ENUMERATION COSTS OF LAND MARKET SURVEYS,

OKLAHOMA, 1941-1952

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# CHAPTER I

## INTRODUCTION

Research dealing with farm land market situations and fluctuations is as much a service to agriculture as are crop outlook estimates, weather predictions, and government livestock reports. This function of making estimates of farm land values and transfers available to farmers is performed by various experiment stations, government agencies, and private institutions and, as with other studies of agricultural conditions, estimations of the farm land market situation should be reliable, up-to-date, and applicable to specific areas. This involves gathering sufficient data, processing and analyzing the data, and making the results available to the public while the estimations are still descriptive of current conditions.

Due to the nature of the farm land market, research dealing with the estimation of land values and transfers is more complex than many other types of agricultural situation reports. Land values exhibit extremely wide variations between counties, between townships, and even between individual farms; and the lack of a standard measure of land values plus the presence of growing crops, buildings, and other improvements complicates the measurement of farm land values. It is for these reasons that researchers have been hesitant about using less than a complete enumeration of all land transfers occurring within an area as a basis for making estimations of the farm land market situation.

## Purpose

This study is a progressional phase of a land market sampling study inaugurated at Oklahoma A. and M. College in 1949. The previous phases to the present study consisted of developing and testing sampling techniques for estimating average land prices and number of transfers.[1] Using the monthly fifteen-day sampling technique developed in the earlier phases as a basis for estimating land prices and number of transfers, the present study presents information on the comparative costs of half-year, one-year, two-year, three-year, and four-year, sample and non-sample enumerations of land prices and transfers by four, six, and eight county surveys. This information is developed for the purpose of offering specific evidence of costs of various sizes of sample and non-sample enumerations and to further provide a break-down of the various types of surveys which may be selected from different sized budgets or from a given budget.

The study also discusses two related aspects of farm land market research which are designed to test refinements to existing techniques for the purpose of achieving improved performance. The first phase is

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[1] C. Curtis Cable, Jr., Land Market Sample Study in Choctaw, Payne, Jackson, and Grady Counties, Oklahoma, 1941-1949, Department of Agricultural Economics, Oklahoma A. and M. College, Unpublished thesis for the degree of Master of Science, 1949; Jeppe Kristensen, Reliability of Land Market Sampling Techniques, Payne and Grady Counties, Oklahoma, 1941-1949, Department of Agricultural Economics, Oklahoma A. and M. College, Unpublished thesis for the degree of Master of Science, 1951; and Robert L. Tontz, Jeppe Kristensen, and C. Curtis Cable, Jr., "Reliability of Deed Samples as Indicators of Land Market Activity." Land Economics, February, 1954.

a comparison of land values and transfers based on date of sale compared with land values and transfers based on date of recording to determine if there is any significant difference between the two which might affect the reliability of the sample. The second preliminary aspect deals with the reliability of selected formulae for estimating considerations based on federal revenue stamps. This phase is an attempt to determine which of three formulae is most accurate and desirable.

## Procedure

Before attempting any judgments concerning the comparative costs of sample and non-sample enumerations it is necessary to study the two preliminary aspects enumerated previously in order to gain a better perspective of the over-all value of the sample. Each of these preliminary phases constitutes a separate and distinct study within itself and therefore separate procedures must be outlined for each.

In order to determine whether any significant difference exists between estimations of land values and transfers based upon the date of sale as compared with estimations based upon the date of recording, transfer data for Payne and Grady counties for the years 1946, 1947, and 1948 are summarized on the basis of complete enumerations based on date of sale, complete enumerations based on date of recording, and fifteen-day samples based on date of recording for quarterly, semi-annual, and yearly surveys. The differences between these estimations are then used as a guide to show if any significant deviations exist.

The reliability of selected formulae in estimating cash considerations from federal revenue stamps is judged by making estimations of

cash considerations on the basis of three different formulae and comparing these estimations with transfers which have the actual cash consideration and the amount of federal stamps shown. The data used are transfers which show both cash consideration and the amount of federal revenue stamps in Payne, Choctaw, Grady, and Jackson counties for the years 1941 through 1952. The three formulae investigated are: (1) assign the last $.55 revenue stamp a value equal to its mid-value, (2) assign the last $.55 revenue stamp a value equal to its full value of $500, and (3) value the last $.55 revenue stamp at $350 for transfers showing revenues of $.55 to $2.20, $400 for revenues between $2.75 and $7.15, and $450 for revenues of $7.70 and more.

The process of determining the comparative costs of the fifteen-day sample consists basically of computing the actual time and cost required to collect sample data and the actual time and cost required to collect enumeration data and noting the amount of the sample savings. Comparisons are made for four, six, and eight county surveys covering time intervals of three months, six months, one, two, three, and four years. The estimations of the time and cost requirements for collecting data attempt to duplicate as closely as possible the actual amount of time and expenses required for land market studies in Oklahoma.

### Source of Data

The data included in this study were taken partly from deed records of various county clerks and partly from the three previous studies of the

reliability of sampling techniques.[2]  As each of the three main chapters is practically a separate study within itself, the number of years and number of counties discussed in each chapter differ.  Data on land values and transfers from the following years and counties of Oklahoma were included within the designated chapters:

Chapter II.  Land Values and Transfers Based on Date of Sale Compared With Land Values and Transfers Based on Date of Recording

| Counties | Years |
|---|---|
| Payne | 1946 to 1948 |
| Grady | 1946 to 1948 |

Chapter III.  Reliability of Selected Formulae in Estimating Cash Considerations from Federal Revenue Stamps

| Counties | Years |
|---|---|
| Payne | 1941 to 1952 |
| Choctaw | 1941 to 1952 |
| Grady | 1941 to 1952 |
| Jackson | 1941 to 1952 |

Chapter IV.  Comparative Costs of Sample and Non-Sample Enumerations of Land Prices and Transfers

| Counties | Years |
|---|---|
| Payne | 1949 to 1952 |
| Choctaw | 1949 to 1952 |
| Grady | 1949 to 1952 |
| Jackson | 1949 to 1952 |
| Texas | 1949 to 1952 |
| Delaware | 1952 |
| Latimer | 1952 |
| Garfield | 1952 |

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[2]Ibid.

These data on land values and transfers represent bona fide voluntary transfers of actual farm land taking place within the indicated time interval. In order to eliminate suburban residences and small tracts not used for agricultural purposes, transfers of less than ten acres were not included. Sheriffs' sales, estate settlements, quit-claim deeds, and transfers between relatives wherein the consideration was questionable were also eliminated.

Part of these data were collected by hired clerical workers in the local counties and part by enumerators from the Department of Agricultural Economics, Oklahoma A. and M. College. The data were transcribed from the deed records onto summary cards similar to the one shown in Figure 1. The information recorded included the name of seller, name of buyer, legal description of the land, date of sale, date recorded, amount of federal revenue stamps, total consideration, percent of mineral rights owned and reserved, mortgage balance, and volume and page of the instrument in the county record books. As each chapter utilizes these data for different purposes, the methods and techniques employed in summarizing and analyzing the data are discussed within each section as each specific problem is encountered.

Review of Literature

A comprehensive review of literature pertaining to farm land market studies was made by Cable in 1949 and was summarized and added to by Kristensen in 1951.[3] This review of literature is restricted to sampling

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[3]Cable, op. cit., pp. 12-26, and Kristensen, op. cit., pp. 9-17.

OKLAHOMA FARM LAND MARKET SURVEY

Date of Sale_____                          County_____
Date Recorded_____                         Vol._____ Page_____
                                                   Kind of Deed_____

Buyer _____      Address_____
Seller_____      Address_____

| Description | :Sec.: | Two. | :Rg. | :Acres |
|---|---|---|---|---|
| | : | : | : | : |
| | : | : | : | : |
| | : | : | : | : |
| | : | : | : | : |
| | : | : | : | : |
| Total Acres | XX | XX | XX | |

Consideration
  Total Consideration          $_____
  Amt. of Federal Stamps        $_____
  Cash Paid                     $_____
  Mortgage Balance              $_____
    Interest Rate__% Terms:    _____
  Date Final Payment Due        _____
Type of Mortgage:
  Seller as mortgagee ☐  Other new mrtg. ☐
  Mortgage assumed    ☐  Combination     ☐
Names of Mortgagees, New or Assumed: Amount
  _____  $_____
  _____  $_____
Mrtg. Book_____ Page_____

Percent of mineral rights owned by
  seller at time of sale: _____
Mineral rights reserved by seller:
  None           ☐
  All            ☐ Number of years___
  Fractional part ☐ Number of years___
    of whole mineral estate.
    Amount ($\frac{1}{2}$, $\frac{1}{4}$, etc.) _____

Are chattels included? ☐ No, ☐ Yes.
  Estimated value $_____
If undivided interest only, show fraction___

Remarks: _____

**Figure 1.  Summary Card on Which Data Were Recorded for Each Individual
Bona Fide Transfer of Farm Real Estate**

studies of land market activity undertaken since 1949.

Cable made a study in Oklahoma in 1949 to determine if a sample of the transfers made within a fractional part of a month would serve as a reliable indicator of land values and transfers.[4] Using a standard of reliability requiring 70 percent of the land values and transfers to fall within a range of 90 to 110 percent of the actual land values and transfers, he found that a sample of the first fifteen days of each month was reliable for surveys covering a time interval of one year. A sample of the first twenty days was reliable for a survey convering six months, and a sample of the first twenty-five days was reliable for a three-month survey.

In 1951 Kristensen made a follow-up study of Cable's work.[5] Kristensen's study--based on "business" days--tested five-, ten-, and fifteen-day semi-annual samples of land values and transfers from two Oklahoma counties for the years 1941 to 1949. Using chi-square and regression coefficient tests he found that the ten-day and fifteen-day samples did not deviate significantly from the semi-annual data. However, in expressing the sample data as percentages of the semi-annual data to determine how much a sample could vary from the actual data without being statistically significant, it was found that wide ranges were necessary to include all samples. Only the fifteen-day samples of values per acre came sufficiently close to the semi-annual data to be recommended for future studies.

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[4]Cable, op. cit., pp. 1-77.
[5]Kristensen, op. cit., pp. 1-99

The previous two studies formed the basis of a further analysis by Tontz, Kristensen, and Cable which concluded that only the fifteen-day sample on a yearly basis should be considered as a possible substitute for the non-sample approach in estimating land prices and transfers.[6] If only land price estimates were desired, however, it was concluded that a semi-annual fifteen-day sample might be satisfactory.[7]

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[6]Tontz, Kristensen, and Cable, op. cit., p. 51.
[7]Ibid.

# CHAPTER II

## LAND VALUES AND TRANSFERS BASED ON DATE OF SALE COMPARED WITH LAND VALUES AND TRANSFERS BASED ON DATE OF RECORDING

This chapter presents the results of tests designed to show whether any significant difference exists between the average price and number of transfers computed from complete enumerations based on date of sale and those based on date of recording. A comparison of each of the above is also made with the average price and number of transfers computed from fifteen-day sample studies based on date of recording to determine if the date of sale-date of recording differences exert any influence upon the reliability of the sample. The study covers quarterly, semi-annual, and annual surveys of Payne and Grady counties for the years 1946, 1947, and 1948.

It should be noted at this point that the fifteen-day sample is always based upon the date of recording, never on the date of sale.[1]

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[1]This becomes obvious with a clear understanding of the method of filing instruments and the method used to obtain the data for a fifteen-day sample. The instruments are filed in the books of the county records in the order of the time of their reception by the county clerk or deputy. Therefore, all instruments of similar types (deeds, mortgages, or leases) which are recorded on the same day are adjacent to one another. It is thus possible that two instruments which were executed (sold) on the same day but recorded on different days may be and often are separated by as many as several hundred pages in the county records. The enumerator, in securing deed data, searches or "thumbs through" the deed records until he finds a bona fide transfer of farm land. If the date of recording is the criterion setting the limits which the sample is to cover, the enumerator merely has to search the instruments which were filed in the first fifteen days of each month which are in consecutive order. If, however, the date of sale is the criterion, the enumerator must search through every instrument in the record book and, if such is the case, the saving in time brought about by utilization of the sample would be extremely small.

If the sample is based upon the date of recording, is it not then merely a sample of the transfers which are recorded within the specified period, and not a sample of the transfers actually occurring within the period? If the sample deviates slightly from the date of recording complete enumeration, will the sample error be magnified by the difference between complete enumeration date of recording and complete enumeration date of sale? The answer to the first question is obviously affirmative; an answer to the second question is one of the goals of this chapter.

It is found that the date of sale-date of recording differences do not exert any evident influence upon the sample reliability of average prices. For the reliability of the sample estimates of number of transfers, however, there exists a slight possibility that the reliability might be affected adversely by the large differences in number of transfers for quarterly and semi-annual date of sale and date of recording complete enumerations. It is found that all of the deviations decrease as the time interval covered in the survey increases; that is, the difference between the average price based on date of sale and average price based on date of recording is greater for a survey covering one-quarter of a year than for a survey covering a full year.

## Comparisons

An understanding of the comparisons which were made and the methods by which they were achieved is necessary for clear comprehension of the results which exist and the analyses and conclusions which follow. The figures in Table 1 show the average price per acre as computed from

Table 1. Average Price Per Acre as Computed Under Conditions of Complete Enumeration Based on Date of Sale, Complete Enumeration Based on Date of Recording, and Fifteen-Day Sample Based on Date of Recording, Payne and Grady Counties, Oklahoma, 1946-1948

| County: Type | | Price Per Acre | | | | | | |
|---|---|---|---|---|---|---|---|---|
| and : of | : | | | | | : | Semi-Annual | : Annual |
| Year :Estimate*: | : | 1st Qu. | 2nd Qu. | 3rd Qu. | 4th Qu. : | 1st Half | 2nd Half : | |
| | | | | | Dollars | | | |
| Payne, 1946 | | | | | | | | |
| C.E., D. of S. | | 37.77 | 33.19 | 39.26 | 37.25 | 35.63 | 38.42 | 37.15 |
| C.E., D. of R. | | 36.36 | 35.14 | 37.91 | 38.55 | 35.77 | 38.24 | 37.19 |
| Sam., D. of R. | | 38.17 | 40.00 | 39.32 | 40.70 | 38.94 | 39.98 | 39.59 |
| Grady, 1946 | | | | | | | | |
| C.E., D. of S. | | 42.77 | 44.20 | 38.35 | 40.79 | 43.32 | 39.53 | 41.53 |
| C.E., D. of R. | | 40.33 | 45.17 | 40.72 | 37.50 | 42.77 | 38.93 | 40.81 |
| Sam., D. of R. | | 40.79 | 40.04 | 37.11 | 40.73 | 40.46 | 39.34 | 39.87 |
| Payne, 1947 | | | | | | | | |
| C.E., D. of S. | | 31.31 | 30.45 | 39.12 | 33.92 | 30.87 | 36.59 | 33.73 |
| C.E., D. of R. | | 36.96 | 32.61 | 33.84 | 34.96 | 34.78 | 34.37 | 34.57 |
| Sam., D. of R. | | 40.24 | 33.56 | 36.44 | 38.36 | 37.06 | 37.20 | 37.12 |
| Grady, 1947 | | | | | | | | |
| C.E., D. of S. | | 41.70 | 36.51 | 37.69 | 36.65 | 40.19 | 37.19 | 38.49 |
| C.E., D. of R. | | 45.95 | 35.65 | 34.58 | 37.15 | 43.20 | 35.75 | 39.53 |
| Sam., D. of R. | | 44.41 | 37.30 | 31.13 | 37.03 | 42.10 | 33.96 | 37.84 |
| Payne, 1948 | | | | | | | | |
| C.E., D. of S. | | 32.92 | 30.88 | 40.79 | 45.47 | 31.98 | 43.33 | 37.52 |
| C.E., D. of R. | | 35.01 | 26.48 | 40.96 | 46.23 | 30.93 | 43.51 | 36.40 |
| Sam., D. of R. | | 32.07 | 36.06 | 50.10 | 42.95 | 33.46 | 46.15 | 38.39 |
| Grady, 1948 | | | | | | | | |
| C.E., D. of S. | | 41.17 | 47.91 | 63.13 | 50.57 | 44.16 | 56.88 | 52.27 |
| C.E., D. of R. | | 46.31 | 43.99 | 59.50 | 56.15 | 45.35 | 57.76 | 52.51 |
| Sam., D. of R. | | 49.23 | 43.03 | 66.37 | 40.95 | 46.67 | 53.03 | 50.05 |

*C.E., D. of S. refers to a complete enumeration based on date of sale; C.E., D. of R. refers to a complete enumeration based on date of recording; Sam., D. of R. refers to a fifteen-day sample based on date of recording.

