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Evaluating the Oklahoma Tax Assessors List for Use in Crop Surveys

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INTRODUCTION

The objective of this study was to determine if a tax assessor's list, without data related to land area or crop acreages, could be successfully stratified for making crop sample surveys. The study tested correlations between sample survey data variables and control data variables from the tax assessor's list in order to evaluate the effectiveness of control items as stratification variables. In addition, correlations were computed on livestock data variables which are included in both the sample data and the tax list. These correlations provided an indication of changes that occur in identical variables through time.

The sample data was obtained from the General Farm Inquiry Survey conducted in July, 1969. The survey provided information on total acreage in the farm, crop acreages, livestock inventories, wages paid to workers and the number of workers hired. The Oklahoma Tax Assessments List for Payne County was used as the sample frame and provided the control data. The tax list was compiled in the spring of 1968. The tax list data included livestock inventory totals, number of tractors, value of tractors, and total value of all farm machinery.

SUMMARY

It appeared there was sufficient information on the tax list to provide an indication of the general type of farming operation. However, the correlations obtained between survey data and tax list data indicate rather conclusively this is not the case. Many of the correlations are statistically significant from zero, but are not sufficiently large enough to make the variables tested efficient stratification variables. Most of the correlations are in the range of .200 to .440 and only occasionally are they as high as .400.

The livestock categories are the only ones which appear on both the tax list and the survey. The correlations obtained between two lists for total cattle ($r = .359$) and hogs ($r = .240$) are low. These low correlations indicate that the tax list characteristics changed considerably since it was compiled. There is also the possibility that the respondent reported incorrectly to the tax assessor, the survey, or both. The correlation for sheep is high ($r = .917$), but there were very few sheep reported

in the sample (207 out of 211 sample farms reported no sheep on both lists). The tax list items which correlated best with total acreage are total value of all farm machinery (r = .392) and total cattle (r = .421). When total acreage from the survey was correlated with the total cattle from the survey, a correlation of .793 was obtained. Thus, the data on total cattle from the tax list might be a useful indicator of total acreage for this region if the cattle numbers on the tax list are up-to-date and accurate. For cultivated acreage the highest correlation obtained (r = .413) was with total value of all farm machinery. The correlations between the tax list items and the two labor items are low. In general, the correlations with wages are higher than those with workers, which are the lowest of all.

With these low correlations, the application of the tax list items as stratification variables in crop surveys is questionable.

THE SURVEY

The control data was obtained from information on the 1968 Oklahoma Tax Assessments List for Payne County. Acquired for use in the Multiple Frame Research Project in Oklahoma, this list is based primarily on the operator's personal property tax records. Besides a listing of the operator, spouse's name, and a complete address, the tax list provides the following information for each farm:

Livestock

1. Total number of cattle
2. Number of stock cows
3. Number of dairy cows
4. Number of hogs and pigs
5. Number of sheep and lambs

Tractors and Machinery

1. Number of tractors
2. Value of tractors
3. Value of other farm machinery
4. Total value of all tractors and farm machinery

The sample data were collected from a random sample of 211 respondents in Payne County, Oklahoma. The questionnaire was a general

farm inquiry. It was designed by the Research and Development Branch, the Methods Staff, and the Data Collection Branch. The data were collected by the Oklahoma SSO in July, 1969. The survey acquired the following sample data for each farm:

Acreage

1. Total acreage
2. Cultivated acreage

Livestock

1. Number of milk cows
2. Number of non-milk cows
3. Number of all other cattle
4. Number of hogs and pigs
5. Number of sheep and lambs

Labor

1. Total wages paid to all agricultural workers for the entire year 1968
2. Largest number of hired workers used at any one time in the quarter of 1968 during which the largest amount of wages to agricultural workers was paid

For analysis, the three cattle items for each farm were added together to form one item of total cattle. The two labor items are referred to as wages and number of hired workers respectively in this report.

ANALYSIS

There were six sets of data from the tax list and seven sets of data from the sample survey used for analysis.

Tax List

1. Number of tractors
2. Value of tractors
3. Total value of all farm machinery
4. Total number of cattle
5. Number of hogs
6. Number of sheep

Sample Survey

1. Total acreage
2. Cultivated acreage
3. Total number of cattle
4. Number of hogs
5. Number of sheep
6. Wages
7. Number of hired workers

For a sample of over 200, a correlation of .181 is significant at the .01 level. The livestock categories are the only data that appear on both the tax list and the survey. Since the tax list was compiled during the spring of 1968 and the survey was conducted during July, 1968, there was a time difference of more than one year.

