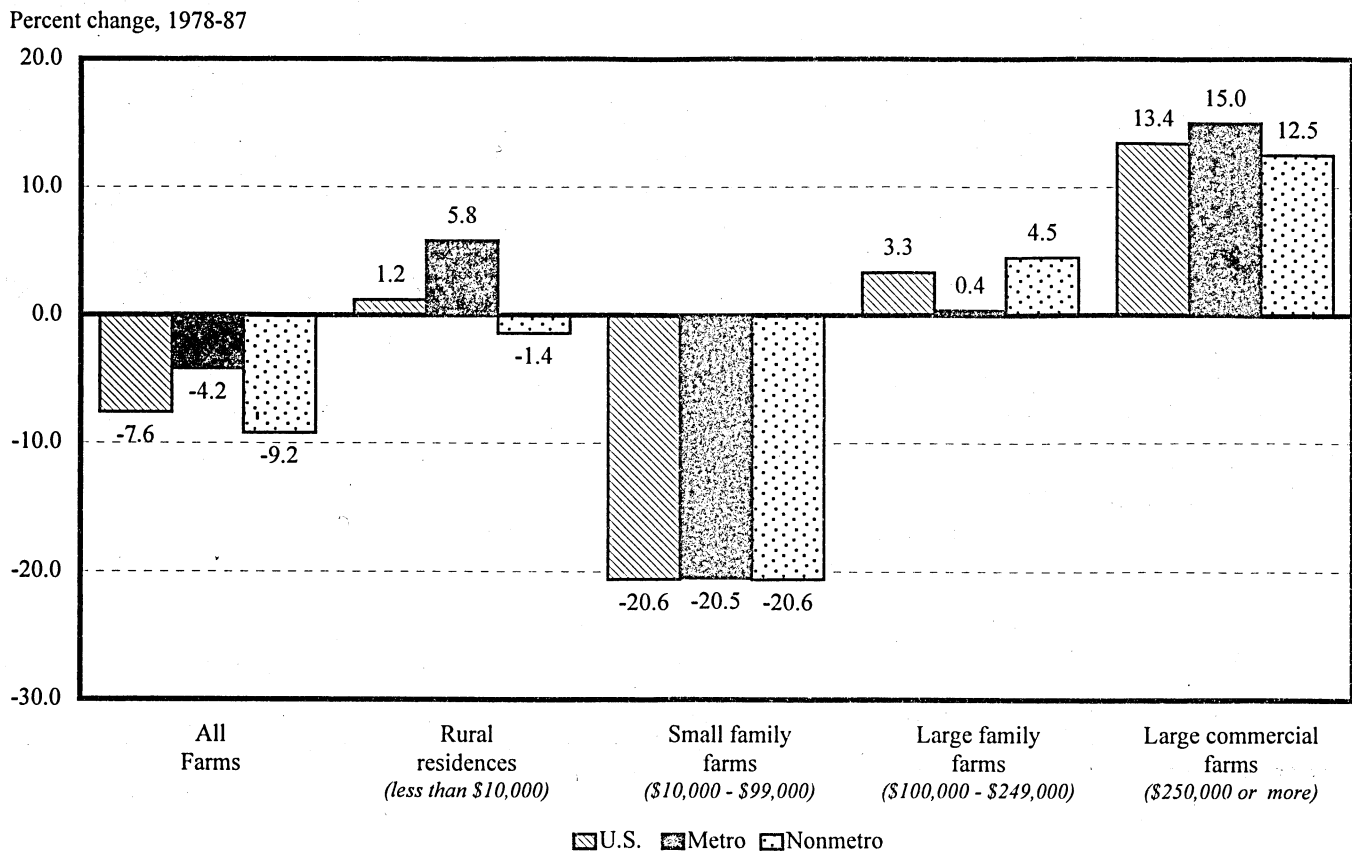


Figure 5

Change in the number of farms in metro and nonmetro counties, by sales class, 1978-87



Large Family Farms

Large family farms (farm product sales of \$100,000 - \$249,000) constituted 9.7 percent of all U.S. farms in 1987, and their numbers increased by 3.3 percent during 1978-87. They accounted for similar proportions of all farms in metro (8.1 percent) and nonmetro counties (10.5 percent). Regionally, they were most important in the Midwest (13.0 percent of all farms) and least important in the South (6.0 percent). Growth rates during 1978-87 of large family farms were higher in nonmetro counties (4.5 percent) than in metro counties (0.4 percent), and, regionally, growth rates ranged from growth of 14.2 percent in the Northeast to a decline of 11.6 percent in the South.

Large Commercial Farms

The number of large commercial farms (farms with sales of more than \$250,000) grew by 13.4 percent during 1978-87, with growth rates in metro counties (15.0 percent) somewhat higher than in nonmetro counties (12.5 percent). Regionally, large commercial farms were most important in the West, where they constituted 7.6 percent of all farms. In metro areas of the West, large commercial farms constituted 9.5 percent of all farms, (more than twice their national share), reflecting the presence of large, intensively managed farming operations within the metro areas of the West Coast and in Arizona. Growth rates of large commercial farms ranged from 25.6 percent in the Northwest to 6.0 percent in the Midwest.

Off-Farm Employment

Off-farm employment can add a substantial degree of financial stability to the farm operator. Metropolitan areas provide greater opportunities for off-farm employment. This may explain in part the smaller decline in the number of farms in metro counties and nearby counties than in all other counties. For the Nation, 45.5 percent of farm operators were principally employed in nonfarm occupations, with 35.3 percent of all farm operators spending 200 or more days working off the farm (table 1).