Table 2.  Average Number of Transfers as Computed Under
Conditions of Complete Enumeration Based on Date of
Sale, Complete Enumeration Based on Date of
Recording, and Fifteen-Day Sample Based
on Date of Recording, Payne and Grady
Counties, Oklahoma, 1946-1948

| County and Year | Type of Estimate* | Number of Transfers | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Quarter | | | | Semi-Annual | | Annual |
| | | 1st Qu. | 2nd Qu. | 3rd Qu. | 4th Qu. | 1st Half | 2nd Half | |
| | | Number of Transfers | | | | | | |
| Payne, 1946 | | | | | | | | |
| | C.E., D. of S. | 93 | 66 | 107 | 75 | 159 | 182 | 341 |
| | C.E., D. of R. | 71 | 65 | 83 | 92 | 136 | 175 | 311 |
| | Sam., D. of R. | 72 | 55 | 101 | 96 | 128 | 197 | 324 |
| Grady, 1946 | | | | | | | | |
| | C.E., D. of S. | 111 | 83 | 91 | 96 | 194 | 187 | 381 |
| | C.E., D. of R. | 84 | 82 | 90 | 96 | 162 | 186 | 348 |
| | Sam., D. of R. | 89 | 80 | 91 | 103 | 169 | 194 | 363 |
| Payne, 1947 | | | | | | | | |
| | C.E., D. of S. | 58 | 62 | 59 | 63 | 120 | 122 | 242 |
| | C.E., D. of R. | 56 | 59 | 66 | 62 | 115 | 128 | 243 |
| | Sam., D. of R. | 71 | 65 | 67 | 46 | 136 | 112 | 248 |
| Grady, 1947 | | | | | | | | |
| | C.E., D. of S. | 64 | 35 | 61 | 66 | 99 | 127 | 226 |
| | C.E., D. of R. | 75 | 35 | 59 | 53 | 110 | 112 | 222 |
| | Sam., D. of R. | 74 | 41 | 58 | 66 | 116 | 124 | 240 |
| Payne, 1948 | | | | | | | | |
| | C.E., D. of S. | 53 | 36 | 33 | 39 | 89 | 72 | 161 |
| | C.E., D. of R. | 62 | 41 | 37 | 35 | 103 | 72 | 175 |
| | Sam., D. of R. | 71 | 36 | 29 | 29 | 108 | 58 | 166 |
| Grady, 1948 | | | | | | | | |
| | C.E., D. of S. | 56 | 45 | 75 | 80 | 101 | 155 | 256 |
| | C.E., D. of R. | 69 | 48 | 60 | 84 | 117 | 144 | 261 |
| | Sam., D. of R. | 83 | 55 | 57 | 84 | 139 | 142 | 281 |

*C.E., D. of S. refers to a complete enumeration based on date of sale;
 C.E., D. of R. refers to a complete enumeration based on date of
   recording;
 Sam., D. of R. refers to a fifteen-day sample based on date of
   recording.

Table 3. Average Deviations of Average Price and Number of Transfers,
Payne and Grady Counties, Oklahoma, 1946-1948

| Types of Surveys Compared* | Average Price | | | | | | Number of Transfers | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Time Interval Included | | | | | | Time Interval Included | | | | | |
| | Quarter | | Semi-Annual | | Annual | | Quarter | | Semi-Annual | | Annual | |
| | Dollars | Percent | Dollars | Percent | Dollars | Percent | Transfers | Percent | Transfers | Percent | Transfers | Percent |
| C.E.-Date of Rec. and C.E.-Date of Sale | 2.65 | 6.7 | 1.28 | 3.2 | .67 | 1.7 | 7.9 | 11.8 | 11.8 | 8.8 | 14.5 | 5.4 |
| Sam.-Date of Rec. and C.E.-Date of Sale | 3.81 | 9.6 | 2.54 | 6.4 | 1.87 | 4.7 | 10.1 | 15.1 | 17.3 | 12.9 | 14.2 | 5.3 |
| Sam.-Date of Rec. and C.E.-Date of Rec. | 3.77 | 9.4 | 2.24 | 5.6 | 2.01 | 5.0 | 6.6 | 10.5 | 11.9 | 9.2 | 13.3 | 5.1 |

*C.E.-Date of Rec. refers to a complete enumeration based on date of recording;
 C.E.-Date of Sale refers to a complete enumeration based on date of sale;
 Sam.-Date of Rec. refers to a fifteen-day sample based on date of recording.

complete enumerations based upon the date of sale, complete enumerations based upon the date of recording the instrument, and fifteen-day samples based upon the date of recording. The prices are taken from farm sales taking place in Payne and Grady counties during the years 1946, 1947, and 1948, and the prices are shown as they would be indicated by quarterly, semi-annual, and annual surveys.

Table 2 is similar to Table 1 but shows the number of transfers rather than the average prices per acre. The number of transfers as indicated by the fifteen-day sample is converted from the original sample number to a number comparable to the complete enumeration. This is necessary because the sample shows only the number of transfers which was recorded during the first fifteen business days of each month within the time period. Thus, for Payne county during the first quarter of 1946 the sample (not converted) shows 44 transfers, which means that 44 transfers were recorded in the 45 business days covered by the sample. As this three-month period includes a total of 74 business days, the total number of business days (74) divided by the number of sample days (45) gives a factor of 1.6444 which, when multiplied by the sample number of transfers (44) yields the converted figure of 72 transfers. A similar process was followed in the computation of the semi-annual and annual sample transfers.

Table 3 shows the average deviations of the figures given in Tables 1 and 2. As the term "average deviation" in a purely statistical definition usually refers to the average of the deviations of a series

from its mean, the figures in Table 3 might be more clearly referred to as the "averages of the differences." The average deviation in average prices between the complete enumeration date of recording and the complete enumeration date of sale for a quarterly survey may be used as an illustration of how these figures were arrived at. For the first quarter of 1946 in Payne county the complete enumeration based on date of sale gave an average price of $37.77, whereas the complete enumeration based on date of recording gave an average price of $36.36. Thus, a difference of $1.41 exists between the two ($37.77 - $36.36 = $1.41). Similar differences were calculated for each quarter for both counties and all the differences were totaled without regard to sign. This total was then divided by 24, which represents the total number of quarters covered by the two counties for the three years, and the result is the $2.65 average of the differences. This figure of $2.65 indicates that, as a simple average, a difference of $2.65 exists between the average price for a quarterly complete enumeration based upon the date of recording and the average price for a quarterly complete enumeration based on date of sale. The percentage expresses the average difference as a percent of the average of the complete enumeration date of sale prices.

The second comparison relates the fifteen-day sample based on date of recording with the complete enumeration based on date of sale. Again, the percentage expresses the average difference as a percent of the average of the complete enumeration date of sale prices. The

third comparison is between the fifteen-day sample based on date of recording and the complete enumeration based on date of recording. In this case, however, the percentage expresses the difference as a percent of the average of the complete enumeration date of recording prices as contrasted with the date of sale prices used in the previous two comparisons.

Average Price. The average prices per acre as computed under the three conditions of complete enumeration based upon date of sale, complete enumeration based upon date of recording, and fifteen-day sample based upon date of recording are shown in Table 1. The quarterly prices as plotted in Figure 2 show the magnitude of the differences existing between the three. This graph indicates that the prices as computed under each of the three methods follow a roughly parallel course and are fairly homogeneous throughout. This is important as it signifies that all three methods yield average prices which are somewhat similar.

The deviations as shown in Table 3 indicate that both actual and percentage differences between complete enumeration-date of sale average prices and complete enumeration-date of recording average prices are fairly small. This infers that, when considering average prices, the figures derived from a complete enumeration based upon the date of recording correspond rather closely with the average price of those transfers actually taking place during the relevant time period (complete enumeration-date of sale). It will be noted that the two become more similar as the time interval increases. Thus, the percentage

Figure 2. Comparison of Average Value Per Acre as Computed from Date of Sale and Date of Recording, Payne and Grady Counties, Oklahoma, Quarterly, 1946-1948

Complete Enumeration Based on Date of Sale
Complete Enumeration Based on Date of Recording
Fifteen-Day Sample Based on Date of Recording

| 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1946 | | | | 1947 | | | | 1948 | | | | 1946 | | | | 1947 | | | | 1948 | | |

Payne

Grady
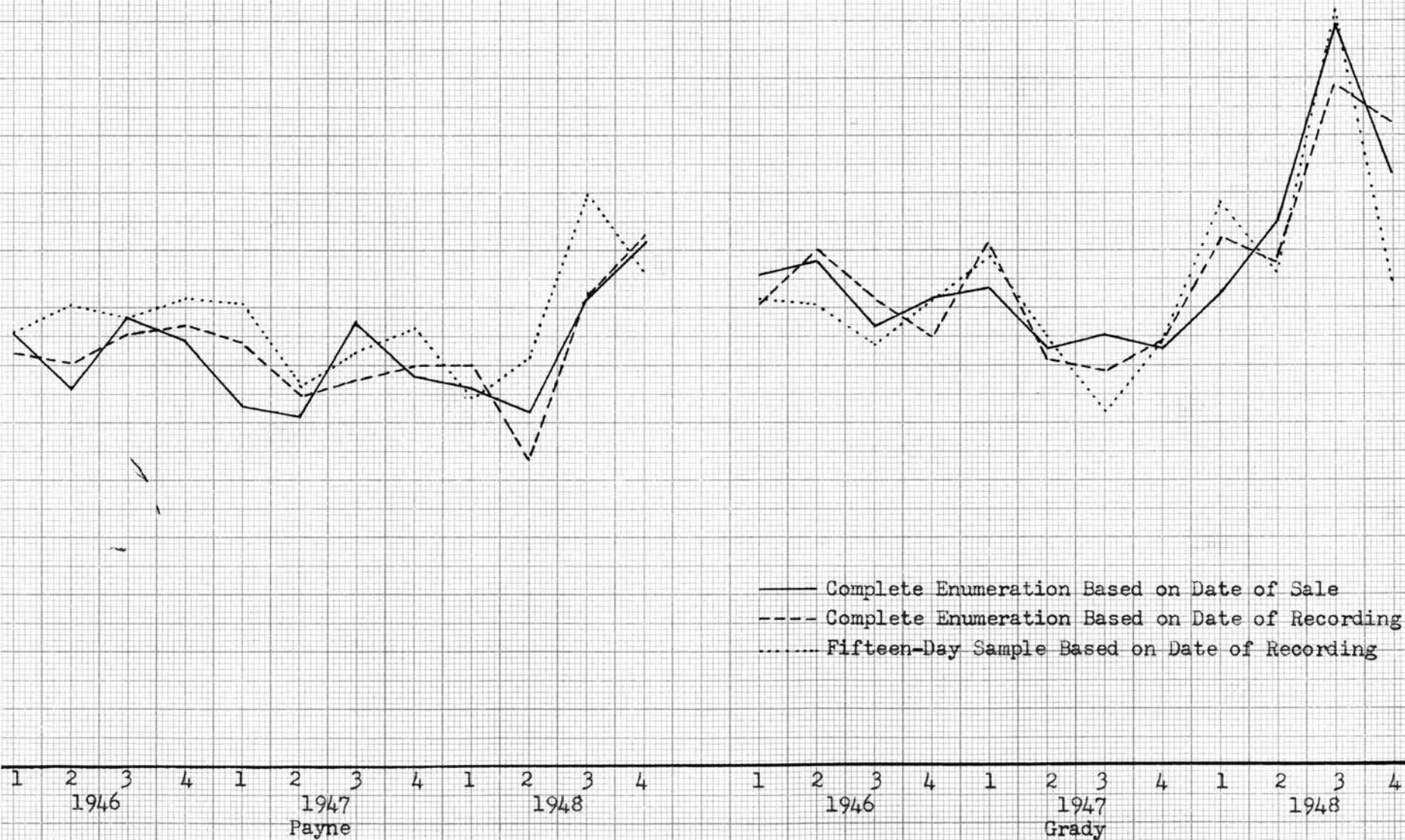
Source: See Table 1.

difference of 6.7 percent for the quarterly surveys is decreased to 1.7 percent as the time period is increased to one year.

The difference in average price between the fifteen-day sample based upon date of recording and the complete enumeration based upon date of recording is greater for each length of survey than the difference existing between the complete enumeration-date of sale and complete enumeration-date of recording just discussed. The percentage deviation in this case is 9.4 percent of the average of the complete enumeration-date of recording prices for the quarterly survey, 5.6 percent for the semi-annual survey, and 5.0 percent for the annual survey. These differences represent the error which is directly attributable to the sample technique, as both the sample and the complete enumeration are based upon the date of recording.

The question to be considered now is whether or not this direct sample difference is increased by the difference between date of recording and date of sale complete enumerations when the sample is compared with the complete enumeration-date of sale. As inferred by Table 3, complete enumeration date of recording-date of sale deviations appear to have no effect upon the comparability of the sample average price with the non-sample based upon the date of sale. The sample-date of recording and non-sample-date of sale differences for the quarterly and semi-annual surveys are only .2 percent and .8 percent greater respectively than the sample-date of recording and complete enumeration-date of recording differences. In the annual survey

the sample average price is actually .3 percent closer to the actual average price (complete enumeration based upon date of sale) than to the complete enumeration based upon date of recording. It may thus be concluded that the difference between date of sale and date of recording has no significant influence upon the reliability of sample estimates of average prices.

Number of Transfers. The number of transfers as computed under the three conditions of complete enumeration based on date of sale, complete enumeration based on date of recording, and fifteen-day sample based on date of recording are shown in Table 2, and the quarterly numbers are plotted in Figure 3. A glance at Figure 3 might lead to the assumption that, as was the case with the average prices, the above three conditions yield similar results pertaining to the number of transfers. This assumption is refuted, however, by the deviations shown in Table 3 which exhibit significantly greater differences for the number of transfers than are shown for the average prices. The difference between the quarterly complete enumeration number of transfers based upon date of recording and the quarterly complete enumeration number of transfers based upon date of sale is 7.9 transfers, or 11.8 percent of the date of sale figure. The semi-annual difference is 11.8 transfers, or 8.8 percent, and the annual difference is 14.5 transfers, or 5.4 percent. Although the differences in terms of actual number of transfers increase as the time period covered increases, the percentage differences become smaller. The reason for this is readily clarified by the

Figure 3. Comparison of Number of Transfers as Computed from Date of Sale and Date of Recording, Payne and Grady Counties, Oklahoma, Quarterly, 1946-1948
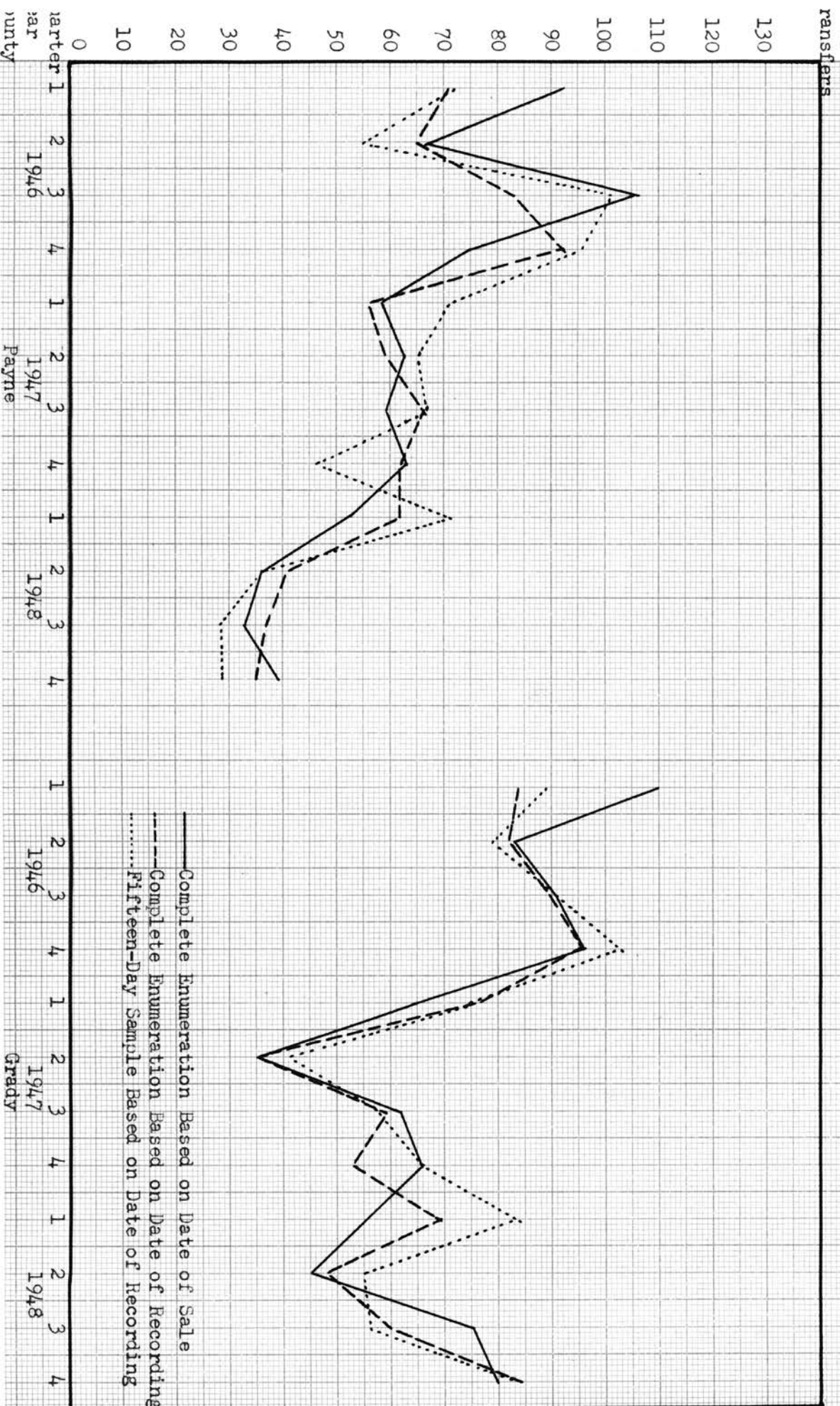
fact that the semi-annual surveys contain approximately twice as many transfers as the quarterly ones, and the annual studies contain approximately twice as many as the semi-annual. Thus, since the deviations in terms of actual numbers do not double each time, the percentage deviations decrease. This decline in percentage deviations indicates that the three classes of deviations are greater in the shorter time periods and less important in the longer time periods.

As discussed in the preceding section, the differences in average price between the fifteen-day sample-date of recording and the complete enumeration-date of recording were greater than the differences between complete enumeration-date of recording and complete enumeration-date of sale. When referring to the number of transfers, however, the differences are practically the same rather than one being greater than the other. The quarterly number of transfers, for example, exhibits a deviation of 10.5 percent between the sample based upon date of recording and the non-sample based on date of recording. The semi-annual survey shows a 9.2 percent deviation and the annual survey exhibits a 5.1 percent deviation. As both the sample and non-sample are based upon the date of recording, these deviations represent the error or difference in the number of transfers which is directly attributable to the sample technique.