Table 1.--Correlations between livestock items on tax list and sample survey.

Survey item	Tax list item	r
Total cattle	Total cattle	.359
Hogs	Hogs	.241
Sheep	Sheep	.917

The correlations between the livestock items are given in Table 1 above. The correlations for total cattle and hogs are significant but low. These low correlations might have been the result of change in the number of cattle and hogs on the sample farms during this time. Another factor might have been incorrect reporting by the farmer for either the tax assessor's list, the survey, or both. In the case of sheep, the correlation is high (r = .917). However, of the 211 sample farms, only four farms on the tax list had reported sheep and only three farms reported sheep in the survey.

Table 2.--Correlations between total acreage from the survey and the tax list items.

Survey sample item	Tax list control items	r
Total acres	Number of tractors	.241
Total acres	Value of tractors	.382
Total acres	Total value of farm machinery	.392
Total acres	Total cattle	.421
Total acres	Hogs	.287
Total acres	Sheep	.019

Five out of six of the control items correlate significantly with total acreage (see Table 2). The highest correlations are with total value of farm machinery ($r = .392$) and total cattle ($r = .421$). The sheep correlation is especially low because of the 207 out of the 211 farms with a zero entry for sheep.

A correlation coefficient was also computed for total acreage versus total cattle from the survey. It was calculated to be .793, creating the possibility that in this area the total cattle data from the tax list could be an indication of total acreage if it were used closer to the date of the tax list compilation.

Table 3.--Correlations between cultivated acreage from the survey and the tax list items.

Survey sample item	Tax list control items	r
Cultivated acres	Number of tractors	.276
Cultivated acres	Value of tractors	.382
Cultivated acres	Total value of farm machinery	.413
Cultivated acres	Total cattle	.234
Cultivated acres	Hogs	.054
Cultivated acres	Sheep	.078

Four out of six of the control items correlate significantly with cultivated acreage (see Table 3). The highest correlation (r = .413) is with total value of all farm machinery.

Table 4.--Correlations between the wage item from the survey and the tax list items.

Survey sample item	Tax list control items	r
Wages	Number of tractors	.223
Wages	Value of tractors	.374
Wages	Total value of farm machinery	.365
Wages	Total cattle	.261
Wages	Hogs	-.047
Wages	Sheep	-.018

Table 5.--Correlations between the workers item from the survey and the tax list items.

Survey sample item	Tax list control items	r
Workers	Number of tractors	.102
Workers	Value of tractors	.182
Workers	Total value of farm machinery	.230
Workers	Total cattle	.277
Workers	Hogs	-.049
Workers	Sheep	.062

The correlations between the two labor items and the control items are also low (see Tables 4 and 5). The correlations between the control items and wages are consistently higher than those between the control items and workers. The highest correlations involving total labor wages are approximately .37 with both value of tractors and total value of all farm machinery. The set of correlations involving workers and the control data is the lowest set of all; none is above .277.

CONCLUSION

It appears that none of the control data from the tax assessor's list are highly correlated with the crop variables usually considered for stratification for crop surveys. Although many of the correlations are statistically significant, none is above .440. The three machinery items correlate about equally with the sample items, with total value of all farm machinery being the highest in most cases. The livestock data on the tax list also do not correlate highly with the sample items. However, a .793 correlation was obtained between total acreage from the survey and total cattle from the survey. Thus, it may be possible that total cattle on the tax list might be a useful indication of total acreage.

There is a possibility that the time between compilation of the tax list and the sample survey period may have decreased some of the correlations. However, it seems unlikely that cultivated acreage, number of tractors, or value of farm machinery owned would change as much or as quickly as the livestock totals. The correlations might also have been affected by an incorrect report from the farmers to the tax assessor, the survey, or both.

This study showed no positive indications of high correlations between tax assessor's lists and sample survey data for crop surveys. If a tax list were the only list available for sampling for a crop survey, then the most important items for stratification would be value of tractors, total value of farm machinery, and total cattle. These items consistently obtained the highest correlations with the sample survey items.