With the availability of jobs nearby, farm operators in metro areas are more likely to be able to find and hold a nonfarm job while still taking care of the farm. Just over half (51.8 percent) of farm operators from metro counties reported nonfarming principal occupations versus 42.4 percent for nonmetro farm operators. A similar pattern was found for days worked off the farm, with 40.1 percent of metro farm operators working 200 days or more off the farm compared with 33.0 percent for nonmetro operators. The degree of urbanization or proximity to a metro county also has an effect on the number of operators with off-farm principal occupations and number of days worked off the farm. Fifty-five percent of farm operators from large metro counties were principally employed in nonfarm occupations, compared with 50.1 percent for farm operators in other metro counties. For nonmetro counties, 45.6 percent of farm operators from counties adjacent to metro areas were principally employed in nonfarming occupations compared with 39.2 percent for operators in counties not adjacent to metro areas. As before, the same pattern followed for days worked off the farm.

Regional location had only minor effects on off-farm employment, except for the South. The percentage of farm operators with nonfarm principal occupations in the South was 55.4 percent, while the percentage for other regions ranged from 39.5 percent in the Midwest to 45.7 percent in the West.

Intensity of Farm Sales and the Mix of Farm Enterprises

The volume of farm sales for an individual farm is a function of the size of the farm in acres and the intensity of production as measured by sales per acre. Although farms in metro areas were less than half the size of farms in nonmetro areas, sales per acre from farms in metro areas (\$257) were over twice sales per acre from farms in nonmetro areas (\$114). Likewise, sales per farm were higher in metro areas (\$68,194) than in nonmetro areas

Table 1--Farm operators with off-farm principal occupations and 200 days or more off-farm employment, 1987¹

Item	United States	Northeast	South	Midwest	Plains	West
Operator's principal occupation not farming:				<i>Percent</i>		
All counties	45.5	43.3	55.4	39.5	43.0	45.7
Metro, total	51.8	45.0	58.2	45.9	57.9	52.0
Large metro	55.3	49.9	58.7	49.4	65.2	58.3
Other metro	50.1	41.4	58.1	43.9	53.9	47.8
Nonmetro, total	42.4	40.7	54.0	36.8	39.0	40.0
Adjacent to metro	45.6	41.1	54.1	38.0	48.6	45.1
Not adjacent to metro	39.2	39.7	53.9	35.2	31.8	37.5
Operator employed 200 or more days off-farm:				<i>Percent</i>		
All counties	35.3	33.6	41.1	32.6	33.3	34.7
Metro, total	40.1	35.0	43.3	38.0	43.8	39.5
Large metro	42.3	38.1	43.5	40.3	48.7	43.0
Other metro	39.0	32.7	43.2	36.8	41.2	37.2
Nonmetro, total	33.0	31.4	40.1	30.3	30.5	30.5
Adjacent to metro	35.6	31.6	40.7	31.7	36.9	33.4
Not adjacent to metro	30.5	30.9	39.4	28.4	25.6	29.1

¹Data exclude Alaska and Hawaii.
Source: Census of Agriculture, 1987.

(\$63,483). This metro-nonmetro difference in intensity of production (sales per acre) stemmed from higher valued commodities such as nursery and greenhouse products and dairy being favored by metro farms while nonmetro farms, as a group, tended to produce lower value farm commodities, such as grains and cattle and calves. In 1987, nursery and greenhouse products constituted 9.7 percent of all farm sales in metro areas compared with less than 1 percent in nonmetro areas (fig. 6). Nursery and greenhouse products comprised 20 percent of all farm sales for farms in large metro areas -- over five times the national share. The sale of dairy products comprised 15 percent of all farm sales in metro areas compared to 10 percent in nonmetro areas. On the other hand, the share of sales from cattle and calf enterprises, which generally have low sales per acre, was much higher in nonmetro counties than in metro counties. For instance, sales of cattle and calves were more than twice as important to farms in nonmetro areas, comprising 32.3 percent of all sales, as metro farms (15.2 percent).

