APPENDIX

The Changing Status of Farms and Ranches of the Middle

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Introduction

American agriculture is changing dramatically. Consolidation is occurring at all levels of production, processing, distribution, and retailing. The rapid pace of consolidation makes it difficult to get an accurate picture of the current structure of agriculture. This chapter will use two primary sources of data to focus on the changes occurring in production agriculture. The first is the 2002 U.S. Department of Agriculture (USDA) Census of Agriculture and the second reflects data compiled by the USDA Economic Research Service (ERS). It is important to remember the definition of a farm used in these data sets and to acknowledge the changes that occurred in compiling the 2002 Census. These changes severely restrict comparisons with earlier years, with the exception of the revised 1997 Census numbers.

A farm is defined as “any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the Census year.” This definition was first used in the 1974 Census. The data presented here contains a category for farms with sales of less than the $1,000. This is because farms covered in the Census only needed the ability to sell at least $1,000, even though they may not have actually sold this amount during the Census year.

The 2002 Census augmented the normal Census mailing list with an “. . . independent comprehensive survey of sample geographic areas.” The purpose was to increase the number of
names on the list, especially those of small farm operators. The USDA notes, “Most farms missed on the mail list are relatively small operations.” The new Census mailing list was quite successful in capturing results from additional small farms. Overall, when the original 1997 numbers were readjusted for the new list, there was a 16 percent increase in the number of farms reported. The number of farms reporting sales of less than $1,000 increased by 50 percent. This represented 45 percent of the total increase in farms reported for 1997.

The change in the sampling procedure for the Census has altered the nature of the Census data. It is arguable whether or not this was a desirable change, but it is quite obvious that given the current definition of a farm, the change did capture considerably more farms. Farms with sales of less than $1,000 make up 27 percent of all U.S. farms, operate 9 percent of the land and account for 0.4 percent of all sales. There was a 3.9 percent decrease reported in the number of all farms. But, excluding the increase in the farms with sales of less than $1,000, the decrease in farm numbers was 13 percent. Irrespective of its potential shortcomings, the Census does provide the most comprehensive examination of the current state of U.S. agricultural production and changes since 1997.

**Farm Size and Numbers**

Currently there are 2,128,982 farms in the United States, operating on just over 938 million acres. The number of farms in the United States decreased by 3.9 percent from 1997 to 2002 and the land in farms decreased by 1.7 percent over the same time.

The 2002 Census presented a breakdown of farms related to size in two different ways. One was by the amount of sales which has been the traditional way to measure size. A new categorization of farms by economic class was introduced with the 2002 Census. The difference
between the two measures is that government payments are excluded in the Economic Classification. Figure 1 compares the percentage of farms using the two classification schemes. Notice that regardless of the classification system, most farms fall into the category of less than $1,000 in sales. Slightly more than one-fourth (27 percent) of the farms recorded sales of less than $1,000 and 20 percent of the farmers are in the economic class of less than $1,000. As expected, the percentage of farms in the smaller classes changes slightly as government payments are added, but beyond the $50,000 range there is essentially no change in the percent of farms using either classification system.

The remainder of this chapter will use the sales categorization in discussions since this is the more traditional way to discuss farm structure. Using economic class will increase, decrease or leave unchanged the percent of farms relative to the sales categorization, so the impact would be ambiguous.

Figure 2 records the changes that have occurred in farm numbers by sales class since 1997. This figure also presents the change in the percent of sales attributable to the various sales categories. Notice that the very small farms (sales less than $1,000) increased by 37 percent and the very large farms (sales greater than $1 million) increased by 8 percent. This illustrates the phenomenon of the disappearing middle.

