

In more general terms:

$$\log y = B_0 + B_1 x \quad (3)$$

where  $B_0 = \log y_0$  and  $B_1 = -B \log e$ .

The estimated function was forced through the point representing 100 percent of the farms and the smallest fractional size (that is, restricting 100 percent of the farms to lie above the lower limits of the smallest category). Using the logarithmic transformation (base 10) of the data, this is the point with coordinates  $(x_1/\bar{x}, 2.0)$ , where  $x_1$  is the lower limit of the smallest size category and  $\bar{x}$  is the average farm size. This follows, noting that from:

$$\log y = B_0 + B_1 x$$

$\log y = 2.0$  when  $x = x_1/\bar{x} = x^0$ . That is,

$$2.0 = B_0 + B_1 x^0$$

$$B_0 = 2.0 - B_1 x^0$$

$$\begin{aligned}\log y &= (2.0 - B_1 x^0) + B_1 x \\ &= 2.0 + B_1 (x - x^0)\end{aligned}$$

The last expression is equivalent to  $(\log y - 2.0) = B_1(x - x^0)$ , which indicates operations performed on the data prior to estimation. The value of the constant term for the estimated equation is calculated according to the relationship

$$B_0 = 2.0 - B_1 x^0$$

This is not a severe restriction and simply results in the estimated distribution reflecting that all farms are 1 acre or larger in size.

Census of Agriculture data (without adjustment for underenumeration) for the years of 1959, 1964, 1969, and 1974 showing farm numbers by acreage categories were used to estimate distribution functions (as described by equation 3 above) for the United States, nine geographic regions, and each of the 50 States.<sup>6/</sup> The equations, estimated by ordinary least squares, for the four census periods and for the periods combined, with related statistics, are shown in table 17 for the United States and the nine regions.

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6/ The States in each region were as follows:

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut

Middle Atlantic: New York, New Jersey, Pennsylvania

East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin

West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

South Atlantic: Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida

East South Central: Kentucky, Tennessee, Alabama, Mississippi

West South Central: Arkansas, Louisiana, Oklahoma, Texas

Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada

Pacific: Washington, Oregon, California, Alaska, Hawaii