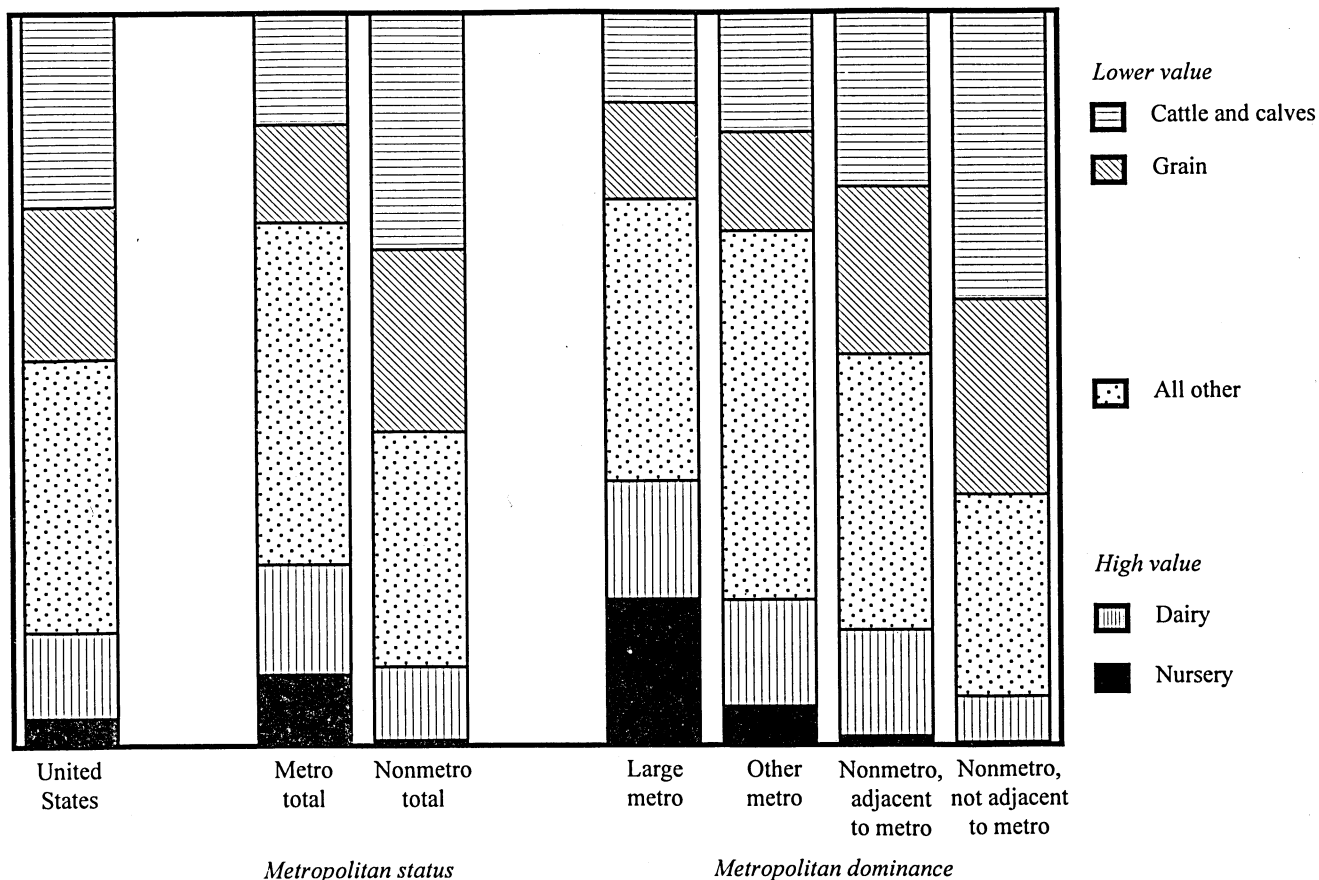
Differences in sales intensity and mix of farm enterprises is more dramatic across different types of metro and nonmetro counties. Arranged by metro dominance, sales per acre ranged from a high of \$300 per acre for farms in large metro areas to \$94 per acre for farms in nonmetro counties not adjacent to a metro area.

Regionally, sales per acre ranged from \$371 per acre in the Northeast to \$93 per acre in the Plains. These large differences can also be explained by differences in commodity mix. In the Northeast, production of nursery and greenhouse products accounted for 11.2 percent of all sales and dairy for 36.2 percent. Together, these two

Figure 6

The importance of high-valued commodities to farm sales, metro and non-metro counties, 1987

Percent of farm sales from high-valued and lower valued commodities



high-valued commodities comprised 47.4 percent of all sales in the Northwest compared with 4.6 percent in the Plains. Conversely, grains and cattle and calves together accounted for over three-fourths (77.7 percent) of all sales in the Plains versus 14 percent in the Northeast (see appendix table 3).