The quarterly and semi-annual deviations between the sample number based on date of recording and the actual number (based on complete enumeration-date of sale) are considerably greater than the

differences discussed above which are directly attributable to the sample technique. This indicates that the sample numbers tend to cluster more closely about the complete enumeration-date of recording numbers than about the complete enumeration-date of sale. The cause of this phenomenon, however, is difficult to determine. A possible explanation is that this situation occurs as a result of the relatively large deviation between the complete enumeration based on date of recording and the complete enumeration based on date of sale. Such an explanation is open to doubt, however, and further study and analyses might result in an entirely different answer.

The annual deviation between the sample based on date of recording and the complete enumeration based on date of sale is, for all practical purposes, the same as the annual deviations under the other two conditions previously discussed. The annual deviation is smaller than the semi-annual and the semi-annual is smaller than the annual indicating, as with the average price, that the deviations become smaller as the time period covered by the survey increases.

# CHAPTER III

## RELIABILITY OF SELECTED FORMULAE IN ESTIMATING
## CASH CONSIDERATIONS FROM FEDERAL REVENUE STAMPS

When determining the cash consideration for farm real estate transfers from deed records, it is often necessary to rely upon federal revenue stamps as an indicator of the selling price as the actual consideration is usually not given on the deeds. If such is the case, the reliability of the estimated cash consideration is dependent upon the formula used for determining the value of the last $.55 revenue stamp.

It is required that federal revenue stamps equal to $.55 be attached to deeds for each $500 consideration or fraction thereof except when the total cash consideration is less than $100, in which case no revenue stamps are required. The problem encountered in estimating the cash considerations is: "What value should be assigned to the last $.55 revenue stamp?" If the deed has attached to it $1.10 of revenue stamps, the first $.55 denotes a consideration of $500, but the second stamp may mean an additional consideration of from $1 to $500. Thus, the total consideration is within a range of $501 to $1,000, but the actual amount is difficult to determine.

In previous studies the full value of $500 is assigned to each $.55 revenue stamp with the exception of the last; the value for this stamp being the mid-point, or $250. Following this rule, a deed having $1.10 of revenue stamps attached to it would be assessed a value of $750.

For transfers where the total number of stamps is only $.55 the mid-point is $300 rather than $250, as the first $100 is exempt from taxation. But just how reliable is this formula? Is this formula the most accurate and, if not, what formula should be used?

It has been found that for the lower value groups of the four Oklahoma counties investigated, the practice of giving the last $.55 stamp a value equal to its mid-value is more accurate than giving this last $.55 a value equal to the full $500. For the higher groups, the estimations based upon the full $500 value are more accurate. Both of these formulae, however, evidence sizeable errors, so a third formula is suggested in order to make the estimations more representative of the true considerations. This formula values the last $.55 revenue in the first four groupings ($.55 to $2.20 revenue) at $350. The next nine groupings ($2.75 to $7.15 revenue) are given a value of $400, and all transfers having revenue stamps of $7.70 or more are given a value of $450 for the last $.55 stamp.

For the years 1949-1952 it was necessary to estimate 74.8 percent of the considerations for Payne County from revenue stamps, 46.8 percent for Choctaw county, 71.8 percent for Grady county, and 59.2 percent for Jackson county. An analysis of the transfers in which both the cash consideration and the amount of revenue stamps were given has been made for these counties for the years 1941-1952 and the data presented in Tables 4 to 7. These tables show the number of transfers, the number and percent of transfers at the upper limit of the possible value, the average amount of cash for the last $.55 revenue stamp

Table 4. Revenue Stamps and Cash Considerations in Deed Records,
Payne County, Oklahoma, 1941-1952*

| Amount of Revenue Stamps | Transfers | Transfers at Upper Limit of Possible Value | | Average Amount of Cash for Last $.55 Revenue Stamp | Average Amount of Cash for Last $.55 Revenue Stamp in Percent of Possible Amount ($500 = 100%) | Under Estimation in Percent ($250 = 50%) |
|---|---|---|---|---|---|---|
| Dollars | Number | Number | Percent | Dollars | Percent | Percent |
| .55 | 36 | 11 | 30.6 | 407 | 81.4 | 21.4** |
| 1.10 | 79 | 29 | 36.7 | 348 | 69.6 | 19.6 |
| 1.65 | 57 | 21 | 36.8 | 331 | 66.2 | 16.2 |
| 2.20 | 68 | 30 | 44.1 | 343 | 68.6 | 18.6 |
| 2.75 | 45 | 28 | 62.2 | 411 | 82.2 | 32.2 |
| 3.30 | 49 | 26 | 53.1 | 387 | 77.4 | 27.4 |
| 3.85 | 37 | 19 | 51.4 | 369 | 73.8 | 23.8 |
| 4.40 | 41 | 22 | 53.7 | 376 | 75.2 | 25.2 |
| 4.95 | 28 | 19 | 67.9 | 442 | 88.4 | 38.4 |
| 5.50 | 24 | 19 | 79.2 | 437 | 87.4 | 37.4 |
| 6.05 | 9 | 6 | 66.7 | 408 | 81.6 | 31.6 |
| 6.60 | 15 | 12 | 80.0 | 432 | 86.4 | 36.4 |
| 7.15 | 13 | 12 | 92.3 | 477 | 95.4 | 45.4 |
| 7.70 | 11 | 9 | 81.8 | 457 | 91.4 | 41.4 |
| 8.25 | 7 | 6 | 85.7 | 464 | 92.8 | 42.8 |
| 8.80 | 13 | 11 | 84.6 | 450 | 90.0 | 40.0 |
| 9.35 | 5 | 3 | 60.0 | 406 | 81.2 | 31.2 |
| 9.90 | 2 | 1 | 50.0 | 260 | 52.0 | 2.0 |
| 10.45 | 1 | 1 | 100.0 | 500 | 100.0 | 50.0 |
| 11.00 | 8 | 6 | 75.0 | 425 | 85.0 | 35.0 |
| 11.55 and more | 23 | 22 | 95.7 | 491 | 98.2 | 48.2 |

*Adapted from Kristensen, op. cit., p. 41.
**Since the first $100 is exempt, the midpoint of this class is $300 compared with $250 for the other classes.

## Table 5. Revenue Stamps and Cash Considerations in Deed Records, Choctaw County, Oklahoma, 1941-1952

| Amount of Revenue Stamps | Transfers | Transfers at Upper Limit of Possible Value | | Average Amount of Cash for Last $.55 Revenue Stamp | Average Amount of Cash for Last $.55 Revenue Stamp in Percent of Possible Amount($500 = 100%) | Under Estimation in Percent ($250 = 50%) |
|---|---|---|---|---|---|---|
| Dollars | Number | Number | Percent | Dollars | Percent | Percent |
| .55 | 514 | 120 | 23.3 | 335 | 67.0 | 7.0* |
| 1.10 | 397 | 103 | 25.9 | 305 | 61.0 | 11.0 |
| 1.65 | 177 | 55 | 31.1 | 330 | 66.0 | 16.0 |
| 2.20 | 139 | 63 | 45.3 | 336 | 67.2 | 17.2 |
| 2.75 | 84 | 45 | 53.6 | 380 | 76.0 | 26.0 |
| 3.30 | 77 | 47 | 61.0 | 379 | 75.8 | 25.8 |
| 3.85 | 39 | 17 | 43.6 | 390 | 78.0 | 28.0 |
| 4.40 | 42 | 31 | 73.8 | 432 | 86.4 | 36.4 |
| 4.95 | 18 | 12 | 66.7 | 440 | 88.0 | 38.0 |
| 5.50 | 21 | 14 | 66.7 | 410 | 82.0 | 32.0 |
| 6.05 | 6 | 4 | 66.7 | 425 | 85.0 | 35.0 |
| 6.60 | 15 | 11 | 73.3 | 447 | 89.4 | 39.4 |
| 7.15 | 10 | 4 | 40.0 | 395 | 79.0 | 29.0 |
| 7.70 | 9 | 7 | 77.8 | 450 | 90.0 | 40.0 |
| 8.25 | 8 | 3 | 37.5 | 381 | 76.2 | 26.2 |
| 8.80 | 4 | 2 | 50.0 | 384 | 76.8 | 26.8 |
| 9.35 | --- | --- | --- | --- | --- | --- |
| 9.90 | 6 | 6 | 100.0 | 500 | 100.0 | 50.0 |
| 10.45 | 2 | 2 | 100.0 | 500 | 100.0 | 50.0 |
| 11.00 | 6 | 6 | 100.0 | 500 | 100.0 | 50.0 |
| 11.55 | --- | --- | ---- | --- | ---- | ---- |
| 12.10 | 4 | 4 | 100.0 | 500 | 100.0 | 50.0 |
| 12.65 | 2 | 2 | 100.0 | 500 | 100.0 | 50.0 |
| 13.20 | 1 | 1 | 100.0 | 500 | 100.0 | 50.0 |
| 13.75 | 1 | 1 | 100.0 | 500 | 100.0 | 50.0 |
| 14.30 | 1 | 1 | 100.0 | 500 | 100.0 | 50.0 |
| 14.85 and more | 9 | 6 | 66.7 | 401 | 80.2 | 30.2 |

*Since the first $100 is exempt, the midpoint of this class is $300 compared with $250 for the other classes.

Table 6. Revenue Stamps and Cash Considerations in Deed Records,
Grady County, Oklahoma, 1941-1952*

| Amount of Revenue Stamps | Transfers | Transfers at Upper Limit of Possible Value | | Average Amount of Cash for Last $.55 Revenue Stamp | Average Amount of Cash for Last $.55 Revenue Stamp in Percent of Possible Amount($500 = 100%) | Under Estimation in Percent ($250 = 50%) |
|---|---|---|---|---|---|---|
| Dollars | Number | Number | Percent | Dollars | Percent | Percent |
| .55 | 57 | 18 | 31.6 | 381 | 76.2 | 16.2** |
| 1.10 | 88 | 32 | 36.4 | 344 | 68.8 | 18.8 |
| 1.65 | 87 | 35 | 40.2 | 375 | 75.0 | 25.0 |
| 2.20 | 79 | 40 | 50.6 | 360 | 72.0 | 22.0 |
| 2.75 | 58 | 30 | 51.7 | 384 | 76.8 | 26.8 |
| 3.30 | 56 | 35 | 62.5 | 403 | 80.6 | 30.6 |
| 3.85 | 37 | 20 | 54.1 | 401 | 80.2 | 30.2 |
| 4.40 | 51 | 29 | 56.9 | 374 | 74.8 | 24.8 |
| 4.95 | 28 | 16 | 57.1 | 383 | 76.6 | 26.6 |
| 5.50 | 37 | 24 | 64.9 | 438 | 87.6 | 37.6 |
| 6.05 | 24 | 11 | 45.8 | 381 | 76.2 | 26.2 |
| 6.60 | 28 | 19 | 67.9 | 406 | 81.2 | 31.2 |
| 7.15 | 16 | 9 | 56.3 | 410 | 82.0 | 32.0 |
| 7.70 | 19 | 9 | 47.4 | 368 | 73.6 | 23.6 |
| 8.25 | 16 | 11 | 68.8 | 427 | 85.4 | 35.4 |
| 8.80 | 18 | 14 | 77.8 | 445 | 89.0 | 39.0 |
| 9.35 | 8 | 7 | 87.5 | 469 | 93.8 | 43.8 |
| 9.90 | 9 | 6 | 66.7 | 395 | 79.0 | 29.0 |
| 10.45 | 4 | 3 | 75.0 | 400 | 80.0 | 30.0 |
| 11.00 | 20 | 18 | 90.0 | 460 | 92.0 | 42.0 |
| 11.55 | 5 | 4 | 80.0 | 480 | 96.0 | 46.0 |
| 12.10 | 6 | 5 | 83.3 | 479 | 95.8 | 45.8 |
| 12.65 | 1 | -- | ---- | 400 | 80.0 | 30.0 |
| 13.20 | 13 | 12 | 92.3 | 492 | 98.4 | 48.4 |
| 13.75 | 5 | 5 | 100.0 | 500 | 100.0 | 50.0 |
| 14.30 | 4 | 3 | 75.0 | 400 | 80.0 | 30.0 |
| *14.85 and more | 41 | 37 | 90.2 | 478 | 95.6 | 45.6 |

*Adapted from Kristensen, op. cit., p. 42.
**Since the first $100 is exempt, the midpoint of this class is $300 compared with $250 for the other classes.

## Table 7. Revenue Stamps and Cash Considerations in Deed Records, Jackson County, Oklahoma, 1941-1952

| Amount of Revenue Stamps | Transfers | Transfers at Upper Limit of Possible Value | | Average Amount of Cash for Last $.55 Revenue Stamp | Average Amount of Cash for Last $.55 Revenue Stamp in Percent of Possible Amount($500 = 100%) | Under Estimation in Percent ($250 = 50%) |
|---|---|---|---|---|---|---|
| Dollars | Number | Number | Percent | Dollars | Percent | Percent |
| .55 | 17 | 6 | 35.3 | 381 | 76.2 | 16.2* |
| 1.10 | 31 | 12 | 38.7 | 356 | 71.2 | 21.2 |
| 1.65 | 26 | 9 | 34.6 | 358 | 71.6 | 21.6 |
| 2.20 | 31 | 16 | 51.6 | 360 | 72.0 | 22.0 |
| 2.75 | 28 | 17 | 60.7 | 411 | 82.2 | 32.2 |
| 3.30 | 32 | 21 | 65.6 | 405 | 81.0 | 31.0 |
| 3.85 | 33 | 14 | 42.4 | 363 | 72.6 | 22.6 |
| 4.40 | 37 | 27 | 73.0 | 422 | 84.4 | 34.4 |
| 4.95 | 19 | 15 | 78.9 | 455 | 91.0 | 41.0 |
| 5.50 | 39 | 27 | 69.2 | 425 | 85.0 | 35.0 |
| 6.05 | 15 | 11 | 73.3 | 446 | 89.2 | 39.2 |
| 6.60 | 30 | 26 | 86.7 | 465 | 93.0 | 43.0 |
| 7.15 | 24 | 9 | 37.5 | 351 | 70.2 | 20.2 |
| 7.70 | 19 | 16 | 84.2 | 476 | 95.2 | 45.2 |
| 8.25 | 18 | 12 | 66.7 | 441 | 88.2 | 38.2 |
| 8.80 | 20 | 18 | 90.0 | 487 | 97.4 | 47.4 |
| 9.35 | 8 | 5 | 62.5 | 421 | 84.2 | 34.2 |
| 9.90 | 11 | 7 | 63.6 | 405 | 81.0 | 31.0 |
| 10.45 | 4 | 2 | 50.0 | 375 | 75.0 | 25.0 |
| 11.00 | 21 | 16 | 76.2 | 451 | 90.2 | 40.2 |
| 11.55 | 9 | 7 | 77.8 | 428 | 85.6 | 35.6 |
| 12.10 | 15 | 11 | 73.3 | 433 | 86.6 | 36.6 |
| 12.65 | 7 | 2 | 28.6 | 280 | 56.0 | 6.0 |
| 13.20 | 12 | 11 | 91.7 | 442 | 88.4 | 38.4 |
| 13.75 | 4 | 3 | 75.0 | 425 | 85.0 | 35.0 |
| 14.30 | 13 | 9 | 69.2 | 421 | 84.2 | 34.2 |
| *14.85 and more | 55 | 31 | 56.4 | 341 | 68.2 | 18.2 |

*Since the first $100 is exempt, the midpoint of this class is $300 compared with $250 for the other classes.

expressed both in dollars and in percent of possible amount, and the percentage under-estimation when the estimate is based upon the mid-value of the last stamp.

It will be noted that there is a general trend for the percent of transfers at the upper limit of possible value to increase as the amount of federal revenue stamps increases. This shows a tendency on the part of buyers and sellers to round off the consideration to an even figure as the size of the consideration grows larger. It will also be noted that the average amount of cash for the last $.55 revenue stamp and the percentage under-estimation both show a similar tendency to increase as the number of revenue stamps increases.