Figure 2 also shows that the percentage of sales in all categories, except the very largest, showed a decrease. The percentage change in farm numbers and sales is approximately the same except for the very small and very large farms. For the entire production agriculture sector overall, sales were essentially unchanged, decreasing less than one-half of a percent.
The Census definition and listing skew the ability to make some general comparisons. This is because the average numbers include the very small size farms and as shown in Figure 2, this will have significant influence. Therefore, for the remainder of this chapter the discussion will focus on three categories of farms. The first category, sales less than $50,000, represents farms that are small. These farms will certainly have off-farm income. In addition, as shown in Figure 3, while this group represents almost 80 percent of the farms they constitute less than 10 percent of the sales. The second category of farms considered is those with sales between $50,000 and $500,000. Finally, the last group is those farms with sales over $500,000. Any division is arbitrary and can be debated. However, what we are trying to accomplish with this three-way division is to simplify the comparisons and to be more reflective of a non-commercial, small commercial, and large commercial triad division. The farms between $50,000–$500,000 approximate what is being called the agriculture-of-the middle.

Figures 3 and 4 compare the relative levels of sales and the amount of land held by sales category, respectively. As expected, the farms in the smallest sales category represent the smallest percent of sales. The largest single category, those with sales greater than $500,000, had just over 60 percent of the sales. Figure 4 shows that almost half (46 percent) of the land is held by those in the three sales categories from $50,000 to $500,000.

When the sales categories are aggregated, the 79 percent of farms with sales under $50,000 represent 6.8 percent of the total sales and farm 33 percent of the land. The farms with sales over $500,000 comprise 1.3 percent of the farms with 60 percent of the sales and 20 percent of the land. In addition to holding nearly one-half of agricultural land, the 18 percent of enterprises designated as farms and ranches of the middle account for 32 percent of agricultural sales in 2002.
Farm Operator Characteristics

The average age of farmers was 55.3 in 2002. This was an increase of 1.3 years or 2.4 percent from 1997. Figure 5 shows the distribution of farmers by age category. Notice that the percentage of farmers in the 35- to 44-years-of-age cohort is equal to the percentage of farmers over the age of 70. It is not clear why the percentage of farmers in the age categories between these two would be decreasing, but it is possible that this reflects the long-term effects of the 1980 farm crisis. Twenty years ago the farmers in the lower two and most of the farms in the third age brackets would have been young children or teens. They would not own farms. The farmers in the over 70 age category would have been at the end of their farming careers, thus better able to survey the financial turmoil that was occurring in the early 1980s. The cohort of the farmers currently in the 50 to 69 year old brackets would have been the most likely to have been expanding up to the farm crisis. They also would have been more likely to want to expand during that time period. This is reflected in Figure 5.

The average age of farmers decreases as the size of farm increases. Farmers in the smallest sales class were 55.9 years of age, those in the middle were 53.1, and the farmers in the largest sales class were 52.3. There are many reasons for this age distribution. Many of the farmers in the smallest sales class are the retired or semi-retired farmers. Additionally, farmers in the larger sales classes would more likely be in the height of their careers.

The Census customarily inquires about the principal occupation for the operator. Unfortunately, the wording of the question was changed for the 2002 Census. As noted in the Census description “The proportion of principal operators claiming Farming or ranching as their primary operation increased significantly since 1997. While there are demographic changes which support this increase, there is a concern that a 2002 forms design change may have also
contributed to it.” Due to this potential problem, the principal occupation data is not presented here but it is assumed that days working off the farm can be used in its stead.

Figure 6 presents the percentage of farmers based on the number of days they reported working off the farm. The majority of farmers report at least some off-farm income. But the divisions between those working off the farm more than 200 days, or essentially full-time, and those reporting no work off the farm were almost equal, 40 and 45 percent, respectively.

Not surprisingly the distribution of farms within a sales class who report no off-farm work is heavily skewed towards the larger farms. For farms with sales greater than $500,000, 78 percent reported no off-farm work, whereas for farms with sales less than $50,000, only 40 percent reported no off-farm work. Farms in the smallest sales category reported the most full-time employment while in the largest sales category just 10 percent of the farms reported full-time, off-farm employment.

One of the major changes that occurred in the 2002 Census was that data was collected regarding the number of operators per farm. As shown in Figure 7, nearly two-thirds (62 percent) of the farms reported having only one operator. This means more than one-third of U.S. farms can be considered multiple family farms.