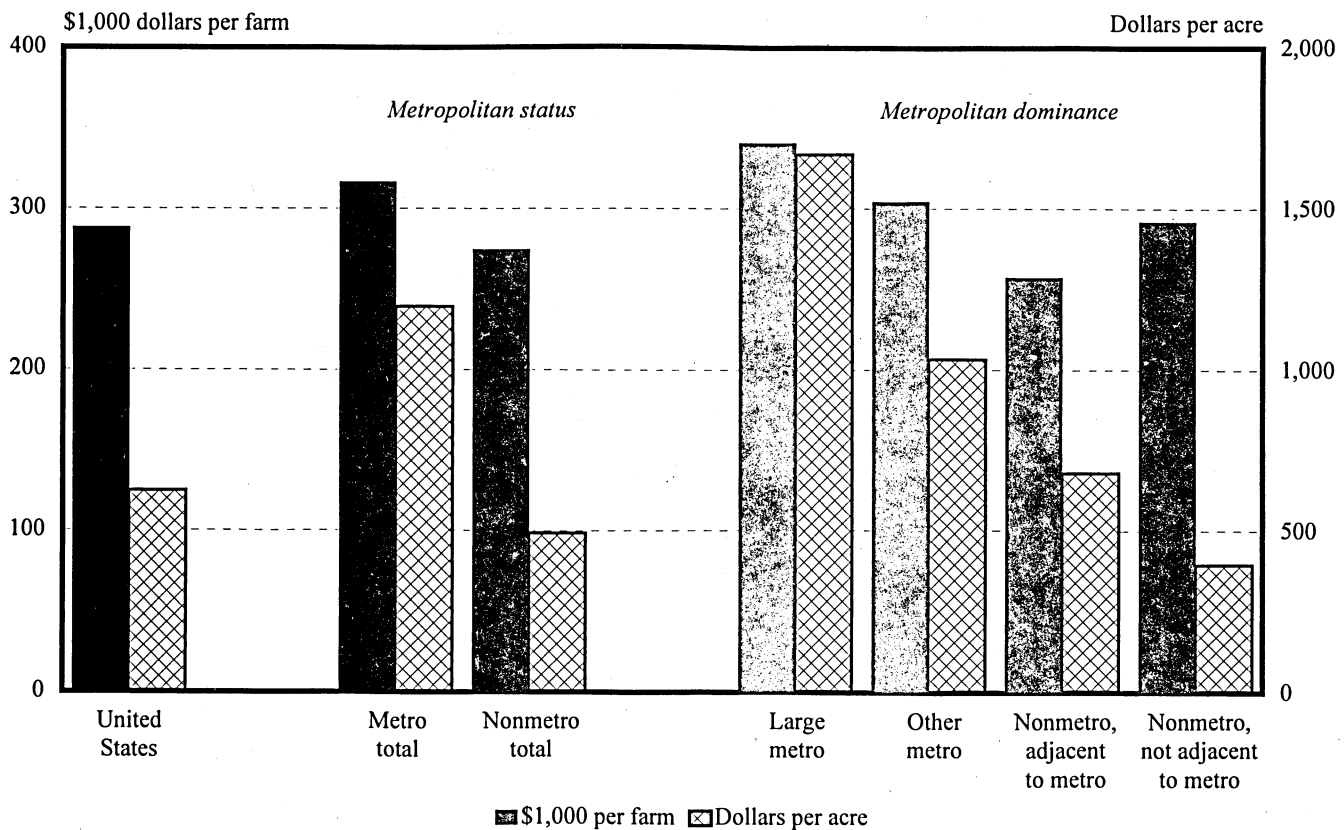
Value of Farmland and Buildings

The value of real estate assets (land and buildings) of the average U.S. farm was \$288,313 in 1987. The metro per farm value of \$316,493 was 15 percent greater than the value of the average nonmetro farm (\$274,616) even though metro farms were roughly half the size of the average nonmetro farm (fig. 7). The influence of urbanization on farm asset values is reflected in per acre farmland values in metro counties (\$1,196) being almost 2.5 times those in nonmetro counties (\$493) in 1987. Per acre values ranged from a high of \$1,669 for farmland in counties of large metro areas to \$396 in nonmetro counties not adjacent to metro areas. During the 1978-87 period, per acre farmland values rose nominally by 15 percent in metro areas but declined by 5.7 percent in nonmetro counties (fig. 8). Nominal farm asset value changes per acre ranged from an increase of 22.5 percent for farms in the large metro areas to a decline of 7.5 percent in nonmetro counties not adjacent to a metro area.

Regionally, the average value of land and buildings per farm ranged from nearly a half million dollars (\$485,409) in the West to \$210,914 in the South. Per acre, the value of land and buildings ranged from \$1,578 in the Northeast to \$431 in the West. Differences in changes in the value of assets during 1978-87 across regions were substantial, reflecting not only the positive influence of urbanization on the land but also the negative

Figure 7

Average value of land and buildings on U.S. farms in metro and nonmetro counties, 1987



influences of the farm crisis of the early and mid-1980's. Farm asset value changes on a per acre basis ranged from increases of 43.7 percent in the highly metro Northeast to a decline of 25.5 percent in the Midwest where the financial crisis of the 1980's was most pronounced (see app. table 4). The average farm in the Midwest lost almost a fifth of its value between 1978 and 1987, while the value of the average Northeast farm rose by more than a third.

Property Taxes

Per acre property taxes on farms in metro areas (\$6.29) were more than double those of farms in nonmetro counties (\$2.51) and four times greater in counties most influenced by urbanization (large metro areas) than in nonmetro counties not adjacent to a metro area. But those differences were largely offset by higher sales per acre in counties more influenced by metropolitan forces (fig. 9). Property taxes paid per \$100 of farm sales were only slightly higher in metro counties (\$2.44) than in nonmetro counties (\$2.20). Clearly, the ability of metro farms to produce higher valued farm products offsets the economic disadvantage of higher property taxes.

Regionally, per acre property taxes were highest in the Northeast (\$11.39) and Midwest (\$6.76) and lowest in the Plains (\$1.79). But again the impact on farm profitability of these large regional differences is dampened by differences in regional sales intensity. Property taxes per \$100 of farm sales ranged from \$3.07 in the Northeast to \$1.70 in the South (see app. table 4).

Figure 8

Change in value of land and buildings on U.S. farms in metro and nonmetro counties, 1978-87