The four graphs, (Figures 4 through 7) illustrate the relationships between the actual cash considerations for the last $.55 revenue stamp and the estimated considerations based on full-value and on mid-value. The solid lines indicate the actual average amount of cash for the last $.55 revenue stamp as given in Tables 4 through 7. The dotted lines represent the mid-points between estimated considerations based upon the mid-value ($.55 equals $250) and estimated considerations based upon the full-value ($.55 equals $500). Whenever the actual consideration is above the dotted line it indicates that the estimated consideration based on full-value is closer to the actual consideration than is the estimated consideration based on the mid-value. When the actual consideration is below the dotted line it indicates that the estimated consideration based on the mid-value is closer to the actual consideration than is the estimated consideration based on the full-value. These

Value of Last
$.55 Revenue
Stamp
(Dollars)

Figure 4. Average Amount of Cash for Last
$.55 Revenue Stamp, Payne County,
Oklahoma, 1941-1952

Number of Revenue Stamps
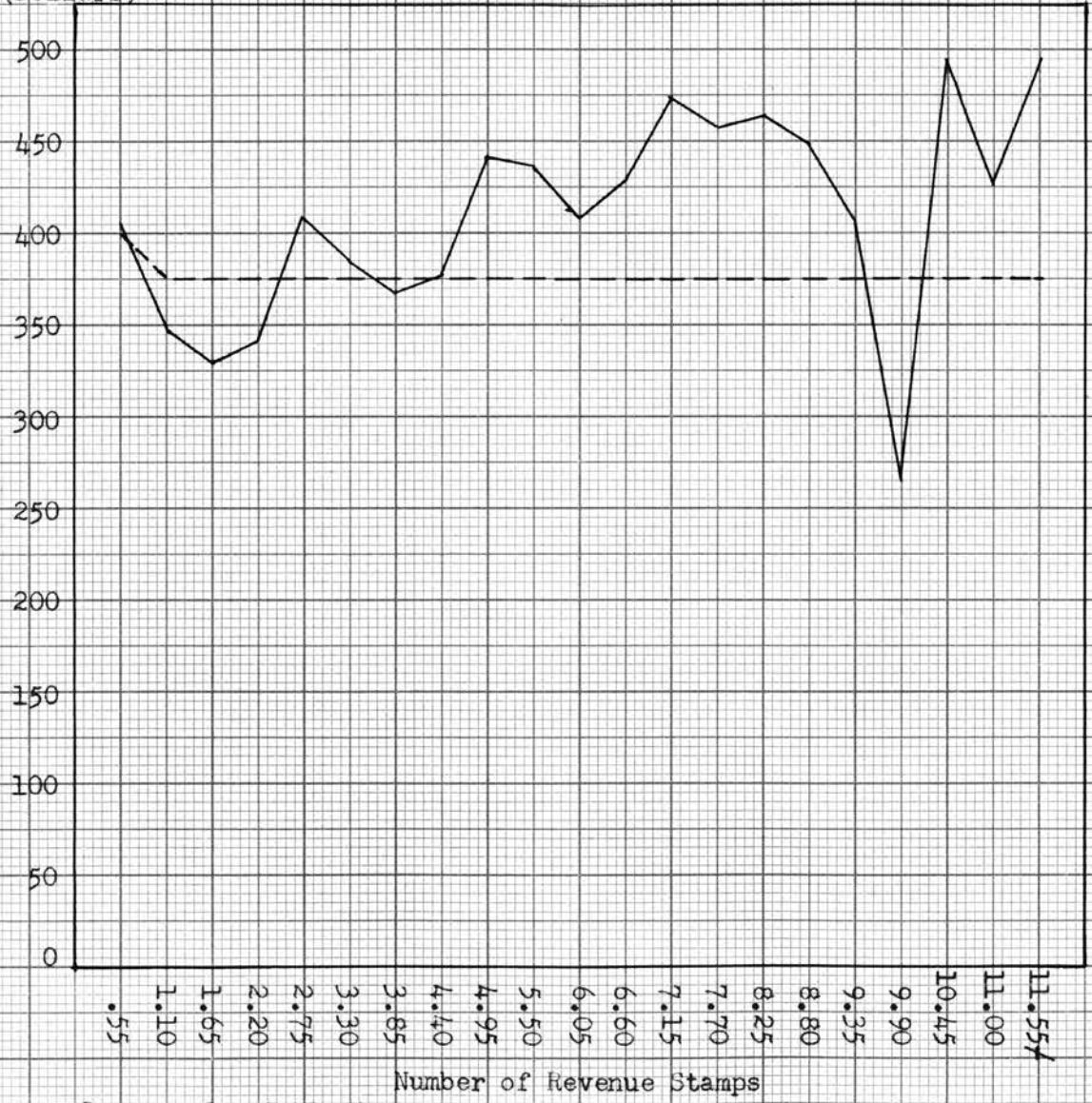
Source: See Table 4.

Figure 5. Average Amount of Cash for Last $.55 Revenue Stamp, Choctaw County, Oklahoma, 1941-1952

Value of Last $.55 Revenue Stamp (Dollars)

Number of Revenue Stamps
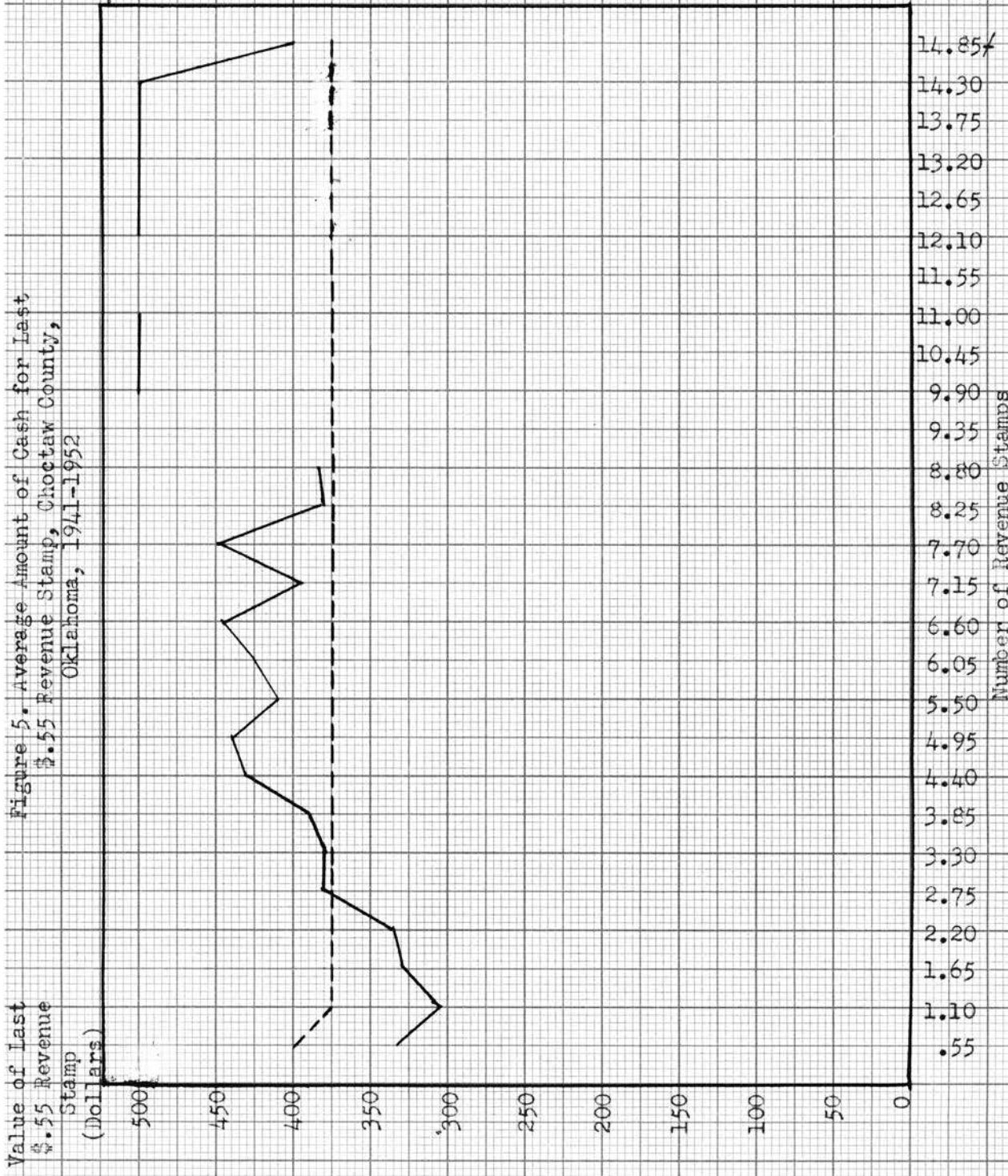
Source: See Table 5.

Figure 6. Average Amount of Cash for Last $.55 Revenue Stamp, Grady County, Oklahoma, 1941-1952
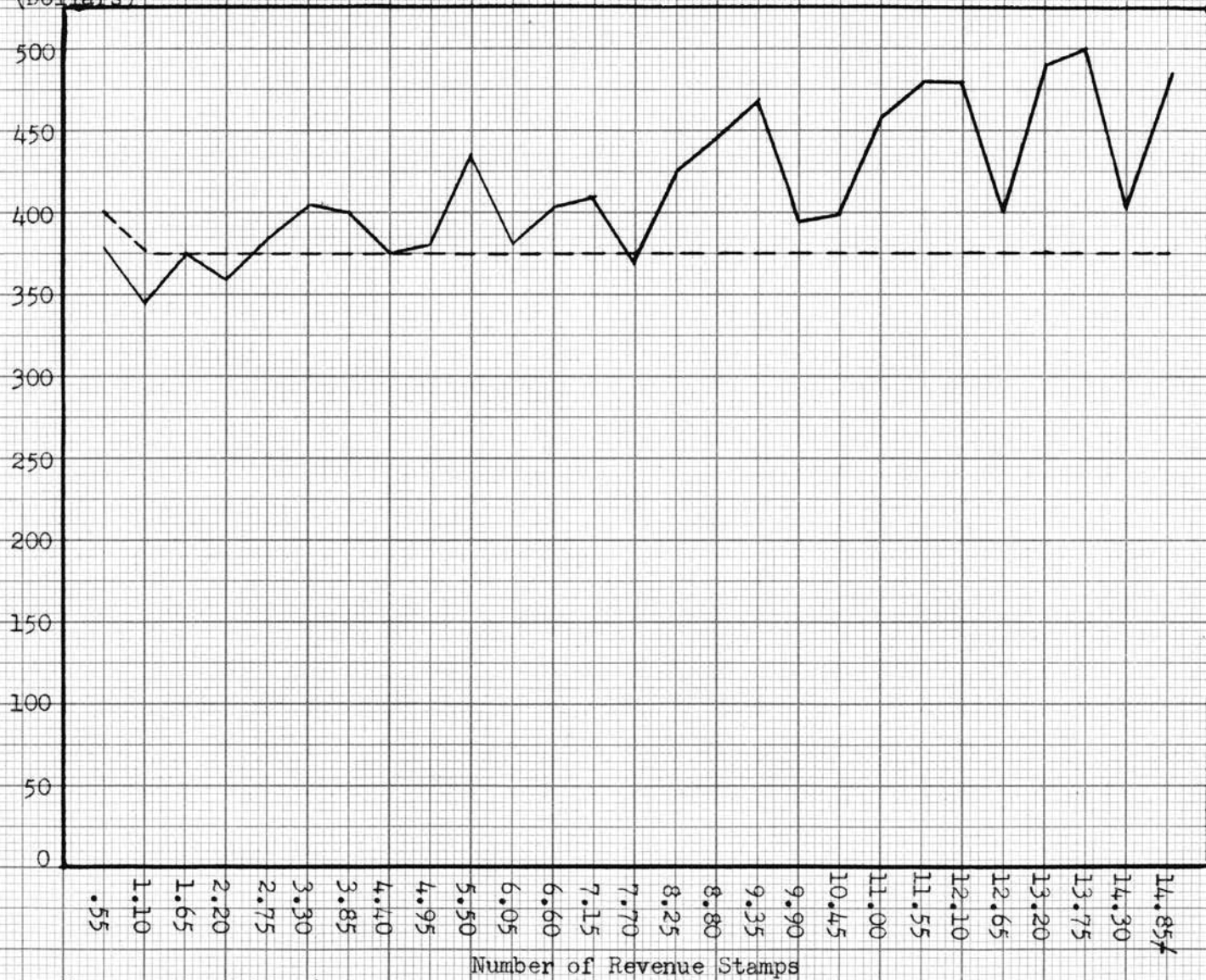
Source: See Table 6.

Value of Last
$.55 Revenue
Stamp
(Dollars)

Figure 7. Average Amount of Cash for Last
$.55 Revenue Stamp, Jackson County,
Oklahoma, 1941-1952

500
450
400
350
300
250
200
150
100
50
0

.55
1.10
1.65
2.20
2.75
3.30
3.85
4.40
4.95
5.50
6.05
6.60
7.15
7.70
8.25
8.80
9.35
9.90
10.45
11.00
11.55
12.10
12.65
13.20
13.75
14.30
14.85

Number of Revenue Stamps
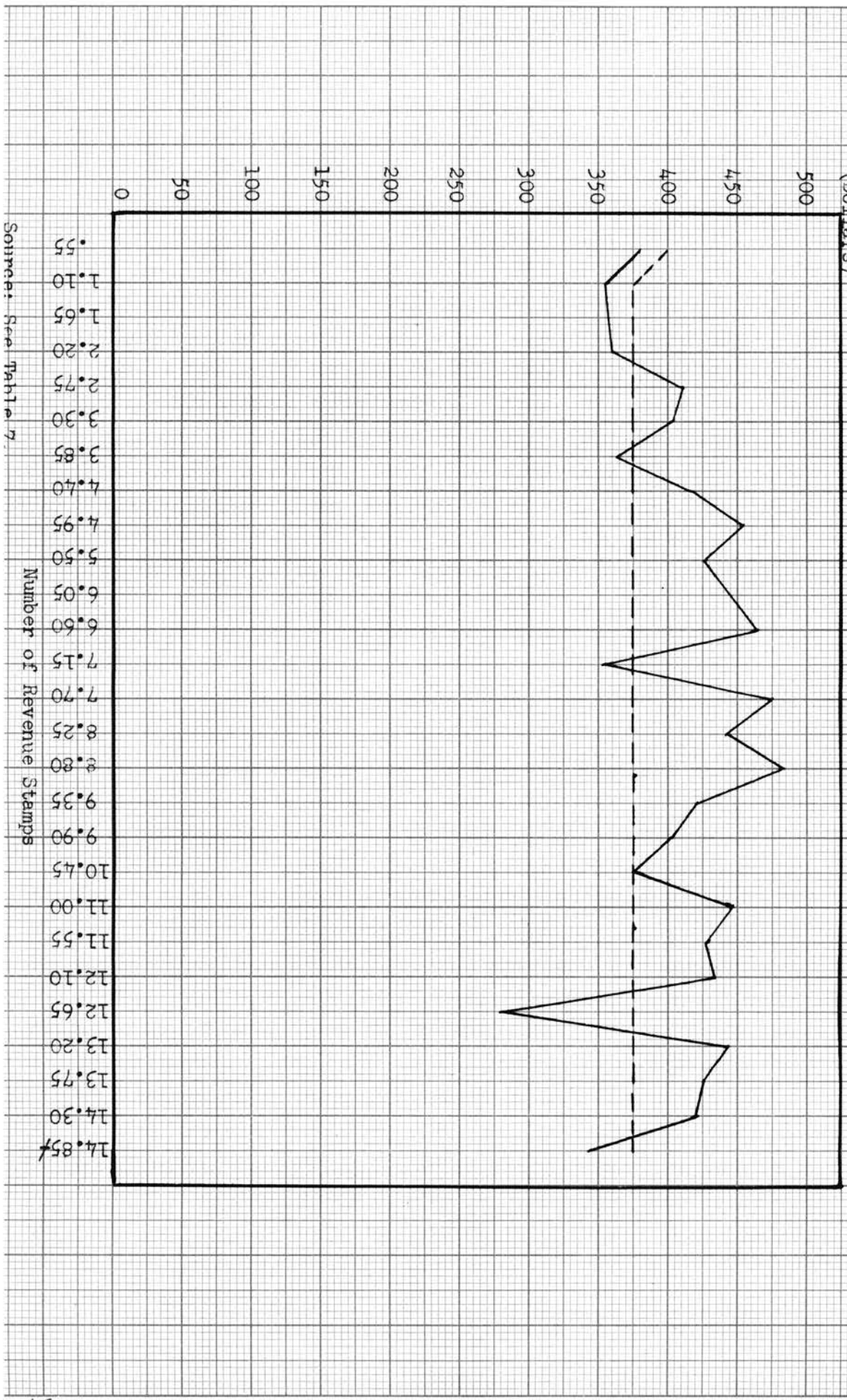
Source: See Table 7.

graphs show that, except, for the lower groupings, the estimated consideration based upon the full-value of $500 is, in most cases, more accurate than the estimated consideration based upon the $250 mid-value. It also shows that the actual value of the last $.55 revenue stamp becomes progressively closer to the full $500 as the size of the consideration increases.

Thus far the discussion has dealt only with the actual and percentage differences with reference to the value of the last $.55 revenue stamp. In order to understand the practical aspects of the problem, however, it is necessary to study the differences between the actual and estimated total cash considerations rather than merely the last $500. For example, a difference of $75 exists between the actual consideration and the estimated consideration based on full-value for transfers indicating $11.00 revenue stamps in Payne county. This represents a difference of 15 percent of the value of the last $500 and might appear quite significant. When expressed as a percentage of the total consideration of $10,000, however, the difference is only .75 percent, a negligible amount.

In order to determine the actual size of the differences between the estimated and the actual considerations, the total considerations for all four counties were estimated under three different formulae and compared with the total of the actual considerations. Table 8 shows these differences as percentages of the actual considerations.

The first formula bases the consideration on the mid-value of the

Table 8. Percentage Deviations of Estimated Total Cash
Considerations from Actual Total Cash Considerations,
Payne, Choctaw, Grady, and Jackson Counties,
Oklahoma, 1941-1952

| Amount of Revenue Stamps | Deviations | | |
|---|---|---|---|
| | : Formula 1* | : Formula 2** | : Formula 3*** |
| Dollars | Percent | | |
| .55 | -12.9 | +45.1 | +1.6 |
| 1.10 | - 8.4 | +22.1 | +3.8 |
| 1.65 | - 7.0 | +11.6 | - .7 |
| 2.20 | - 5.2 | + 8.4 | + .2 |
| 2.75 | - 5.9 | + 4.5 | + .4 |
| 3.30 | - 4.9 | + 3.8 | + .3 |
| 3.85 | - 3.9 | + 3.5 | + .6 |
| 4.40 | - 3.8 | + 2.6 | --- |
| 4.95 | - 4.0 | + 1.7 | - .6 |
| 5.50 | - 3.6 | + 1.4 | - .6 |
| 6.05 | - 5.9 | + 1.8 | - .1 |
| 6.60 | - 3.2 | + 1.1 | - .6 |
| 7.15 | - 2.3 | + 1.6 | --- |
| 7.70 | - 2.6 | + 1.0 | + .2 |
| 8.25 | - 2.4 | + .9 | + .3 |
| 8.80 | - 2.6 | + .5 | - .1 |
| 9.35 | - 2.2 | + .8 | + .2 |
| 9.90 | - 1.8 | + 1.0 | + .4 |
| 10.45 | - 1.8 | + .9 | + .3 |
| 11.00 | - 2.1 | + .4 | - .1 |
| 11.55 | - 2.1 | + .3 | - .2 |
| 12.10 | - 1.9 | + .4 | --- |
| 12.65 | - .8 | + 1.4 | +1.0 |
| 13.20 | - 1.8 | + .3 | - .2 |
| 13.75 | - 1.8 | + .2 | - .2 |
| 14.30 | - 1.3 | + .6 | + .2 |
| 14.85+ | - 1.1 | + .7 | + .4 |
| Total | - 4.0 | + 4.0 | + .2 |

*Last $.55 revenue stamp equals $250. If total revenue is only
   $.55, consideration is estimated at $300.
**Last $.55 revenue stamp equals $500.
***Las $.55 revenue stamp is valued at $350 for transfers showing
   revenue of $.55 to $2.20, $400 for revenues between $2.75
   and $7.15, and $450 for revenues of $7.70 and more.

grouping: the last $.55 revenue stamp indicates a consideration of $250 except when the total revenue is only $.55, in which case the mid-value is $300. The second formula assumes that the last $.55 revenue is equal to the full-value of $500. The third formula gives a value of $350 to the last $.55 revenue stamp when total revenue is between $.55 and $2.20. From a total revenue of $2.75 to $7.15 the estimated value for the last $.55 revenue stamp is $400, and for total revenues of $7.70 and more the estimated value for the last $.55 revenue stamp is $450.