The majority of operators, 89 percent, are males (Figure 8). However, when all operators are included, the percent of females increases from 11 to 27 percent. Remember that for most questions the Census is referring to the principal operator even though some information is gathered on all operators. Figure 8 also shows the distribution of operators by gender and sales class. Note that over 90 percent of the female principal operators are in the small farm sales category. The percent of principal operators who are female increased by 13 percent. This
reflects the increased coverage for the very small farms within the Census. Male principal operators decreased by 6 percent.

**Direct and Organic Sales**

The 2002 Census reported the number of farms and the levels of direct sales and sales from farms that were certified organic (Figure 9). This was the first time that questions were asked regarding organic sales. As noted in the Census explanation, “It was the intention of the question to collect only those products that were certified as organic by a government, grower organization, or similar entity.”

Direct sales were defined as those “sold directly to individuals for human consumption. This item represents the value of agricultural products produced and sold directly to individuals for human consumption from roadside stands, farmers' markets, pick-your-own sites, etc. It excludes non-edible products such as nursery crops, cut flowers, and wool but includes livestock sales.” It is not clear from the Census whether or not direct sales include organic products. However, it can be assumed that at least some of the organic sales would be direct.

Figure 10 shows the percent of farms and the percent of sales from farms reporting direct or organic sales; more than 5 percent of the farms reported direct sales and less than 1 percent reported organic sales. The sales in either category represented less than 1 percent of total agricultural sales in 2002. It is interesting to note that the percentage of direct sales increased by 37 percent from 1997 to 2002. It is not possible to make such a comparison for organic sales.

Only a small percent of farms within any sales category have either direct or organic sales. Figure 11 shows the percent of farms within each category with such sales. The smallest category, sales under $50,000, reported the highest percentage of farms (6 percent) with direct
The percentage of farms within the sales category reporting organic sales was fairly even across the sales categories.

Figure 12 shows the distribution of all farms with direct and organic sales by sales class. The majority of the farms are in the small sales categories. In spite of the high percentage of the farms present in the small sales class, the majority of sales come from the large sales class. Notice that more than half of all organic sales in 2002 were from farms with total sales of $500,000 or more.

Comparing Figure 12 and Figure 3 illustrates the changes underway in organic agriculture. They show that as organic agriculture becomes more widespread and generally available, the structure of organic agriculture is moving closer to the overall structure of agriculture. It is interesting to note the structure of direct sales as implied in Figure 13. We can see that most, over 40 percent, of the direct sales are made by farms in the middle sales category.

**Land Tenure**

Figure 13 shows that the majority of U.S. farms are full-owner farms; in other words, the operator owns all the land that is farmed. The majority of acres, however, are farmed by operators who own part but not all of the land they farm. Figure 14 shows that the category of tenant farmer, those who do not own any land, dropped significantly from 1997 to 2002. The land farmed by partial owners is almost equally divided between owned and rented land. Overall, the amount of acres farmed by the partial owners has dropped since 1997.

Figure 15 shows the division between owned and rented land in the United States. Just over 60 percent of the land in U.S. farms is farmed by the owner. There was a shift in land tenure between 1997 and 2002. From Figure 16 we can see that the percentage of land owned increased while the percentage of land rented actually decreased 8 percent from 1997 to 2002.
Overall, the amount of land in farms decreased approximately 2 percent over the same time period.

Full ownership is strongly related to small farms. Almost three-fourths of the small farms are full owners, whereas less than half of the large farms are full owners. The average farm size in 2002 was 441 acres and the median size was 120 acres. Further, just over one-fourth of the land is owned by those farming 10 to 49 acres (Figure 17). This is not surprising given the large number of farms in the low sales categories.

**Government Programs**

Government programs and payments constitute an increasingly large portion of farm income. Figure 18 shows the distribution of farms receiving government payments and the total payments by sales class. The distribution shown in Figure 18 is influenced by several factors. One factor is that only a third of U.S. farms actually received any direct government payments in 2002. The middle sales category had the highest percentage of farms receiving government payments. For the farms with sales from $50,000 to $499,999, 62 percent received government payments. Another factor for this distribution is that many of the very large farms are fruit and vegetable farms. Direct government payments are not available for these commodities.