Percent change in per acre value

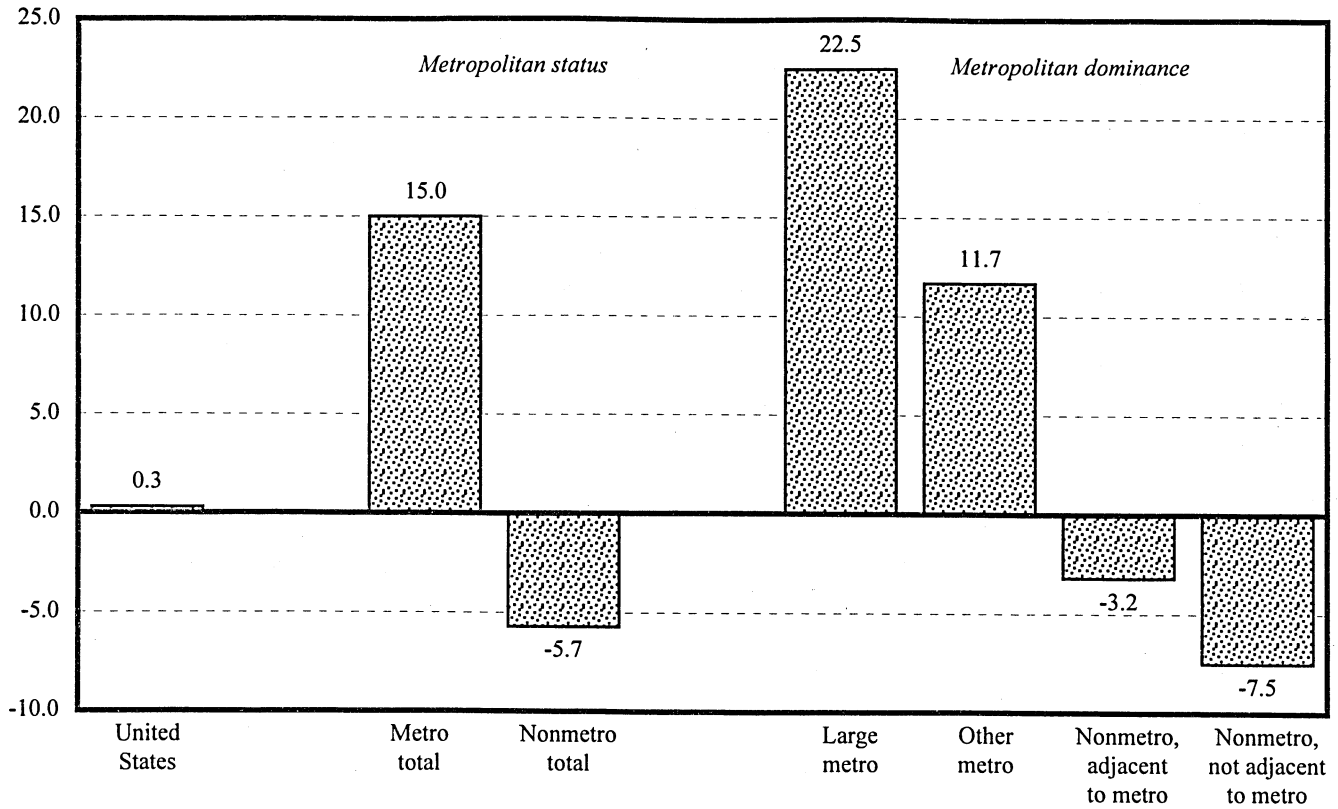
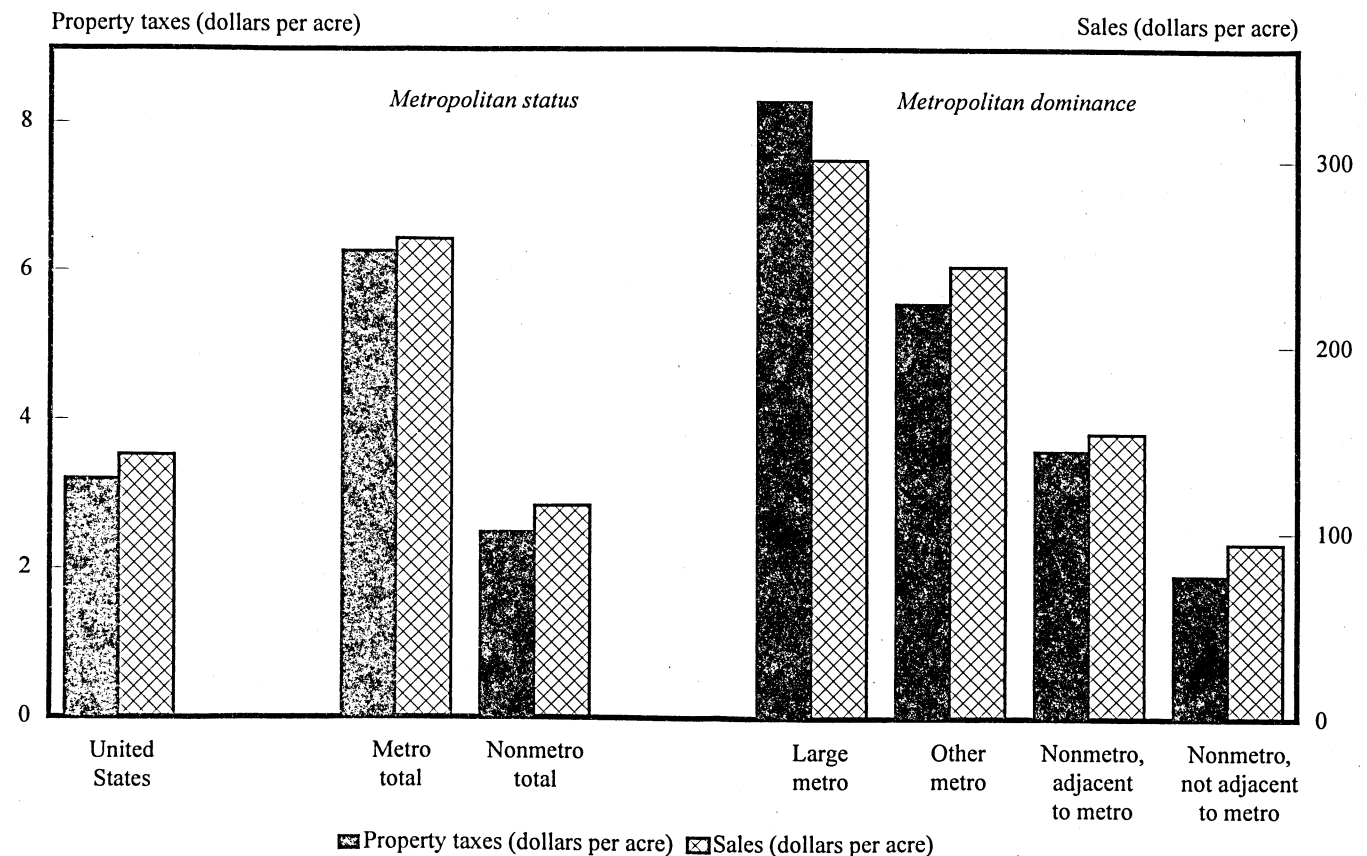