This table shows that estimated considerations based on all three formulae tend to show a smaller percentage deviation from the actual total cash consideration as the size of the consideration increases. Thus, it is in the smaller groupings where a large error is most likely to be evidenced.

It will be noted that, except for the revenue groupings of $.55, $1.10, $1.65, $2.20, and $12.65, the deviations of the mid-value estimations (formula 1) are greater than the deviations of the full-value estimations (formula 2). This might indicate that the estimates based on the full-value of $500 are generally more reliable than the estimates based upon the $250 mid-value and that the full-value estimates should be used in preference to the mid-value estimates.

However, the statement above might be challenged on the grounds that most transfers usually fall within the lower groupings where the mid-value estimate is more reliable. Such a challenge is borne out when the deviations are weighted by the number of transfers in each grouping and

the total estimations based upon both formulae are compared with the total actual considerations. It is found that the mid-value estimations (formula 1) are 4.0 percent less than the actual considerations whereas the full-value estimations (formula 2) are 4.0 percent greater than the actual considerations. Thus, since both formulae represent a 4.0 percent error, it is largely a matter of personal choice as to which of the two should be used. However, the extremely large deviations in the full-value estimations for the $.55 and $1.10 groupings (deviations of 45.1 percent and 22.1 percent respectively) make this estimation formula the less desirable one of the two.

The third formula shows a decided improvement in reliability over the other two formulae just discussed. Even in the lower groupings where the inaccuracies tend to be greatest, this formula displays relatively small deviations. The largest deviation occurs in the $1.10 grouping where the consideration estimated on the basis of this formula is only 3.8 percent more than the actual consideration. In several cases the estimations are less than one-tenth of a percentage point away from the actual considerations ($4.40, $7.15, and $12.10 groupings). The estimations based on this formula are in all cases nearer to the actual considerations than are the estimations based upon the full-value (formula 2) and in all cases except one ($12.65 grouping) are nearer than the estimations based upon the mid-value (formula 1). Whereas the totals of the estimated considerations based on formulae 1 and 2 deviate 4.0 percent from the total of the actual consideration, the total consideration estimated by means of formula 3 deviates only .2 percent.

The formula basing estimations upon the full-value of the last $.55 revenue stamp (formula 2) is the simplest to apply but is undesirable due to its large deviations in the lower groupings. Formula 1 estimations deviate slightly more in the higher groupings than formula 2 but these slight inaccuracies are compensated for by the greater accuracy which estimations based on formula 1 possess in the lower groupings. However, even these inaccuracies in formula 1 (12.9 percent in the $.55 grouping and 8.4 percent in the $1.10 grouping) may be considered as being too large for certain types of research. The greatest accuracy throughout all ranges for the four Oklahoma counties investigated is found in estimations based upon formula 3, and if accuracy is the goal, this formula is the most desirable. Although it has the disadvantage of being the most complex of the three, this formula is not so difficult as to make its application prohibitive, and the slight increase in clerical work results in a significant increase in accuracy.

# CHAPTER IV

## COMPARATIVE COSTS OF SAMPLE AND NON-SAMPLE ENUMERATIONS OF LAND PRICES AND TRANSFERS

The objective of this chapter is to present a comparison between sample and non-sample enumeration costs. This study points out the actual economic relationships in order that they might serve as a guide by which the researcher can determine if the sampling technique is a satisfactory tool for his particular type of study. It should be realized throughout, however, that the actual dollars and cents savings are not the only determinants involved. Many projects require data other than land prices and transfers which may pertain to such things as mortgages, ownership of mineral rights, sociological implications of land transfers, or other types of information for which the sample has not as yet been proven a reliable indicator.

In order to determine the comparative costs of sample and non-sample enumerations of land prices and transfers, it is necessary to study cost and time factors which may be classified as fixed or variable. Some of the factors which may be considered as fixed are the number of transfers per hour which an enumerator can copy from the deed records, the salary (hourly) of the enumerator, and the time and expense involved in driving from one town to another. The principal variable factor is the number of transfers included in the various surveys.

Comparisons are made between the time and cost required to collect a fifteen-day sample with the time and cost required for a complete enumeration of four-, six-, and eight-county surveys covering time intervals of six months, one year, two years, three years, and four years. A brief discussion is also presented concerning the time and cost required for a complete enumeration on a three-month or quarterly basis for a four-, six-, or eight-county survey, but reference to a fifteen-day quarterly sample is omitted because of its unreliability for such a time period.[1]

The counties included in the four-county survey are Payne, Choctaw, Grady and Jackson. The six-county survey includes the preceding four with the addition of Latimer and Garfield counties, and the eight-county survey includes all those in the six-county group plus Delaware and Texas counties. All of these counties are located in Oklahoma, and their locations are indicated in Figure 8. Some of these counties have been used in previous studies of Oklahoma land market conditions and were selected randomly for use to represent several of the major different agricultural areas of the State.

### Number of Transfers

As the purpose of a sample is to decrease the number of transfers which must be copied, and consequently decrease the time and

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[1] Cable, op. cit., pp. 53-57.

OKLAHOMA

SCALE-STATUTE MILES

0  10  20  30  40  50
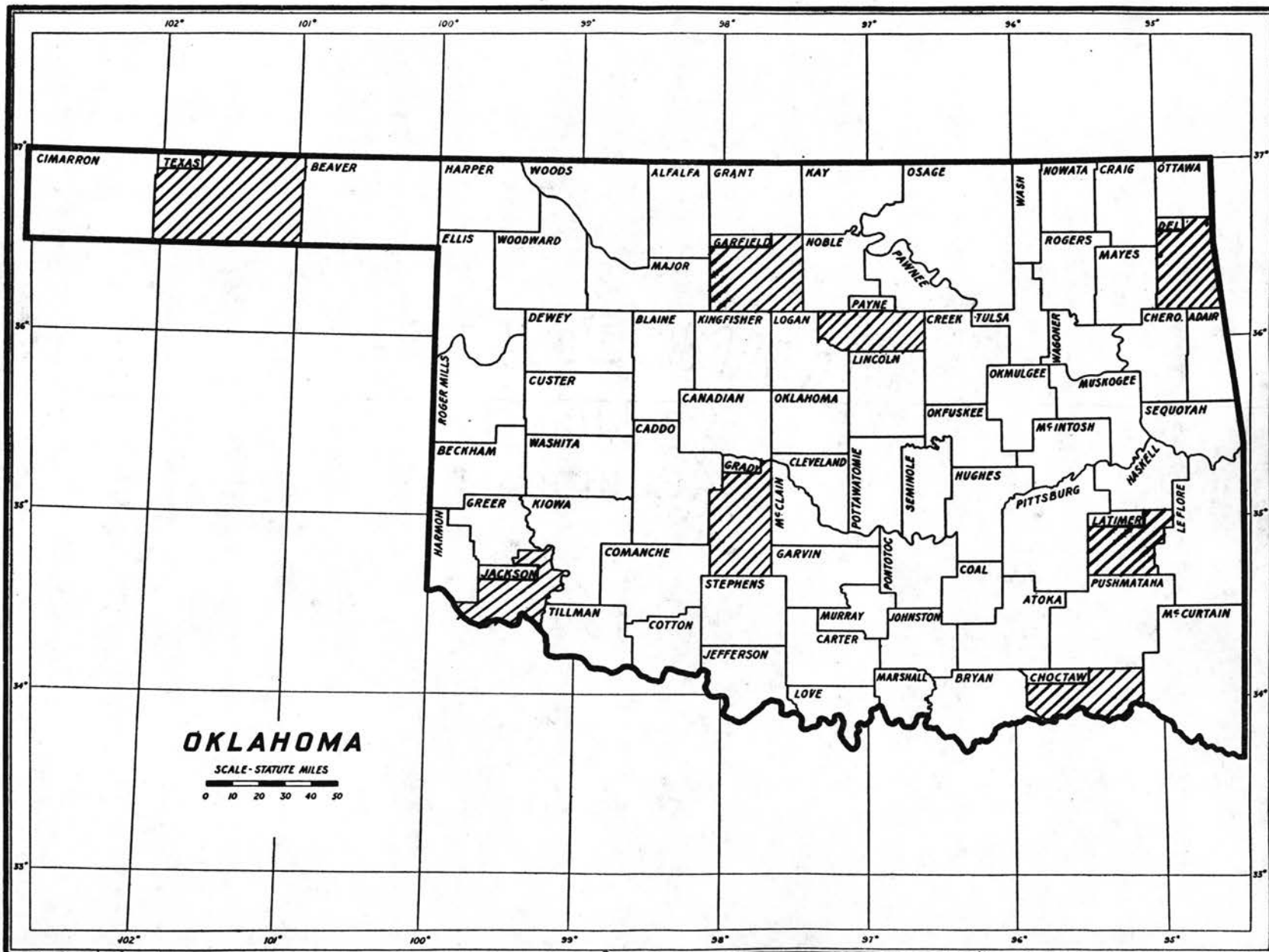
Figure 8. Location of Counties Included in Four-, Six-, and Eight-County Surveys, Oklahoma

expense of collecting these data, the number of transfers is the key
variable involved in the determination of the enumeration cost of any
sample. If a sample eliminates the necessity of copying a large num-
ber of transfers, then a substantial decrease in the amount of time
required and a decrease in the expenses involved may be expected.

The number of transfers used in the comparisons within this
chapter are shown in Table 9. The figures shown in the quarterly
column represent the number of farm transfers occurring within the
county size group during the first three months of 1952. Semi-annual
figures illustrate the number of transfers taking place during the first
six months of 1952, and the annual data represent transfers for the
entire year of 1952. Two-year data show the number of transfers in
the years 1952 and 1951 for Payne, Choctaw, Grady, Jackson, and
Texas counties. As data for years other than 1952 were not available
for Garfield, Latimer, and Delaware counties, a two-year approxi-
mation was made by multiplying the 1952 data by 2. Three-year data
show the number of transfers during 1952, 1951, and 1950. An approx-
imation similar to the above was made by multiplying the number of
1952 transfers in Garfield, Latimer, and Delaware counties by 3.
Likewise, the four-year data include 1949-1952 transfers for Payne,
Choctaw, Grady, Jackson, and Texas counties plus an approximation
for the other three. The four-county figures were determined by
totaling the data for Payne, Choctaw, Grady, and Jackson counties.
The six-county figures are the four-county data plus Latimer and

Table 9. Number of Farm Transfers Included in Fifteen-Day Sample and Complete
Enumeration Studies for Three Groups of Counties, Oklahoma,
1949-1952

| Time Interval Included in Survey | Individual Counties | | | | | | | | Number of Counties | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Payne | Choctaw | Grady | Jackson | Latimer | Garfield | Delaware | Texas | Four Counties | Six Counties | Eight Counties |
| | | | | | | | | | Transfers | | |
| **Fifteen-Day Sample** | | | | | | | | | | | |
| Quarter | --- | --- | --- | --- | --- | --- | --- | --- | ---- | --- | --- |
| Semi-Annual | 33 | 65 | 83 | 27 | 36 | 17 | 59 | 22 | 208 | 261 | 342 |
| Annual | 58 | 121 | 135 | 44 | 68 | 42 | 138 | 33 | 358 | 468 | 639 |
| Two-Years | 154 | 246 | 245 | 107 | 136 | 84 | 276 | 49 | 752 | 972 | 1297 |
| Three-Years | 293 | 328 | 368 | 171 | 204 | 126 | 414 | 77 | 1160 | 1490 | 1981 |
| Four-Years | 409 | 535 | 470 | 218 | 272 | 168 | 552 | 125 | 1632 | 2072 | 2749 |
| **Complete Enumeration** | | | | | | | | | | | |
| Quarter | 36 | 61 | 82 | 27 | 34 | 12 | 48 | 21 | 206 | 252 | 321 |
| Semi-Annual | 69 | 101 | 119 | 52 | 61 | 32 | 105 | 35 | 341 | 434 | 574 |
| Annual | 116 | 193 | 201 | 82 | 115 | 71 | 256 | 50 | 592 | 778 | 1084 |
| Two-Years | 303 | 397 | 413 | 187 | 230 | 142 | 512 | 83 | 1300 | 1672 | 2267 |
| Three-Years | 575 | 553 | 638 | 293 | 345 | 213 | 768 | 127 | 2059 | 2617 | 3512 |
| Four-Years | 745 | 875 | 805 | 372 | 460 | 284 | 1024 | 203 | 2797 | 3541 | 4768 |
| **Difference Between Fifteen-Day Sample and Complete Enumeration** | | | | | | | | | | | |
| Quarter | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semi-Annual | 36 | 36 | 36 | 25 | 25 | 15 | 46 | 13 | 133 | 173 | 232 |
| Annual | 58 | 72 | 66 | 38 | 47 | 29 | 118 | 12 | 234 | 310 | 445 |
| Two-Years | 149 | 151 | 168 | 80 | 94 | 58 | 236 | 34 | 548 | 700 | 970 |
| Three-Years | 282 | 225 | 270 | 122 | 141 | 87 | 354 | 50 | 899 | 1127 | 1531 |
| Four-Years | 336 | 340 | 335 | 154 | 188 | 116 | 472 | 78 | 1165 | 1469 | 2019 |

Garfield counties; and the eight-county includes the six-county plus Delaware and Texas counties.

As a partial explanation of the contents of Table 9, it is seen that a complete enumeration of Payne, Choctaw, Grady, and Jackson counties covering a six-month period (January-June, 1952) includes 341 transfers. A fifteen-day sample for a comparable survey requires 208 transfers. Thus, by the use of the sample the enumerator has 133 fewer transfers to copy than if he had made a complete enumeration. Likewise, a three-year survey for eight counties means that the enumerator is gathering transfer data for Payne, Choctaw, Grady, Jackson, Latimer, Garfield, Texas, and Delaware counties covering the period 1949-1952. A fifteen-day sample requires the collection of data on 1,981 transfers, whereas a complete enumeration requires an additional 1,531, or a total of 3,512 transfers.

## Basic Assumptions

Having determined the number and duration of samples to be included, it is necessary to state the specific assumptions upon which the analysis is based. These assumptions based upon actual conditions as recorded will facilitate greater convenience of investigation and a better appraisal of the results of the investigation.

The first major assumption is to hold constant the rate of recording. The rate of recording refers to the number of transfers which the enumerator can copy from the deed records within a specified length of time and for purposes of this study will be assumed to be

17.5 transfers per hour. This figure was determined from results of a study made during the month of August, 1953. Between August 5 and August 28 a total of 1,846 transfers were collected from nine counties in Oklahoma (Delaware, Choctaw, Latimer, Muskogee, Grady, Jackson, Garfield, Texas, and Woodward). A total of 148 working hours were included in this period, of which 36.5 hours were devoted to driving from town to town and 6 hours were spent abstracting titles for a concurrent project, thus leaving 105.5 hours for actually recording land transfer data. By dividing the number of transfers (1,846) by the number of recording hours (105.5), the average rate per hour is determined (17.49 or 17.5).

It should be noted that the 17.5 transfers per hour is an average rate per hour for all of the counties, and that variations will be found for each individual county. For example, in Muskogee county 193 transfers were recorded in 16 hours resulting in an hourly rate of 12.1 transfers; whereas 381 transfers were recorded in 16 hours in Texas county, giving a rate of 23.8 transfers per hour. In explaining the wide variation between recording rates it should first be made clear that the transfer data were found by "thumbing through" the county records for the time interval covered (i.e., first quarter, 1952; first six months, 1953) until all warranty deeds indicating actual land transfers occurring within the time period were found and recorded. The difference in the speed which the enumerator is able to record the land transfers is brought about mainly by the different methods employed

in the various counties for filing deeds. In the above case two extremes
of this are presented. Texas county employs a very detailed break-
down of each type of instrument and files each type in a separate book.
Thus, all warranty deeds are filed in a separate book, all quit-claim
deeds in another, all mineral deeds in another, etc. As the informa-
tion required for the land market survey could be acquired only from
warranty deeds, the work was speeded up considerably with the elimi-
nation of extraneous instruments. Muskogee county, on the other hand,
employs a filing system by which all instruments recorded in the
county clerk's office are filed in one Miscellaneous Records book. As
a result, the job of "thumbing through" the records searching for war-
ranty deeds of farm sales is lengthened quite considerably due to the
large number of other instruments which must be scanned.