Figure 19 shows the level of direct government payments to U.S. farms based on data from the USDA’s Economic Research Service. Notice that there was a tremendous rise in those payments in the mid-1980s. The payment levels have varied since that time but they still remain at a relatively high level. The level of government payments changes from year-to-year depending upon the yields and prices. There are also changes due to the different features of each farm bill. The 1985 Farm Bill is noted for its major changes in farm policy. These changes
included the conservation reserve program and other features that enhanced the level of payments. This major shift is clearly evident in Figure 19.

Figure 20 shows the government payments as a percent of net farm income. This figure shows the change in government involvement in agriculture, especially with respect to income. It can be argued that there is a cost associated with being in the programs so that the percentage in Figure 20 is not entirely accurate. This was especially true prior to the 1996 Farm Bill. However, since that time there have not been any set-aside acres so the cost of involvement in the programs is modest relative to the benefits.

The government programs exert distributional impacts as well. Figure 21 shows the distribution of farms that are in the Conservation Reserve Program (CRP) or Wetland Reserve Program (WRP), both by sales and economic class. The sales classification is based only on sales and the economic classification is based on sales plus the government payments.

Figure 22 presents the impact of including government payments on the distribution of the acres in CRP/WRP. Similar to Figure 21, when the division is based on the sales class, the majority of the acres are in the smallest class.

**Income and Expenses**

Figure 23 shows the change in the total value of agricultural production, total expenses and net farm income over the past 54 years using data from the USDA/Economic Research Service. Notice that as the value of production has increased, so has the level of total expenses. The result is that net farm income has followed a relatively flat trend line over the past few decades.

Figure 24 presents the same information as Figure 23 but the dollars have been deflated to a constant dollar with 1982 to 1984 as the base. A slightly different picture emerges when real
rather than nominal dollars are used. Figure 24 shows that the value of output, expenses, and net farm income increased through the mid- to late 1970s, but then decreased and have been relatively flat ever since.

Figures 23 and 24 show the major change that occurred in agriculture during the 1970s and 1980s. In the 1970s agricultural land values soared. So too did the prices for agricultural commodities. There were at least two major reasons for this dramatic increase. First, there was serious inflation throughout the whole economy. The oil embargo and other factors pushed prices higher. The second reason for the changes in agriculture was the rapid opening and increasing of world trade and exports. There was the Russian wheat deal, the opening of relations with China and other events that all occurred during the early to mid-1970s. These factors reversed themselves in the early 1980s as is shown in Figure 25.

These two figures show that in spite of increasing output, expenses also have risen. This is illustrated in Figure 25 which shows that in the 1950s net income was approximately 35 percent of sales. In other words, farmers received about $35 of income for every $100 of sales. Over the past decade net income as a percent of gross has averaged closer to 20 percent. This means a farm would need approximately $100 of sales to generate $20 of income. Figure 25 helps explain one of the reasons we have seen the expansion in farm size; namely farms have to be bigger in order to generate the same level of income they did in the past.

Regional Comparisons

Agriculture in the United States varies widely from region to region and even within regions. This section discusses some of the major differences found on a state and regional basis. We examined 14 different states in various areas of the United States. Among them were: Northeast (Vermont, Pennsylvania, New York), Southeast (Georgia, North Carolina, Florida),
Midwest (Michigan, Wisconsin, Iowa), Great Plains (Nebraska, Kansas, Texas, North Dakota), and California.

**Sales and Economic Class**

Every state followed a pattern similar to the country as a whole with small farms predominating. There were very little differences when measuring size based on sales or economic class. The Midwestern states were the only ones with any discernable difference for the small farm category. The other states displayed relatively little difference between the two classification systems regardless of the size. This shows that the government payments are not as important in these areas, relatively, as they are in other states or regions in the country.