Figure 9

Property taxes paid and sales per acre on U.S. farms in metro and nonmetro counties, 1987



Interest Paid on Real Estate Debt

Differences in interest paid on real estate debt across metro and nonmetro counties and regions result from differences in the value of real estate assets, debt-to-asset ratios, and interest rates. The Census of Agriculture does not contain information on debt-to-asset ratios or interest rates, but by comparing total interest payments to farm acres and sales, some insights can be gained into the relative importance of farm real estate debt load across groups of counties. Interest payments per acre were twice as high in metro as in nonmetro counties. The impact, however, was negated by metro-nonmetro differences in sales intensity, just as it was with property taxes. Per \$100 of sales, interest on real estate was slightly lower in metro counties (\$3.86) than in nonmetro counties (\$4.22). Regionally, interest payments on real estate debt per \$100 of sales ranged from \$5.12 in the Midwest to \$3.43 in the Northeast (see app. table 4).

Summary and Conclusions

The long-term nationwide trend of decline in farm numbers and increase in average farm size continued in 1978-87 with farm numbers declining by 7.6 percent and average farm size increasing by 2.9 percent. Technological advances such as improved fertilizer, pesticides, and plant varieties, along with new management techniques, have been the chief force behind the national trends. At the sub-national level, the structure of farming has also been impacted by urbanization and the growth of urban and metropolitan areas. There are tradeoffs between the benefits and drawbacks of urbanization and growth. Some of these benefits include increased job opportunities, farmland appreciation, and closer proximity to markets for farm products. Drawbacks, however, are more competition for labor, higher taxes, and decreased access to major suppliers of farm inputs. These tradeoffs have yielded different trends in farm structure in metro and nonmetro areas and counties arranged by metropolitan dominance. While trends in nonmetro areas followed national trends of fewer and larger farms, they were in contrast to trends in metro counties, where the number of farms fell by only 4.2 percent and the average farm size declined by 4.1 percent. Although regional differences in farm structure complicate metro-nonmetro comparisons, the greater availability off-farm employment in metro areas and in areas with some metro dominance helps explain the smaller decline in metro farm numbers. The viability of many farms, particularly smaller farms, depends on the availability of nonfarm jobs more than on farm prices and policies. About half of all farm operators had nonfarm occupations, although the incidence was higher in metro counties (51.8 percent) than in nonmetro counties (42.4 percent), highest in counties with the most metropolitan dominance (55.3 percent), and least in nonmetro counties not adjacent to metro areas (39.2 percent).

Farm viability is a function of farm size and nonfarm sources of income and employment. Rural residences (farm sales of less than \$10,000), which rely heavily on nonfarm employment, have increased substantially, particularly in large metro areas where jobs are more readily available. Small family farms (sales of \$10,000-\$99,999), whose numbers declined by one-fifth during 1978-87, are often caught in a farm-nonfarm dilemma, where conflicts arise for the operator over time spent working on and off the farm. The number of large family farms (sales of \$100,000-\$249,999) increased moderately for 1978-87, nationwide. Large commercial farms (sales of \$250,000 or more), where returns to scale are most apparent and employed to an economic advantage, increased in number substantially during the 1978-87 period. While the number of all U.S. farms declined by 7.6 percent, large commercial farms grew in number by 13.4 percent.

Differences in farm structural changes among regions resulted from regional differences in the competitive advantages in the production of various farm commodities as well as in the degree of regional urbanization and nonfarm job availability. Changes in farm numbers and average farm size ranged from a growth in the number of farms (9.5 percent) and a reduction in farm size (12.2 percent) in the West to a decrease in farm numbers (12.8 percent) with an increase in size (9.2 percent) in the Midwest. In the West, growth in overall farm numbers resulted from dramatic growth in nonfarm job-dependent rural residences (23.7 percent) and large highly competitive commercial farms (18.7). The decline in farm numbers in the Midwest resulted from declines in the

number of rural residences and small family farms, despite some growth of bigger, more commercial farms which suffered through the financial crisis of the early 1980's.

The higher intensity of farm sales (per acre) in metro areas offset the potential for more economic stress stemming from higher values, higher property taxes, and high debt load on farms in metro areas. While the average nonmetro farm was twice as large as the average metro farm, there was little metro-nonmetro difference in sales per farm. And, per farm value of land and buildings in metro areas was larger than in nonmetro areas since metro per acre values were more than double those in nonmetro areas. The higher sales per acre in metro areas results from an enterprise mix that favors higher valued commodities such as nursery and greenhouse products and dairy in contrast to the more land-intensive grain and beef cattle operations that dominate farming in many nonmetro areas. Although per acre expenses for property taxes and real estate are roughly twice as high in metro areas, when the higher sales intensity is considered (when expenses are calculated on an expense per \$100 sales basis), little metro-nonmetro difference exists, suggesting that metro farms are not disadvantaged by their higher valued assets.