In addition to differences in the method of filing deeds, another
factor causing variations in the rate of recording between counties is
the number of urban transfers. Even if Muskogee county had employed
the same method of filing deeds as used in Texas county, the rate of
recording would still be slower in Muskogee county due to the large
number of urban land transfers in Muskogee county and the relative
lack of them in Texas county.

It should be emphasized that the rate of recording of 17.5 trans-
fers per hour is not to be construed as a recommendation for an ideal
rate nor to establish a standard which other enumerators should follow.
Rather, it is intended that this rate be accepted merely as an average

rate based upon actual conditions for the data of this study to facilitate analysis. Average rates of recording for the other counties were: Delaware, 24.0; Choctaw, 16.0; Latimer, 20.0; Grady, 15.4; Jackson, 9.3; Garfield, 10.5; and Woodward county, 15.0 transfers per hour. Other assumptions include: a work week of 44 hours, a wage rate of $1.35 per hour, expense allowance of $3.00 per night for lodging and $1.00 per meal while on the road, and an average driving speed of 40 miles per hour. Gasoline expenses are computed at the rate of $.30 per gallon and gas mileage is assumed to be 14 miles per gallon. As a vehicle is ordinarily furnished by the college or research station, no allowances are made for servicing or depreciation as it is assumed for purposes of this study that these expenditures are not charged to project funds.

Payne county is assumed to be a headquarters or base of operations for the survey and no expense allowances are made for the time spent recording deeds there. Also, time and expense allowances are made to enable the enumerator to return to Payne county by the end of each work week.

In some instances the salary of the project leader is paid wholly or partly from project funds. If such were the case, utilization of the sample might affect the amount of money which must be paid to the project leader for his salary by shortening the length of time required to complete the project. In order to avoid the complexities arising from such a situation this study assumes that his salary is derived

totally from an outside source (college or research agency) and that he is available to devote necessary time to the land market project without drawing a salary from project funds.

Procedure

Tables 10, 11, and 12 facilitate the estimation of comparative costs and time requirements of sample and non-sample enumerations. Table 10 shows the number of hours required to copy the land market data from the deed records under both fifteen-day sample and complete enumeration conditions by each county and by survey size groups. The number of hours as shown in Table 10 were arrived at by dividing the number of transfers shown in Table 9 by the average number of transfers copied per hour (17.5). For example, a three-year complete enumeration study on a four-county basis requires the copying of 2,059 transfers. By dividing the number of transfers (2,059) by the number of transfers per hour (17.5), the figure 117.7 is arrived at. This figure (117.7) indicates that 117.7 hours will be required to copy the transfer data from deed records for Payne, Choctaw, Grady, and Jackson counties covering a three-year period (in this case; 1950, 1951, and 1952).

Table 11 shows the salary which would be paid to the enumerator for the time spent recording transfer data in each type of survey. This figure is obtained by multiplying the number of hours required to copy the transfer data as shown in Table 10 by the hourly wage of the enumerator ($1.35). Following through on the above example, Table 12

**Table 10. Number of Hours Required to Record Land Transfer Deed Data for Fifteen-Day Sample and Complete Enumeration Studies for Three Groups of Counties, Oklahoma, 1949-1952**

| Time Interval Included in Survey | Individual Counties | | | | | | | | Number of Counties | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Payne | Choctaw | Grady | Jackson | Latimer | Garfield | Delaware | Texas | Four Counties | Six Counties | Eight Counties |
| | | | | | Hours | | | | | | |
| **Fifteen-Day Sample** | | | | | | | | | | | |
| Quarter | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ----- | ----- | ----- |
| Semi-Annual | 1.9 | 3.7 | 4.7 | 1.5 | 2.1 | 1.0 | 3.4 | 1.3 | 11.8 | 14.9 | 19.6 |
| Annual | 3.3 | 6.9 | 7.7 | 2.5 | 3.9 | 2.4 | 7.9 | 1.9 | 20.4 | 26.7 | 36.5 |
| Two-Years | 8.8 | 14.1 | 14.0 | 6.1 | 7.8 | 4.8 | 15.7 | 2.8 | 43.0 | 55.6 | 74.1 |
| Three-Years | 16.7 | 18.7 | 21.0 | 9.8 | 11.7 | 7.2 | 23.7 | 4.4 | 66.2 | 85.1 | 113.2 |
| Four-Years | 23.3 | 30.6 | 26.9 | 12.5 | 15.5 | 9.6 | 31.5 | 7.1 | 93.3 | 118.4 | 157.0 |
| **Complete Enumeration** | | | | | | | | | | | |
| Quarter | 2.1 | 3.5 | 4.7 | 1.5 | 1.9 | .7 | 2.7 | 1.2 | 11.8 | 14.4 | 18.3 |
| Semi-Annual | 3.9 | 5.8 | 6.8 | 3.0 | 3.5 | 1.8 | 6.0 | 2.0 | 19.5 | 24.8 | 32.8 |
| Annual | 6.6 | 11.0 | 11.5 | 4.7 | 6.6 | 4.1 | 14.6 | 2.9 | 33.8 | 44.5 | 62.0 |
| Two-Years | 17.3 | 22.7 | 23.6 | 10.7 | 13.1 | 8.1 | 29.3 | 4.7 | 74.3 | 95.5 | 129.5 |
| Three-Years | 32.9 | 31.6 | 36.5 | 16.7 | 19.7 | 12.2 | 43.9 | 7.2 | 117.7 | 149.6 | 200.7 |
| Four-Years | 42.6 | 50.0 | 46.0 | 21.2 | 26.3 | 16.2 | 58.5 | 11.6 | 159.8 | 202.3 | 272.4 |

Table 11.  Salary of Enumerator for Time Spent Recording Land Transfer
Deed Data for Fifteen-Day Sample and Complete Enumeration
Studies for Three Groups of Counties, Oklahoma,
1949-1952

| Time Interval Included in Survey | Individual Counties | | | | | | | | Number of Counties | | |
| | Payne | Choctaw | Grady | Jackson | Latimer | Garfield | Delaware | Texas | Four Counties | Six Counties | Eight Counties |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | | | Dollars | | | | | | |
| **Fifteen-Day Sample** | | | | | | | | | | | |
| Quarter | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semi-Annual | 2.57 | 5.00 | 6.34 | 2.02 | 2.84 | 1.35 | 4.59 | 1.75 | 15.93 | 20.12 | 26.46 |
| Annual | 4.45 | 9.31 | 10.40 | 3.38 | 5.26 | 3.24 | 10.67 | 2.57 | 27.54 | 36.04 | 49.28 |
| Two-Years | 11.88 | 19.03 | 18.90 | 8.24 | 10.53 | 6.48 | 21.20 | 3.78 | 58.05 | 75.06 | 100.04 |
| Three-Years | 22.54 | 25.25 | 28.35 | 13.23 | 15.79 | 9.72 | 32.00 | 5.94 | 89.37 | 114.88 | 152.82 |
| Four-Years | 31.45 | 41.31 | 36.32 | 16.88 | 20.92 | 12.96 | 42.53 | 9.58 | 125.96 | 159.84 | 211.95 |
| **Complete Enumeration** | | | | | | | | | | | |
| Quarter | 2.84 | 4.73 | 6.34 | 2.02 | 2.57 | .94 | 3.64 | 1.62 | 15.93 | 19.44 | 24.70 |
| Semi-Annual | 5.26 | 7.83 | 9.18 | 4.05 | 4.73 | 2.43 | 8.10 | 2.70 | 26.32 | 33.48 | 44.28 |
| Annual | 8.91 | 14.85 | 15.53 | 6.34 | 8.91 | 5.54 | 19.71 | 3.91 | 45.63 | 60.08 | 83.70 |
| Two-Years | 23.36 | 30.64 | 31.86 | 14.44 | 17.68 | 10.94 | 39.56 | 6.34 | 100.30 | 128.92 | 174.82 |
| Three-Years | 44.42 | 42.66 | 49.28 | 22.54 | 26.59 | 16.47 | 59.26 | 9.72 | 158.90 | 201.96 | 270.94 |
| Four-Years | 57.51 | 67.50 | 62.10 | 28.62 | 35.50 | 21.87 | 78.98 | 15.66 | 215.73 | 273.10 | 367.74 |

Table 12.  Time and Expense Required for Travel Between County
Seats, Selected Counties, Oklahoma

| Origin-Destination Counties | Distance Miles | Gasoline Required Gallons | Gasoline Expense Dollars | Time Required Hours | Salary Expense Dollars |
|---|---|---|---|---|---|
| Payne-Delaware | 158 | 11.3 | 3.39 | 4.0 | 5.40 |
| Payne-Latimer | 188 | 13.4 | 4.02 | 4.7 | 6.35 |
| Latimer-Choctaw | 90 | 6.4 | 1.92 | 2.3 | 3.11 |
| Payne-Choctaw | 241 | 17.2 | 5.16 | 6.0 | 8.10 |
| Choctaw-Grady | 190 | 13.6 | 4.08 | 4.8 | 6.48 |
| Payne-Grady | 111 | 7.9 | 2.37 | 2.8 | 3.78 |
| Grady-Jackson | 110 | 7.9 | 2.37 | 2.8 | 3.78 |
| Payne-Jackson | 221 | 15.8 | 4.74 | 5.5 | 7.43 |
| Jackson-Garfield | 193 | 13.8 | 4.14 | 4.8 | 6.48 |
| Grady-Garfield | 98 | 7.0 | 2.10 | 2.5 | 3.38 |
| Payne-Garfield | 64 | 4.6 | 1.38 | 1.6 | 2.16 |
| Payne-Texas | 295 | 21.1 | 6.33 | 7.4 | 9.99 |
| Delaware-Latimer | 178 | 12.7 | 3.81 | 4.5 | 6.08 |
| Garfield-Texas | 231 | 16.5 | 4.95 | 5.8 | 7.84 |
| Jackson-Texas | 252 | 18.0 | 5.40 | 6.3 | 8.51 |

shows that the enumerator's salary for the time spent recording deeds

is $158.90 for a three-year complete enumeration study of four coun-

ties. This figure is the result of multiplying the number of hours (117.7)

by the hourly wage rate ($1.35).

The data shown in Table 12 pertain to the time and expense re-

quired to travel from one county seat to another. The figures in the

first column represent the number of miles as indicated by a road map

from one county seat to another. The second column shows the num-

ber of gallons of gasoline necessary to cover such a distance. These

figures were obtained by dividing the number of miles by the miles per

gallon which the vehicle is estimated to attain (14 miles per gallon).

Thus, as indicated by a road map, the distance from Stillwater, the

county seat of Payne county, to Jay, the county seat of Delaware coun-

ty, is 158 miles. By dividing 158 miles by 14 miles per gallon, 11.3

gallons are arrived at.

The gasoline expense figures in the third column of Table 12 are

obtained by multiplying the number of gallons of gasoline by the price

per gallon ($.30). Following the example of Payne county to Delaware

county wherein the quantity of gasoline required is 11.3 gallons, it is

found that the total gasoline expense for this trip is $3.39. The time

required to travel from one location to another is shown in the fourth

column of this table. This figure is computed by dividing the number

of map miles as shown in the first column by the average number of

miles traveled per hour (40). From Payne county to Delaware county

it is estimated that the trip will take 4 hours, as given by dividing 158
miles by a rate of 40 miles per hour.

The last column in Table 12 indicates the salary which must be
paid to the enumerator for the time he spends driving from one loca-
tion to another. The figures for this column are computed in a man-
ner similar to the computation of the enumerator's salary for record-
ing deed data shown in Table 11. The driving salary is obtained by
multiplying the average hourly wage of the enumerator ($1.35) by the
number of hours between points shown in the fourth column of Table
12. Thus, the enumerator would be paid $5.40 for driving from Payne
county to Delaware county since the trip requires 4 hours and his
hourly wage rate is $1.35.

With these data the procedure in computing the number of hours
and the expense involved in collecting data for each type of survey is
mostly mechanical. However, the procedure is definitely not one of
merely totaling the time and expense of recording the data and the
time and expense of driving from town to town. Consideration must
be given to the number of nights spent in hotels, the number of meals
eaten while on the road (away from Payne county), and also to the
fact that quite frequently the enumerator will be halfway through with
one county at the end of the week and has to return to that county at
the beginning of the next week in order to complete it, with the re-
sult that gasoline, driving salary, and food and lodging costs are in-
creased.

In order to illustrate the procedure used in arriving at total time and expense requirements a step-by-step analysis is undertaken of one of the more complex surveys which includes some of the problems outlined above. In addition, a detailed description of the manner of collecting the data is presented. Table 13 gives a complete breakdown of each hour and each dollar which must be expended in collecting the transfer data for a fifteen-day sample of eight counties including transfers occurring within a four-year period of time.

Beginning with Payne county, Table 10 shows that it requires 23.3 hours to collect the data and that the enumerator's salary is $31.45. As Payne county is designated as the home county no expenses are paid for food, lodging, or gasoline. To complete Payne county requires all of Monday, Tuesday, and 7.3 hours on Wednesday (assuming the work is begun at the first of the week). As the week is nearly over, it is deemed unwise to attempt to collect data from one of the more distant counties, so nearby Garfield county is selected next. Table 12 indicates that 1.6 hours are required to drive from Payne to Garfield county, which means a gasoline cost of $1.38 and a driving wage of $2.16. Expenses enroute are dinner and hotel Wednesday and breakfast Thursday, totaling $5.00. Collecting the data in Garfield county requires 9.6 hours with a recording wage of $12.96. Expenses while there total $6.00 for one night's lodging and three meals. The return trip to Payne county requires 1.6 hours with gasoline cost at $1.38, driving wage of $2.16, and one meal at $1.00. It will be noted that the driver returns to Payne county Friday afternoon. However,

Table 13. Number of Hours and Detailed Expense Requirements for Collecting Land Transfer Data for an Eight-County Survey Covering a Four-Year Period on a Fifteen-Day Sample Basis; Payne, Choctaw, Grady, Jackson, Delaware, Latimer, Garfield, and Texas Counties, Oklahoma, 1949-1952

| | Hours | | Expenses | | | | |
|---|---|---|---|---|---|---|---|
| | : Rec. | : Driv. | : Rec. | : Driv. | : Gas. | : Hotel: | |
| Counties | : Hours | : Hours | : Wages | : Wages | : Expense | : Cost | : Meals |
| | Hours | | | Dollars | | | |
| Payne | 23.3 | | 31.45 | | | | |
| Payne-Garfield | | 1.6 | | 2.16 | 1.38 | 3.00 | 2.00 |
| Garfield | 9.6 | | 12.96 | | | 3.00 | 3.00 |
| Garfield-Payne | | 1.6 | | 2.16 | 1.38 | | 1.00 |
| Payne-Delaware | | 4.0 | | 5.40 | 3.39 | | 1.00 |
| Delaware | 31.5 | | 42.53 | | | 12.00 | 11.00 |
| Delaware-Payne | | 4.0 | | 5.40 | 3.39 | | 1.00 |
| Payne-Latimer | | 4.7 | | 6.35 | 4.02 | | 1.00 |
| Latimer | 15.5 | | 20.92 | | | 6.00 | 6.00 |
| Latimer-Choctaw | | 2.3 | | 3.11 | 1.92 | | |
| Choctaw | 15.5 | | 20.92 | | | 6.00 | 6.00 |
| Choctaw-Payne | | 6.0 | | 8.10 | 5.16 | 3.00 | 2.00 |
| Payne-Choctaw | | 6.0 | | 8.10 | 5.16 | | 1.00 |
| Choctaw | 15.1 | | 20.39 | | | 6.00 | 6.00 |
| Choctaw-Grady | | 4.8 | | 6.48 | 4.08 | 3.00 | 2.00 |
| Grady | 15.3 | | 20.66 | | | 6.00 | 6.00 |
| Grady-Payne | | 2.8 | | 3.78 | 2.37 | | |
| Payne-Grady | | 2.8 | | 3.78 | 2.37 | | |
| Grady | 11.6 | | 15.66 | | | 3.00 | 4.00 |
| Grady-Jackson | | 2.8 | | 3.78 | 2.37 | 3.00 | 2.00 |
| Jackson | 12.5 | | 16.88 | | | 3.00 | 4.00 |
| Jackson-Payne | | 5.5 | | 7.43 | 4.74 | 3.00 | 2.00 |
| Payne-Texas | | 7.4 | | 9.99 | 6.33 | | 1.00 |
| Texas | 7.1 | | 9.58 | | | 3.00 | 3.00 |
| Texas-Payne | | 7.4 | | 9.99 | 6.33 | 3.00 | 3.00 |
| Total | 157.0 | 63.7 | 211.95 | 86.01 | 54.39 | 66.00 | 68.00 |

no wages or expenses are allowed while in Payne county as it is assumed that the enumerator has other duties which he might perform and there-fore this time and expense should not be allocated to the collection of land transfer data.

At the beginning of the following week the enumerator drives to Delaware county, taking four hours for the trip with a driving wage of $5.40 and a gasoline cost of $3.39 plus $1.00 for lunch. No expense was allowed for breakfast as it is assumed that the enumerator eats breakfast at his own expense while in Payne county before departing. Collecting the data in Delaware county requires 31.5 hours (recording wage of $42.53) plus $12.00 for three nights' lodging and $11.00 for meals. The return trip to Payne county requires four hours and one meal plus expenses the same as the trip from Payne to Delaware. Again the enumerator returns to Payne county before the end of the week but, as outlined previously, no wages or expenses are paid him after his arrival home.

At the beginning of the third week the enumerator drives to Latimer county. The trip requires 4.7 hours and expenses include $6.35 for driving wages, $4.02 for gasoline, and $1.00 for lunch. Collecting the data for Latimer county takes 15.5 hours during which $20.92 must be spent for recording wages and $12.00 for hotel and meals. After Latimer is completed the enumerator moves to Choctaw county, the trip taking 2.3 hours at a cost of $1.92 for gasoline and $3.11 for driving wages. To complete the data at Choctaw county

would require 30.6 hours. However, as the week is practically over, the enumerator is able to complete only 15.5 hours of the work before having to return to Payne county. The 15.5 hours requires $20.92 recording wages plus $12.00 food and lodging, and the trip to Payne requires an outlay of $8.10 for wages, $5.16 for gasoline, and $5.00 for food and lodging. It should be noted that no expense is allowed for a noon meal Saturday as it is assumed that the enumerator will eat at his own expense after his return to Payne county.

