

## TREND EXTRAPOLATION

This chapter describes the projections obtained from simple extrapolations of trends, and the adjustment of the census data to take account of overenumeration and underenumeration. Again, the central question is: If we assume that the current trends are going to continue into the future, what will the structure of agriculture likely be by the year 2000?

### Technical Overview

The functional specification for projecting the number of farms in each acre size and sales class was selected on the basis of the  $R^2$  (coefficient of determination) goodness-of-fit criterion, consistency, reasonableness in comparison to the past trend, and, to some degree, our own subjective judgment. To illustrate, a linear trend equation was rejected because: (1) the linear specification frequently projected a much faster rate of decline in farm numbers than one would normally expect. In fact, a linear equation will project the number of farms in the 100-219 acres class to completely disappear by the late 1990's and to be negative in the year 2000; and (2) this form did not generally yield a higher  $R^2$  than a semilog specification, the form eventually selected. Conversely, a polynomial specification was rejected for the opposite reason--it frequently projected trend reversal. Instead of a decline in the number of farms in the 1-to-99-acre size class, it projected an increasing trend into the future.

This left a choice between the log-linear and the semilog forms. The semilog form was chosen because it generally gave a better fit in terms of the  $R^2$  criterion, and it produced expected results better than the log-linear form. For example, the number of farms in the 1-to-99-acre size group historically had declined at a high rate--311,000 farms between 1959 and 1964 and 133,000 between 1969 and 1974. If this trend continues, one would reasonably expect the number of farms in this size group to decline from the 1.36 million in 1974 to about 1.2 million in 1980. Yet, the log-linear specification would project virtually no decline. For similar reasons, we chose the semilog form to project the number for sales classes of less than \$20,000, and the log-linear form for sales classes of more than \$20,000.

### Data Adjustments

The data used throughout this study came primarily from the 1974 Census of Agriculture and earlier censuses; data from other sources are specifically noted. Because of incomplete counting in the census and the importance of capturing the effects of changes in commodity prices on shifts in farm numbers from one sales class to a higher one, adjustments were made to the data used in this study to account for underenumeration and overcounting, and for the effects of price inflation. No adjustments were made to the data for trend projections because the effects of price inflation were assumed to be captured in the trend equations. However, this adjustment was explicitly made for the Markov process and age cohort projections discussed subsequently.