**Percent Change in Farm Numbers and Sales**

The percent change in the number of farms and sales varied somewhat by state. All of the states, and the country as a whole showed a decrease in the middle-sized farms. Five of the 14 states showed a decrease in the small size farms as well as the middle-sized farms. In four of the 14 states there was an increase in the small and large-sized farms. Two of the states showed a decrease in all the categories and the remaining three states showed an increase in the small but not the other two categories.

The variations in patterns with respect to increases or decreases in the small and large categories is due in large part to small numbers of farms in the category. The one common element, regardless of the state or region was that the middle-sized farms decreased in numbers. The percentage change in the sales attributed to each sales category was similar across all states and regions. The small and middle-sized categories decreased sales while the large category increased.

**Percent of Sales and Land**
The largest sales category had the highest percentage of sales for most states. The notable exceptions were: Wisconsin, North Dakota, Vermont, and Iowa. In these states, the middle size category had the greatest percentage of sales. The pattern of land control by sales class varied somewhat throughout the United States. However, most states had a pattern similar to Figure 4. California and Florida had the highest percentage of land in the highest sales category. The Northeastern states, New York, Pennsylvania, and Vermont, as well as Texas and Georgia showed more land was controlled by the smallest sales categories. Nebraska and Iowa have more farms in the middle-sized category than the other states. These two states have almost 40 percent of their farms in the middle-sized category.

**Direct and Organic Sales**

Most states showed proportions of direct sales and/or organic farms and sales almost identical to the country as a whole. There were, however, a few notable exceptions. States in the Northeast (New York, Pennsylvania and Vermont) showed a considerably higher percentage of farms reporting direct sales. Over 10 percent of the farms in both the smallest and middle sales categories reported direct sales. In California almost 10 percent of the smallest sales category farms reported direct sales. And, in Michigan approximately nine percent of both the small and medium-sized sales categories reported direct sales.

The distribution of farms and sales within a sales class is harder to determine at the state level, especially for organic categories. The Census will not report information that has the potential of disclosing the individual farm or even approximating whose farm it might be. Because organic and, to a lesser extent, direct sales, farms and sales are a small portion of total sales for many states, the information reported at the state level is somewhat incomplete. For the
most part, however, the individual states followed the pattern established for the entire United States. Most of the organic and direct sales farms fall in the small size category.

The highest percentage of organic sales tends to be concentrated in the larger size sales groups, in spite of these groups having a lower percentage of the farms. This is one of the issues that occur when dividing by sales; the highest percentage of sales will occur in the higher sales class simply by definition. In the case of organic sales, however, there is an inordinate percentage in the very large sales category. For the United States as a whole, 51 percent of the organic sales were in the largest sale category. In California, almost 70 percent of the organic sales were in the largest sales category. Georgia also showed an irregular pattern, with almost 70 percent of the sales occurring in the $50,000 to $500,000 sales category.

**Income Patterns**

All of the states exhibited a decline in the net income as a percent of gross income category over the 1950 through 2003 period. Nearly all of them started the period in the 30 to 40 percent range and ended the period in the 15 to 20 percent range. North Carolina, while exhibiting the same general decline as the other states, did begin the 1950 to 1960 period at a considerably higher level. Today they are in the same range as the other states but have fallen much further.

**Government Programs**

Government programs exert tremendous influence on farm income in the United States. This influence takes several forms and shows definite regional patterns. The distribution of farms receiving government payments and the distribution of those payments show a relatively consistent pattern across the states. There are a large percentage of the farms receiving payments
in the very smallest category and the largest percentages of payments are going to the farms in the middle category.

There are a few exceptions to this pattern. In California the percentage of payments going to the largest farms is nearly four times the national average, with almost 60 percent of the payments going to this group. In Vermont and to a lesser extent Nebraska and California there are more farms in the middle sales category when compared to the national average.

In part the distributional differences can be attributed to the relative importance of the government programs. It is important to remember that the government program payments only include the direct payments. They do not include benefits that would accrue through programs such as market orders or allotments.