The following week the enumerator returns to Choctaw county, completing the work in 15.1 hours at a recording wage of $20.39 plus $6.00 for hotel and $6.00 for meals. The enumerator then spends 4.8 hours driving from Choctaw to Grady county. The trip involves $6.48 for wages, $4.08 for gasoline, and $5.00 for food and lodging. The collection of data for Grady county would require 26.9 hours but, as was the case in Choctaw county, the enumerator is able to complete only a part of the work before returning home at the end of the week. In this case he completes 15.3 hours of the work at Grady with expenses of $20.66 for recording wages and $12.00 for six meals and a hotel room for two nights. The trip from Grady to Payne takes 2.8 hours with $3.78 for driving wages and $2.37 for gasoline.

At the beginning of the next week the enumerator returns to Grady county (2.8 hours) and completes the work there in 11.6 recording hours at a recording wage of $15.66 and expenses for food and lodging of $7.00. The next county to be collected is Jackson

county, the drive there from Grady taking 2.8 hours with driving wages being $3.78 and gasoline expense at $2.37. As the workday is over during the interval taken up by the trip, expenses totaling $5.00 must be included for a hotel room and two meals. Recording the Jackson county data takes 12.5 hours at a recording wage of $16.88. Expenses for this period come to $7.00 for food and lodging. The trip from Jackson back to Payne requires 5.5 hours, expenses being $7.43 for driving salary, $4.74 for gasoline, $3.00 for hotel, and $2.00 for meals. This week presents a situation similar to the first and second weeks wherein the enumerator returns to Payne county before the week is over but, again, no wages or expenses are allotted to the cost of acquiring the data while the enumerator is at home.

At the beginning of the next week the enumerator drives to Texas county, which is the last one included in the survey. The trip takes 7.4 hours, entailing an outlay of $9.99 for driving wages, $6.33 for gasoline cost, and $1.00 for meals. Collecting the data takes 7.1 hours with recording salary payments amounting to $9.58 plus payments of $3.00 for hotel and $3.00 for meals. The return trip to Payne county again requires 7.4 hours and the driving wage and gasoline cost are again $9.99 and $6.33 respectively, but, as the trip back covers a time span requiring three meals and one night's stay in a hotel, allowances of $6.00 must be made.

After the survey is completed it is possible to total all of the expense and time outlays to determine how much time is involved in

driving and how much time is involved in actually recording the deeds, and also the total cost and a breakdown of the total cost into sub-totals of each integral expense. The totals in Table 13 show that 220.7 hours are required to collect the data; 157.0 hours of these being spent recording the deeds and 63.7 hours taken up by driving from county to county. The total cost of the survey is $486.35; $211.95 being spent for the salary of the enumerator while recording, $86.01 being the enumerator's driving wage, $54.39 going for gasoline, and $134.00 for food and lodging.

### Fifteen-Day Sample vs. Complete Enumeration

Table 14 presents a comparison of the total cost required for a complete enumeration and for a fifteen-day sample of each of the surveys considered in this study and shows the difference in cost between the two and the percentage of the total complete enumeration cost which is saved by utilization of the sample.[2] Similar comparisons of recording hours, driving hours, total hours, recording wages, driving wages, gasoline expenses, and food and lodging costs are found in Appendix Tables 1 to 7.

A large amount of data as presented in Table 14 is a useful and necessary tool for making analyses but often impedes a clear, easily understood presentation of conclusions. Thus, reliance henceforth is mainly upon the use of charts rather than tables for illustrating the

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[2]The term "total cost" includes all expenditures necessary to collect the data but does not include expenditures required for processing or analyzing the data.

Table 14.  Comparison of Enumeration Cost Required for Fifteen-Day
Sample and for Complete Enumeration Studies; Payne, Choctaw,
Grady, Jackson, Delaware, Latimer, Garfield, and Texas
Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | Four Years | Three Years | Two Years | Annual | Semi-Annual | Quarter |
| | Dollars | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 804.96 | 581.45 | 426.53 | 264.99 | 185.60 | 149.92 |
| Fifteen-Day Sample | 486.35 | 397.24 | 292.05 | 195.73 | 150.68 | --- |
| Difference | 318.61 | 184.21 | 134.48 | 69.26 | 34.92 | --- |
| Percent Saved by Sample | 39.6 | 31.7 | 31.5 | 26.1 | 18.8 | --- |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 554.96 | 432.47 | 287.17 | 165.65 | 115.84 | 89.71 |
| Fifteen-Day Sample | 366.54 | 272.97 | 179.18 | 118.40 | 90.39 | --- |
| Difference | 188.42 | 159.50 | 107.99 | 47.25 | 25.45 | --- |
| Percent Saved by Sample | 34.0 | 36.9 | 37.6 | 28.5 | 22.0 | --- |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 412.86 | 314.36 | 242.13 | 135.94 | 93.46 | 77.07 |
| Fifteen-Day Sample | 284.92 | 202.53 | 149.49 | 94.68 | 77.07 | --- |
| Difference | 127.94 | 111.83 | 92.64 | 41.26 | 16.39 | --- |
| Percent Saved by Sample | 31.0 | 35.6 | 38.3 | 30.4 | 17.5 | --- |

findings of this section.

Figure 9 indicates that in every instance the dollar saving in total cost prompted by use of the sample is greater within time periods (four-year surveys, three-year surveys, etc.) for the eight-county over the six-county and for the six-county over the four-county. A clarification of this is that the saving in an eight-county, four-year survey is greater than the saving in a six-county, four-year survey, and the savings in both are greater than the saving in a four-county, four-year survey. It should be noted that the slope of the curve downward and to the right is not consistent throughout, emphasizing the point that the savings encountered in the four-county, four-year survey are less than the eight-county, three-year savings and that the four-county, three-year savings are less than the eight-county, two-year savings.

Figure 10 presents another comparison pertaining to the total dollar cost saved: the saving within survey size groups (eight-county, six-county, four-county) being greater in each instance as the number of years included in the survey increases. Thus, the savings in the eight-county, four-year survey are greater than the eight-county, three-year; savings in both are greater than the eight-county, two-year; the eight-county, one-year savings are still less; and all of the preceding are greater than the eight-county, semi-annual savings. As was similarly the case in Figure 9, the total savings increase between the eight-county, semi-annual and the six-county, four-year and between the

Figure 9. Total Number of Dollars Saved by Utilization of the Fifteen-Day Sample Technique, Four-, Six-, and Eight-County Surveys, Oklahoma, 1949-1952
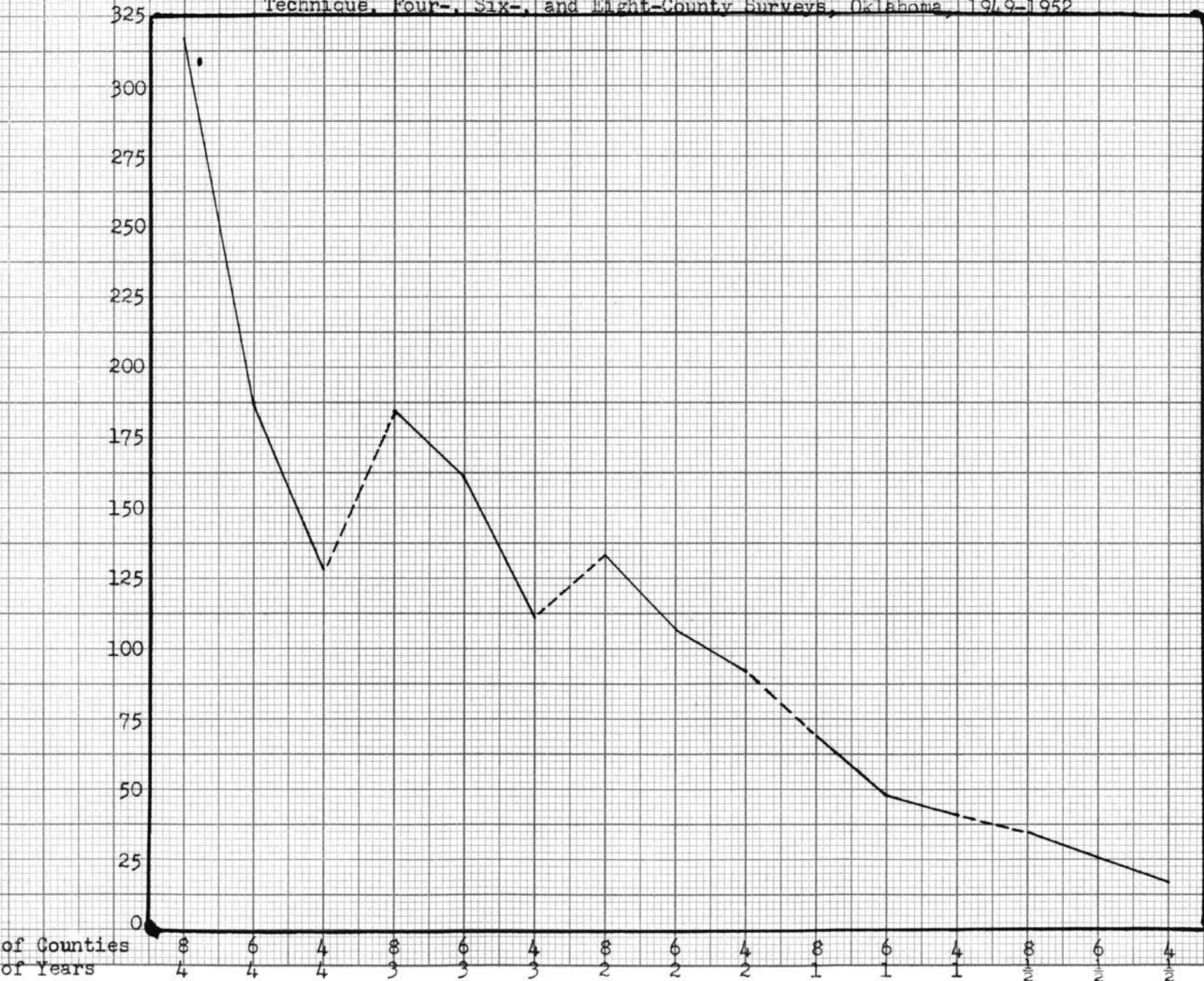
Source: See Table 14.

Figure 10. Total Number of Dollars Saved by Utilization of the Fifteen-Day Sample Technique, Four-, Six-, and Eight-County Surveys, Oklahoma, 1949-1952
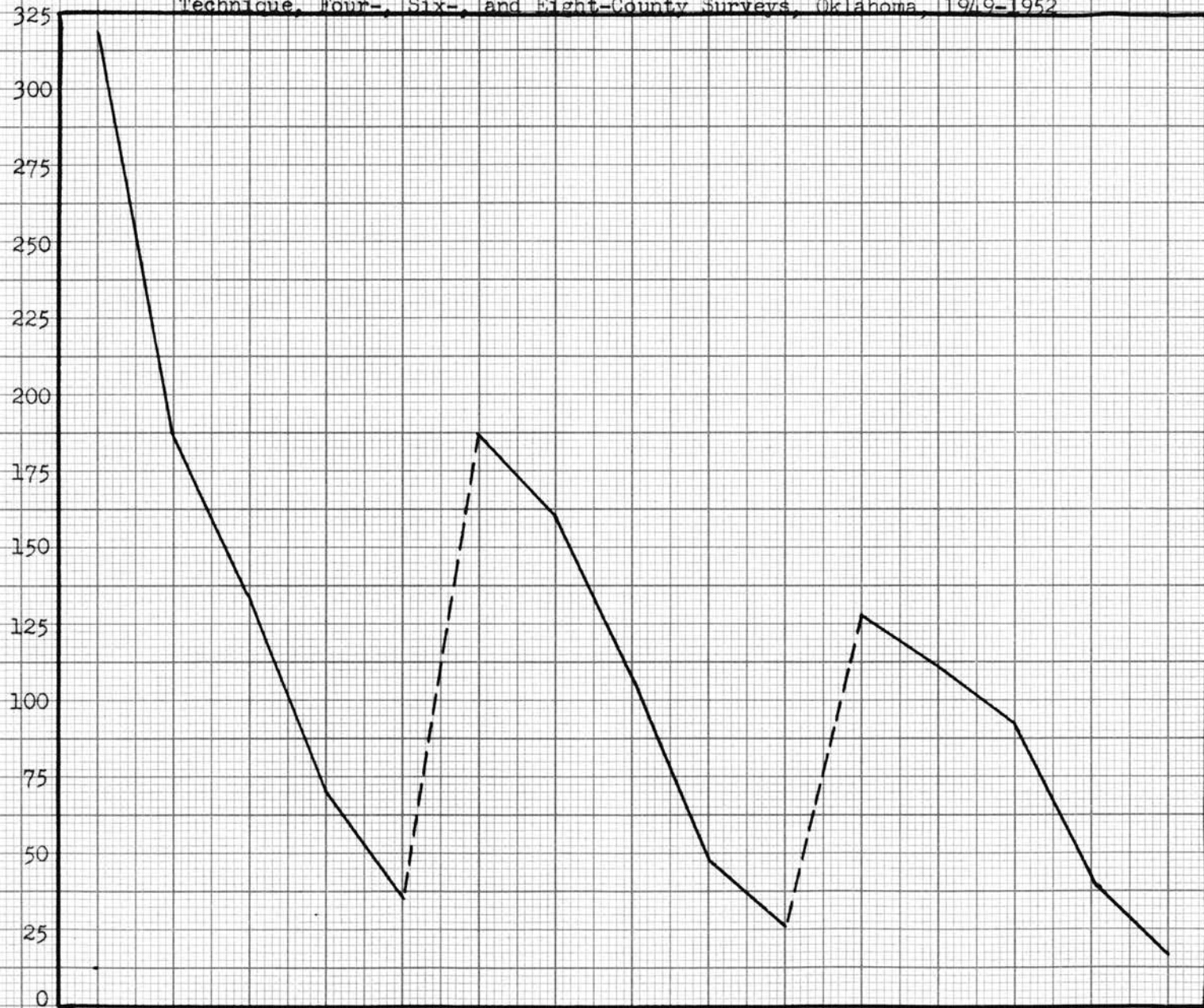
Source: See Table 14.

six-county, semi-annual and the four-county, four-year.

As applied to practical situations, Figure 9 shows that, if data for a specified period of time is to be collected, the actual dollar savings prompted by the fifteen-day sample increase as the number of counties included in the study increases. Figure 10 illustrates that the actual savings are greater when the number of years studied is increased, the number of counties being held constant.

The relation between the number of transfers and the dollars of total cost saved by use of the sample is shown in Figure 11. The types of surveys are arranged so that the number of transfers are ranked in descending order, the largest surveys toward the left and the smallest toward the right. The significance of Figure 11 is that it shows dollar reductions in total cost brought about by use of the sample increasing as the number of transfers increase. One exception to this statement is that as the number of transfers increases from the six-county, three-year survey to the four-county, four-year survey, the saving shows a decrease. The similarity in the slopes of the three lines indicates a rather close relationship between the dollars saved and the number of transfers and, excepting the one deviation, the implication is that a greater saving can be expected from surveys containing a larger number of transfers. The reader should be warned not to attach any significance to the fact that, except for the four-county, four-year survey, the dollars saved line is always above the complete enumeration number of transfers line. This is attributable only to chance as one scale on

Figure 11. Relation Between Total Number of Dollars Saved and Number of Transfers Included in Survey, Four-, Six-, and Eight-County Surveys, Oklahoma, 1949-1952
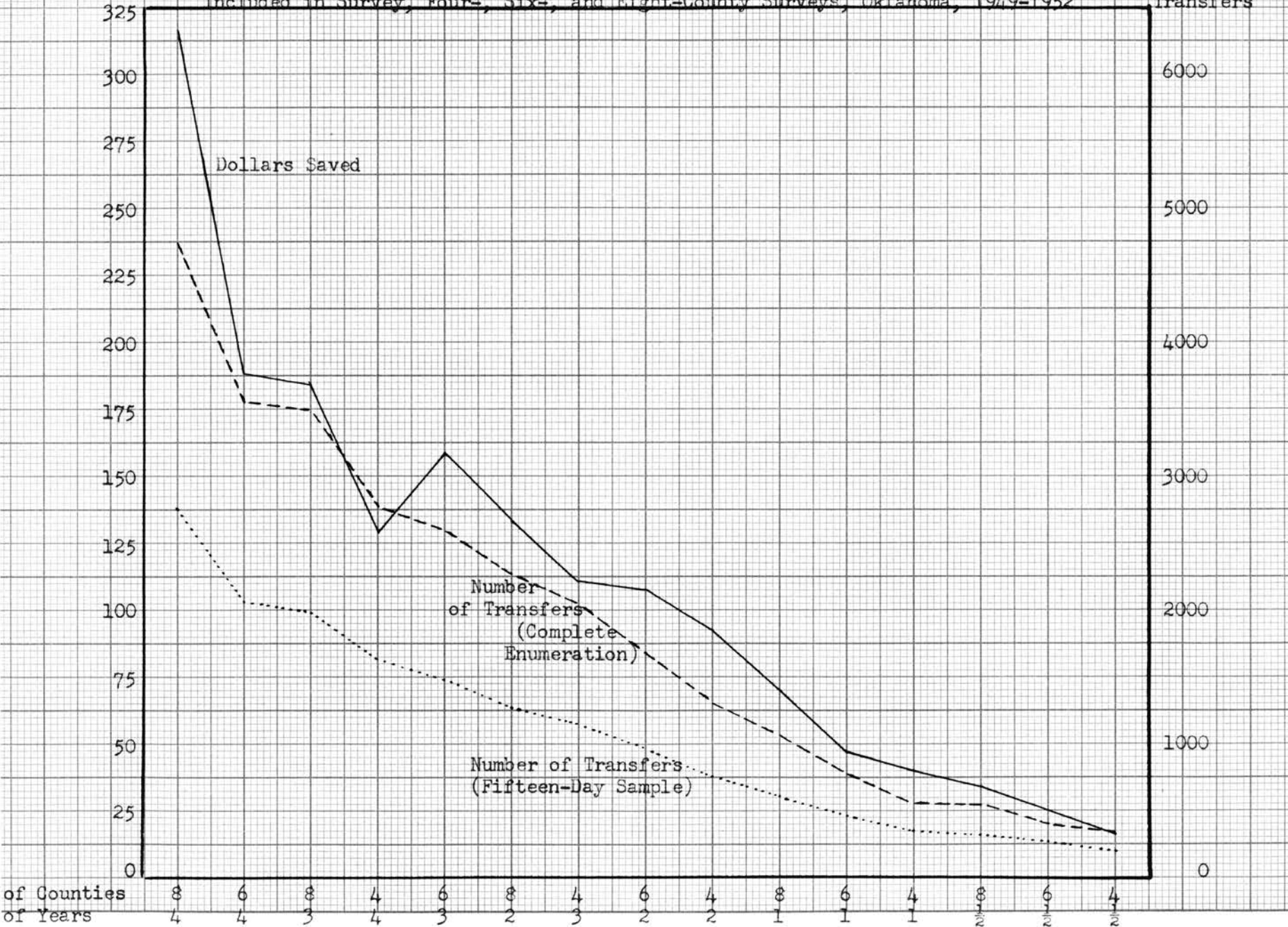
the left of the graph is used to indicate dollars and a separate scale on the right indicates number of transfers.