The U.S. farm sector is linked to national and global economic forces that determine farm output and prices on the one hand and regional and local trends that determine the extent of nonfarm competition for farm resources on the other. In terms of overall farm structure, national and global economic forces lead to larger, but fewer, more efficient, farm units. Links to the regional and local nonfarm economy often lead to smaller farm units partially supported by nonfarm jobs and income. For areas dominated by the forces of urbanization, growth in overall farm numbers, particularly smaller farms, results from the growth of nonfarm jobs to help support farming units. The viability of many farms is dependent upon nonfarm jobs. For many smaller farms, success in allocating resources between farm and nonfarm uses in an urbanizing environment is the key to their survival. For other, larger, more commercial farms, their success depends on the efficient use of farm resources in the traditional farm environment of ever-changing technology and farm policy and growing global competition. The various forces impacting the farm sector reflect the difficulty of gaining insights into future farm structure. But farm location relative to growing, dominant, metro areas will become even more important to overall farm viability and future farm structure.

Appendix table 1--Changes in the number of farms, land in farms, and size of farms, metro and nonmetro counties, by region, 1978-87¹

Item	Number of farms		Land in farms		Acres per farm	
	1987	Change 1978-87	1987	Change 1978-87	1987	Change 1978-87
	<i>Thous.</i>	<i>Percent</i>	<i>Mil. acres</i>	<i>Percent</i>	<i>Acres</i>	<i>Percent</i>
United States	2,253.1	-7.6	960.3	-4.9	461	2.9
Metro	710.6	-4.2	180.3	-8.1	265	-4.1
Large	226.5	-0.4	46.1	-10.6	204	-10.3
Other	484.1	-5.9	134.2	-7.2	295	-1.4
Nonmetro	1,542.5	-9.2	780.0	-4.1	557	5.6
Adjacent to metro	772.8	-9.0	265.4	-5.1	377	4.3
Not adjacent to metro	769.7	-9.4	514.6	-3.6	738	6.4
Northeast	150.5	-6.2	24.4	-9.6	173	-3.7
Metro	88.5	-4.4	12.5	-9.2	148	-4.9
Nonmetro	61.9	-8.6	11.9	-10.1	211	-1.7
South	630.5	-13.2	116.1	-12.3	212	1.1
Metro	193.3	-9.7	31.8	-13.2	183	-3.8
Nonmetro	437.2	-14.8	84.3	-12.0	226	3.3
Midwest	758.2	-12.8	174.0	-4.8	263	9.2
Metro	222.4	-11.7	42.2	-5.7	215	6.8
Nonmetro	535.8	-13.2	131.9	-4.5	284	10.1
Plains	464.7	-1.1	338.5	-2.7	736	-1.7
Metro	91.4	5.9	37.2	-6.9	385	-12.2
Nonmetro	373.3	-2.8	301.2	-2.2	830	0.6
West	249.2	9.5	307.2	-3.8	1125	-12.2
Metro	114.9	12.1	56.5	-7.3	439	-17.3
Nonmetro	134.3	7.3	250.7	-3.0	1739	-9.6

¹Data exclude Alaska and Hawaii.

Source: Census of Agriculture, 1978 and 1987.

Appendix table 2--Change in farm numbers by sales class, metro and nonmetro counties, by region, 1978-87¹

Item	All farms	Rural residences ²	Small family farms	Large family farms	Large commercial farms	All farms	Rural residences	Small family farms	Large family farms	Large commercial farms
	Percent change 1978-87					Percent				
United States	-7.6	1.2	-20.6	3.3	13.4	100.0	49.2	36.6	9.7	4.5
Metro	-4.2	5.8	-20.5	0.4	15.0	100.0	56.2	30.8	8.1	4.8
Large	-0.4	12.3	-19.8	-5.7	6.4	100.0	61.2	27.7	6.7	4.5
Other	-5.9	2.5	-20.8	2.8	19.3	100.0	53.7	32.4	8.9	5.0
Nonmetro	-9.2	-1.4	-20.6	4.5	12.5	100.0	45.8	39.4	10.5	4.3
Adjacent to metro	-9.0	-0.9	-21.8	3.6	16.2	100.0	49.3	36.8	9.8	4.1
Not adjacent to metro	-9.4	-2.1	-19.6	5.3	9.4	100.0	42.3	42.0	11.2	4.5
Northeast	-6.2	2.4	-23.6	14.2	25.6	100.0	50.7	32.6	11.8	4.9
Metro	-4.4	5.5	-22.4	11.4	23.6	100.0	52.6	31.9	10.7	4.8
Nonmetro	-8.6	-2.3	-25.2	17.7	28.6	100.0	47.8	33.6	13.4	5.1
South	-13.2	-7.1	-27.8	-11.6	17.4	100.0	63.9	26.2	6.0	4.0
Metro	-9.7	-1.4	-27.8	-16.9	13.5	100.0	67.0	23.9	5.2	4.0
Nonmetro	-14.8	-9.7	-27.9	-9.3	19.3	100.0	62.4	27.3	6.4	4.0
Midwest	-12.8	-4.9	-23.1	4.9	6.0	100.0	38.0	44.9	13.0	4.1
Metro	-11.7	-4.2	-23.1	4.5	9.1	100.0	44.7	40.2	11.3	3.8
Nonmetro	-13.2	-5.3	-23.1	5.0	4.8	100.0	35.2	46.9	13.8	4.1
Plains	-1.1	12.3	-15.0	8.1	10.3	100.0	47.0	40.5	8.9	3.6
Metro	5.9	20.7	-16.5	-1.6	1.9	100.0	65.2	27.5	5.0	2.3
Nonmetro	-2.8	9.1	-14.7	9.5	11.8	100.0	42.2	44.0	9.9	4.0
West	9.5	23.7	-6.6	6.8	18.7	100.0	50.0	32.9	9.5	7.6
Metro	12.1	23.5	-4.0	2.6	20.0	100.0	54.7	27.8	8.0	9.5
Nonmetro	7.3	23.8	-8.2	9.8	16.8	100.0	45.8	37.5	10.7	6.0

¹Data exclude Alaska and Hawaii.