The impact of the government programs, as measured by the government payments as a percent of net farm income, shows very distinct regional patterns. In California, the Southeast states (Florida, Georgia, North Carolina), and the Northeast states (Pennsylvania, New York, and Vermont), the percent of income coming from the government is much lower than in the other states. The percent of income coming from the government also has been much more constant over time. For example, since 1949 the percent of net farm income received from the government by California and Florida farmers has averaged under or just slightly above 10 percent for the entire period. In contrast, the Midwest and Great Plains states have averaged well over 70 percent in some years.

These results are not surprising given the nature of the farm bill payments and the different agriculture found in different regions of the country. Some regions, such as the Midwest and Great Plains, rely much more heavily on the commodity crops than other areas.
California and Florida have a more diverse agriculture including fruits and vegetables which do not receive direct government payments.

As a result of the changes in the 2002 Farm Bill, most of the states showed a decrease in government support in 2002. There was a regional exception, however. The states in the Northeast actually showed a fairly significant increase in the percent of the net farm income coming from the government.

Conclusion

The 2002 Census reveals the changing status of the farms and ranches in the middle. These farms once comprised the majority of farms and ranches but today they are the segment showing the most rapid decline. The United States continues to move rapidly to a farming structure dominated by a large number of very small farms and a relatively few large farms.

U.S. government farm programs exert considerable influence on agriculture today. Since 1980 these government program payments have average 28 percent of net farm income. Yet, in spite of this, and the fact that farms with sales between $50,000 and $500,000 received the most government payments, we are still seeing farms in the middle sales class disappear the fastest.

The farms in the middle control almost half of the land in the U.S. As they leave the business, important questions arise regarding who will farm the land and how it will be farmed.

Farms today face tight margins and struggle to make an adequate income. There are different approaches that can be used to try and generate an adequate income. One approach is to get big. This way tries to live with the tight margins by increasing volume. Another approach is to differentiate your product. Organic agriculture is one example of product differentiation. As organic agriculture has become more popular with consumers we are increasingly seeing the structure for organic agriculture mimic the structure that exists for most of agriculture.
Moving closer to the consumer is another way to live with tight margins. By cutting out the middle man the farmer is able to retain a greater amount of the income. The middle-sized farms appear to be the group taking the most advantage of this approach.

Examining the 2002 Census of Agriculture data reveals several things about the farms in the middle. They are disappearing and their disappearance will change the face of the rural countryside. If the government program payments are intended to maintain this group of farmers then they have failed. Alternative approaches need to be considered.

The results of the 2002 Census leave policymakers with a conundrum. Should policies be geared toward the greatest number of people or greatest level of production? What policies will be the most effective and for what goals? If land use is the issue, then it appears that the middle-sized farms, those with sales between $50,000 and $500,000, should be the target. However, if the greatest number of people is the target, then programs should be geared toward the very small farms. But, if production is the key issue, then targeting only the very large farms would be the most effective. Trying to create and administer a policy geared toward all farming levels will not succeed because of the vast differences between the farms.

The process of compiling the data for the 2002 Census was changed to more accurately reflect the number of small farms and proved to be very successful in capturing information from more of these farms. Unfortunately, at the same time that more of these farms were being enumerated, their inclusion in the data set masked much of what was happening in farming. The reported drop in farm numbers would have been almost four times as great had the very small farms been excluded.
Policymakers need to have adequate information if they are to make the best policy decisions. People need to be aware of what is happening in agriculture. Only with an adequate Census and realistic summaries will that information be available.
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Figure 2: Percent Change in US Farms and Sales by Sales Class, 1997 to 2002
Figure 3: Percent US Farms and Sales by Sales Class 2002
Figure 4: Percent of US Farms and Land by Sales Class, 2002
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Figure 7: Percent of US Farms Based on the Number of Operators

- 60% for 1 operator
- 30% for 2 operators
- 5% for 3 operators
- 1% for 4 operators
- Less than 1% for 5 or more operators

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- Male
- Female
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