sales, yielding a 94-percent error for 1974 sales projections (table 38). 17/ This procedure proved equally unsatisfactory to project farm numbers based on acreage, yielding errors of 68 percent (table 39). Those results suggest that considerable discrepancies still exist between the actual and estimated distribution functions obtained by the negative exponential function. As shown in table 38, there are significant underestimates in the smaller size classes and overestimates in the medium and larger classes. Also, this function overestimates the numbers of farms with sales between $10,000 and $500,000 by factors ranging from 1.5 to 4.5, and underestimates the number of farms with sales less than $10,000.

Markov chain analysis, modified somewhat in this study to adjust for the effects of price inflation on changes in farm numbers, appears to be promising. The errors of projection, by both acreage and sales, in 1974 were about 4 and 0.1 percent (tables 40 and 41). In contrast to previous applications, there are no gross estimation errors evidenced in these projections. It is essential to capture the effects of price inflation in an era of price instability to avoid gross distrotions and inaccuracies in projections of farm numbers by sales.

In addition, those results suggest that the underlying assumption of the Markov process on the growth of farms is questionable. Instead of a farm's growing from the smallest to the largest size, the census data suggest that the largest farms tend to come from smaller farms of a minimum viable size, and not from the smallest size classes.

Age cohort projections tend to be similar to those from the Markov process. Compared with 1969 actual farm numbers by both acreage and sales, age cohort analysis yielded a 10.9-percent and a 16-percent error according to the Theil-U coefficient (tables 42 and 43). 18/ Age cohort analysis appears to underestimate farms with $2,500 to $4,999 sales and to overestimate those with $20,000 to $39,999 sales.

17/ The percentage error is derived from comparing actual proportions of 1974 farm numbers by size class with projected percentages. In this way, the comparison is not complicated by projections on land in farms and acreage farm size.

18/ In projecting the 1969 number of farms by acreage, the cohort ratios constructed from the 1950-59 period were multiplied by the age-size distributions in 1959. For sales, a 1959-69 cohort-ratio matrix was multiplied by the 1964 age-size matrix to project the 1974 farm numbers by sales class. This procedure overlapped 5 years of calculation of the age cohort ratios and the projection period. This was necessary because different sales class intervals were published by the Bureau of the Census before 1959.