²Farms are grouped by sales category as follows: Rural residence = sales of less than \$10,000; Small family farm = sales of \$10,000-\$99,000; Large family farm = sales of \$100,000-\$249,999; Large commercial farm = sales of \$250,000 or more.

Source: Census of Agriculture, 1978 and 1987.

Appendix table 3--Agricultural sales from selected products, metro and nonmetro counties, by region, 1987¹

Item	Sales per farm	Sales per acre	Percent of sales from					
			Crops and nursery products	Grains	Nursery and greenhouse products	Livestock, poultry, and their products	Cattle and calves	Dairy
	-----Dollars-----		-----Percent-----					
United States	65,023	141	43.2	21.0	3.8	56.9	26.5	11.7
Metro	68,194	258	52.8	13.4	9.7	47.2	15.2	15.0
Large	61,266	300	56.8	13.2	20.0	43.2	12.4	16.1
Other	71,624	243	51.2	13.6	5.3	48.8	16.4	14.5
Nonmetro	63,483	114	38.1	24.9	0.7	61.9	32.3	10.0
Adjacent to metro	57,515	153	39.2	23.0	1.2	60.8	23.9	14.5
Not adjacent to metro	69,499	94	37.1	26.5	0.4	62.9	39.4	6.2
Northeast	64,202	371	31.6	5.6	11.2	68.4	8.4	36.2
Metro	63,141	427	40.1	6.2	16.9	59.9	8.4	32.1
Nonmetro	65,787	312	19.3	4.9	3.1	80.7	8.5	42.2
South	46,723	220	46.5	12.6	5.0	53.5	11.6	7.2
Metro	51,709	283	53.8	7.0	11.5	46.2	9.8	5.9
Nonmetro	44,388	196	42.6	15.7	1.5	57.5	12.6	8.0
Midwest	59,858	228	45.1	38.0	1.8	54.9	16.8	15.6
Metro	54,742	255	49.1	35.8	5.9	50.9	14.2	18.3
Nonmetro	62,018	219	43.7	38.8	0.3	56.3	17.7	14.5
Plains	68,112	93	31.2	22.1	0.8	68.8	55.6	3.8
Metro	38,265	100	42.5	21.4	4.2	57.6	42.0	5.8
Nonmetro	76,074	92	29.6	22.2	0.3	70.4	57.4	3.5
West	109,433	97	53.6	9.0	6.4	46.4	27.0	11.2
Metro	136,839	312	60.6	3.6	10.0	39.4	15.0	14.3
Nonmetro	84,948	49	43.5	16.7	1.1	56.5	44.2	6.8

¹Data exclude Alaska and Hawaii.
Source: Census of Agriculture, 1987.

Appendix table 4--Value of land and buildings, property taxes and interest paid, metro and nonmetro counties, by region, 1978-87¹

Item	Value of land and buildings				Property taxes paid		Interest paid on real estate	
	Per farm		Per acre		Per acre	Per \$100 of sales	Per acre	Per \$100 of sales
	1987	Change 1978-87	1987	Change 1978-87				
	<i>Thous. Dols</i>	<i>Percent</i>	<i>Dollars</i>	<i>Percent</i>	<i>Dollars</i>			
United States	288,313	3.2	625	0.3	3.22	2.28	5.78	4.10
Metro	316,493	10.3	1196	15.0	6.29	2.44	9.95	3.86
Large	340,973	9.9	1669	22.5	8.31	2.77	10.77	3.59
Other	304,372	10.2	1033	11.7	5.59	2.30	9.67	3.98
Nonmetro	274,616	-0.5	493	-5.7	2.51	2.20	4.81	4.22
Adjacent to metro	257,425	1.0	682	-3.2	3.61	2.37	6.61	4.34
Not adjacent to metro	291,949	-1.6	396	-7.5	1.94	2.05	3.88	4.12
Northeast	272,906	38.4	1578	43.7	11.39	3.07	12.71	3.43
Metro	298,441	35.1	2020	42.1	13.80	3.23	14.46	3.38
Nonmetro	234,740	43.6	1114	46.1	8.86	2.84	10.89	3.49
South	210,914	19.0	994	17.7	3.75	1.70	8.14	3.70
Metro	263,852	29.5	1446	34.6	5.50	1.94	9.91	3.50
Nonmetro	186,119	12.4	823	8.8	3.09	1.57	7.48	3.81
Midwest	247,060	-18.7	939	-25.5	6.76	2.97	11.65	5.12
Metro	259,149	-14.2	1207	-19.7	8.92	3.50	13.05	5.12
Nonmetro	241,956	-20.6	853	-27.8	6.07	2.78	11.20	5.12
Plains	327,443	6.4	445	8.2	1.79	1.93	3.18	3.43
Metro	318,550	11.8	828	27.2	2.69	2.70	4.00	4.02
Nonmetro	329,816	5.2	397	4.6	1.68	1.83	3.08	3.36
West	485,409	5.6	431	20.2	1.93	1.99	3.87	3.97
Metro	485,510	7.7	1106	30.3	5.47	1.76	10.58	3.39
Nonmetro	485,318	3.8	279	14.8	1.13	2.32	2.35	4.81

¹Data exclude Alaska and Hawaii.

Source: Census of Agriculture, 1978 and 1987.

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