Figure 12 compares the percent of the total cost saved with the percent reduction in the number of transfers. Such a comparison shows in this case that the percentage reductions in the number of transfers are always greater than the percentage reductions in total cost. Thus, in an eight-county, four-year survey the fifteen-day sample reduces the number of transfers which must be collected by 42.4 percent. It might be assumed that such a reduction in the number of transfers would result in a corresponding percentage reduction in total cost. As shown in Figure 12, however, the reduction in total cost for the eight-county, four-year survey is only 39.6 percent which illustrates, as in the other types of surveys, that the direct effect of the sample technique (the percentage reduction in the number of transfers) is always greater than the percentage reduction in total cost.

Table 15 lists all possible survey combinations which have been studied under categories representing possible budget allowances. The surveys are arranged in an ascending order according to the total costs of conducting the survey: the most inexpensive survey being at the top of each column and the costliest being at the bottom. This table indicates the choices which a project leader has in determining which type of survey may be made within the limitations of available funds. If the project leader has, for example, $401 to $500 at his disposal and wishes to spend that amount for the purpose of gathering data for land market

Figure 12. Comparison of Percentage Reduction in Total Cost and Percentage Reduction in Number of Transfers Brought About by Utilization of the Fifteen-Day Sample Technique, Four-, Six-, and Eight-County Surveys, Oklahoma, 1949-1952

## Table 15. Types of Surveys Which May be Made Under Various Budget Categories; Payne, Choctaw, Grady, Jackson, Delaware, Latimer, Garfield, and Texas Counties, Oklahoma, 1949-1952

| Less than $100 | | | $101 to $200 | | | $201 to $300 | | | $301 to $400 | | | $401 to $500 | | | $501 to $600 | | | $601 to $700 | | | $701 to $800 | | | $801 to $900 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | Y | E | C | Y | E | C | Y | E | C | Y | E | C | Y | E | C | Y | E | C | Y | E | C | Y | E | C | Y | E |
| 4 | 1/4 | CE | 6 | 1/2 | CE | 4 | 3 | S | 4 | 3 | CE | 4 | 4 | CE | 6 | 4 | CE | | | | | | | 8 | 4 | CE |
| 4 | 1/2 | S | 6 | 1 | S | 4 | 2 | CE | 6 | 4 | S | 8 | 2 | CE | 8 | 3 | CE | | | | | | | | | |
| 6 | 1/4 | CE | 4 | 1 | CE | 8 | 1 | CE | 8 | 3 | S | 6 | 3 | CE | | | | | | | | | | | | |
| 6 | 1/2 | S | 4 | 2 | S | 6 | 3 | S | | | | 8 | 4 | S | | | | | | | | | | | | |
| 4 | 1/2 | CE | 8 | 1/4 | CE | 4 | 4 | S | | | | | | | | | | | | | | | | | | |
| 4 | 1 | S | 8 | 1/2 | S | 6 | 2 | CE | | | | | | | | | | | | | | | | | | |
| | | | 6 | 1 | CE | 8 | 2 | S | | | | | | | | | | | | | | | | | | |
| | | | 6 | 2 | S | | | | | | | | | | | | | | | | | | | | | |
| | | | 8 | 1/2 | CE | | | | | | | | | | | | | | | | | | | | | |
| | | | 8 | 1 | S | | | | | | | | | | | | | | | | | | | | | |

Note: Column C denotes the number of counties included in the survey. Hence, the figure "4" under column C means a four-county survey.

Column Y denotes the number of years included in the survey. Hence, "1/4" under column Y means one survey covering a time interval of 1/4 of a year.

Column E denotes the type of enumeration. "CE" means a complete enumeration and "S" means a fifteen-day sample.

These surveys are arranged in ascending order according to total cost. The horizontal bars indicate the midpoints in the ranges of each category; i.e., in the $101 to $200 category the bar shows that those surveys above the bar cost between $101 and $150. Those below the bar cost between $151 and $200.

research he may conduct a four-county, four-year complete enumeration, a six-county, three-year complete enumeration, or an eight-county, four-year sample survey. By utilizing the horizontal bar in the graph it is seen that the first three surveys cost between $401 and $450 whereas the cost of the last survey is greater than $450 but less than $500.

### Processing the Data

Up to this point this chapter has been concerned only with the cost and time required to collect the data from the offices of the county clerks and no mention has been made of the cost and time required to process the data. It might be reasoned that since the fifteen-day sample reduces the number of transfers it will also reduce the processing requirements. However, it is believed that the cost and time savings, if any, of processing the data are small and relatively insignificant for all except very large surveys.

In order to properly appraise the expected differences in summarization costs and time it is necessary to understand the various steps required to convert the raw data into finished summarizations. The following steps are suggested for arriving at summary estimates of land prices and number of transfers:

1. Copy the number of acres and the consideration from each survey card on to a summary sheet by county and by time interval (example: one summary sheet for Payne county, 1951).
2. Total the number of acres, the considerations, and the number of transfers for each sheet.
3. Divide the total consideration by the total number of acres in order to get the average price per acre.

4. If a sample is used, adjust the sample number of transfers to comparability with the full time period.

Utilization of the sample makes possible a certain amount of savings in the first two of the above stages. However, the adjusting of the sample number of transfers described in the fourth stage is an additional requirement which is not necessary for non-sample computations and for surveys having a small number of transfers it may balance out the time saved in the first two stages.

As a general recommendation not based upon any empirical studies it is urged that the possibility of clerical processing savings should not influence the decision between sample and non-sample surveys unless the sample reduces the number of transfers by at least 1,000. Such a reduction would then make possible processing savings of significant size to be an influencing factor in favor of the sampling technique.

## Conclusions

1. When the number of years included in the survey is held constant, the amount of saving in total cost brought about by use of the sample increases as the number of counties is increased. Thus, the savings for an eight-county, four-year survey are greater than the savings for an eight-county, three-year survey.

2. When the number of counties is held constant, the amount of saving in total cost increases as the number of years is increased; meaning that savings for an eight-county, four-year survey are greater than savings for a six-county, four-year survey.

3. Generally, the amount of savings in total cost increases as the number of transfers increases.

4. In every case the percentage saving in total cost is less than the percentage decrease in the number of transfers brought about by utilization of the sample. For the eight-county, four-year survey the fifteen-day sample reduces the number of transfers by 42.4 percent. The reduction in total cost, however, is only 39.6 percent.

5. The sample technique enables the researcher to have a wider choice as to what types of surveys may be made within budget limitations.

# CHAPTER V

## SUMMARY AND CONCLUSIONS

The primary objective of this study is to present specific evidence of costsof various sizes of sample and non-sample enumerations in order to provide a breakdown of the various types of surveys which may be selected from different sized budgets or from a given budget. Other aspects of land market research which were investigated are: the reliability of sample estimates based on date of sale as compared to date of recording the instrument and the reliability of selected formulae for estimating considerations based on federal revenue stamps. These two subordinate aspects were included to determine if improved techniques of farm land market research could be achieved.

Tests on the reliability of sample estimates based on date of sale as compared to the date of recording the instrument showed that there was no significant difference between the two for estimations of land values and transfers. Thus, a sample based upon the date of recording is as reliable an indicator of farm land market conditions as is a sample based upon the date of sale.

The next portion of the study dealt with the reliability of selected formulae for estimating cash considerations based on federal revenue stamps. This chapter investigated the reliability of the following three formulae: (1) assign the last $.55 revenue stamp a value equal to its mid-value, (2) assign the last $.55 revenue stamp a value equal to its

full-value of $500, and (3) value the last $.55 revenue stamp at $350

for transfers showing revenue of $.55 to $2.20, $400 for revenues be-

tween $2.75 and $7.15, and $450 for revenues of $7.70 and more. For

the Oklahoma counties investigated the mid-value estimations were

found to be more reliable for smaller considerations and, hence, should

be used in preference to the full-value estimations when the survey con-

tains mostly small considerations. For large considerations the full-

value estimations were found to be more accurate. It is recommended

that they be used in preference to the mid-value estimations when the

survey contains mostly large considerations. The third formula was

found to be more accurate than either the mid-value or the full-value

estimations for all sizes of considerations in the Oklahoma counties in-

vestigated. This formula has the disadvantage of being somewhat com-

plex but, if this increased complexity is not considered as being pro-

hibitive, it is the most desirable of the three formulae because of its

greater accuracy.

The analysis of the comparative costs of the fifteen-day sampling

technique and the complete enumeration technique revealed that the

fifteen-day sample definitely does offer significant savings in the cost

of collecting data on land values and transfers with the most significant

savings being found in surveys covering two years or more. The largest

saving was $318.61 for the eight-county, four-year survey and this

saving represented 39.6 percent of the cost of a complete enumeration.

The sampling technique offers a much wider choice of the type of survey

which may be made than is possible with only the complete enumeration technique.

As a general rule, it may be said that the principal contribution of the sampling technique to farm land market research is to make possible an increase in the size and scope of land market studies for two significant aspects: prices and transfers. For studies in which the amount of available funds is restricted, the sample makes possible either an increase in the number of counties or an increase in the number of years studied. Although utilization of sampling is dependent upon the character and requirements of the survey being made, knowledge that the sample is reliable, practical, and offers significant monetary savings permits an expansion of farm land market research and a consequent improvement in this service to agriculture.

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Appendix Table 1. Comparison of Recording Hours Required for
Fifteen-Day Sample and for Complete Enumeration
Studies; Payne, Choctaw, Grady, Jackson,
Delaware, Latimer, Garfield and Texas
Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | Four Years | Three Years | Two Years | Annual | Semi-Annual | Quarter |
| | | | | Hours | | |

### Eight-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 272.4 | 200.7 | 129.5 | 62.0 | 32.8 | 18.3 |
| Fifteen-Day Sample | 157.0 | 113.2 | 74.1 | 36.5 | 19.6 | --- |
| Difference | 115.4 | 87.5 | 55.4 | 25.5 | 13.2 | --- |
| Percent Saved by Sample | 42.4 | 43.6 | 42.8 | 41.1 | 40.2 | --- |

### Six-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 202.3 | 149.6 | 95.5 | 44.5 | 24.8 | 14.4 |
| Fifteen-Day Sample | 118.4 | 85.1 | 55.6 | 26.7 | 14.9 | --- |
| Difference | 83.9 | 64.5 | 39.9 | 17.8 | 9.9 | --- |
| Percent Saved by Sample | 41.5 | 43.1 | 41.8 | 40.0 | 39.9 | --- |

### Four-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 159.8 | 117.7 | 74.3 | 33.8 | 19.5 | 11.8 |
| Fifteen-Day Sample | 93.3 | 66.2 | 43.0 | 20.4 | 11.8 | --- |
| Difference | 66.5 | 51.5 | 31.3 | 13.4 | 7.7 | --- |
| Percent Saved by Sample | 41.6 | 43.8 | 42.1 | 39.6 | 39.5 | --- |

Appendix Table 2. Comparison of Driving Hours Required for Fifteen-Day Sample and for Complete Enumeration Studies; Payne Choctaw, Grady, Jackson, Delaware, Latimer, Garfield, and Texas Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
| | Four Years | Three Years | Two Years | Semi-Annual | Annual | Quarter |
|---|---|---|---|---|---|---|
| | Hours | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 97.6 | 69.2 | 61.6 | 47.3 | 41.9 | 39.6 |
| Fifteen-Day Sample | 63.7 | 61.9 | 51.3 | 42.0 | 39.6 | --- |
| Difference | 33.9 | 7.3 | 10.3 | 5.3 | 2.3 | --- |
| Percent Saved by Sample | 34.7 | 10.5 | 16.7 | 11.2 | 5.5 | --- |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 59.3 | 52.8 | 38.2 | 26.6 | 23.3 | 21.0 |
| Fifteen-Day Sample | 47.9 | 38.6 | 25.0 | 23.3 | 21.0 | --- |
| Difference | 11.4 | 14.2 | 13.2 | 3.3 | 2.3 | --- |
| Percent Saved by Sample | 19.2 | 26.9 | 34.5 | 12.4 | 9.9 | --- |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 42.4 | 34.2 | 36.6 | 24.6 | 19.1 | 19.1 |
| Fifteen-Day Sample | 36.7 | 28.6 | 24.7 | 19.1 | 19.1 | --- |
| Difference | 5.5 | 5.6 | 11.9 | 5.5 | --- | --- |
| Percent Saved by Sample | 13.0 | 16.4 | 32.5 | 22.4 | --- | --- |

Appendix Table 3. Comparison of Total Enumeration Hours Required
for Fifteen-Day Sample and for Complete Enumeration Studies;
Payne, Choctaw, Grady, Jackson, Delaware, Latimer,
Garfield, and Texas Counties, Oklahoma, 1949-1952*

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | : Four : Years | :Three : Years | : Two : Years | : : Annual | : Semi- : ; Annual | : :Quarter |
| | Hours | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 370.0 | 269.9 | 191.1 | 109.3 | 74.7 | 57.9 |
| Fifteen-Day Sample | 220.7 | 175.1 | 125.4 | 78.5 | 59.2 | --- |
| Difference | 149.3 | 94.8 | 65.7 | 30.8 | 15.5 | --- |
| Percent Saved by Sample | 40.4 | 35.1 | 34.4 | 28.2 | 20.7 | --- |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 261.6 | 202.4 | 133.7 | 71.1 | 48.1 | 35.4 |
| Fifteen-Day Sample | 166.3 | 123.7 | 80.6 | 50.0 | 35.9 | --- |
| Difference | 95.3 | 78.7 | 53.1 | 21.1 | 12.2 | --- |
| Percent Saved by Sample | 36.4 | 38.9 | 39.7 | 29.7 | 25.4 | --- |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 202.0 | 151.9 | 110.9 | 58.4 | 38.6 | 30.9 |
| Fifteen-Day Sample | 130.0 | 94.8 | 67.7 | 39.5 | 30.9 | --- |
| Difference | 72.0 | 57.1 | 43.2 | 18.9 | 7.7 | --- |
| Percent Saved by Sample | 35.6 | 37.6 | 39.0 | 32.4 | 19.9 | --- |

*Total enumeration hours include recording and driving hours.

Appendix Table 4.  Comparison of Recording Wages Required for
Fifteen-Day Sample and for Complete Enumeration Studies;
Payne, Choctaw, Grady, Jackson, Delaware, Latimer,
G arfield, and Texas Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| : | : Four : Years | :Three :Years | : Two :Years | : :Annual | :Semi- :Annual | : :Quarter |
| | | | Dollars | | | |

### Eight-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 367.74 | 270.94 | 174.82 | 83.70 | 44.28 | 24.70 |
| Fifteen-Day Sample | 211.95 | 152.82 | 100.04 | 49.28 | 26.46 | --- |
| Difference | 155.79 | 118.12 | 74.78 | 34.42 | 17.82 | --- |
| Percent Saved by Sample | 42.4 | 43.6 | 42.8 | 41.1 | 40.2 | --- |

### Six-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 273.10 | 201.96 | 128.92 | 60.08 | 33.48 | 19.44 |
| Fifteen-Day Sample | 159.84 | 114.88 | 75.06 | 36.04 | 20.12 | --- |
| Difference | 113.26 | 87.08 | 53.86 | 24.04 | 13.36 | --- |
| Percent Saved by Sample | 41.5 | 43.1 | 41.8 | 40.0 | 39.9 | --- |

### Four-County Survey

| | | | | | | |
|---|---|---|---|---|---|---|
| Complete Enumeration | 215.73 | 158.90 | 100.30 | 45.63 | 26.32 | 15.93 |
| Fifteen-Day Sample | 125.96 | 89.37 | 58.05 | 27.54 | 15.93 | --- |
| Difference | 89.77 | 69.53 | 42.25 | 18.09 | 10.39 | --- |
| Percent Saved by Sample | 41.6 | 43.8 | 42.1 | 39.6 | 39.5 | --- |

Appendix Table 5.  Comparison of Driving Wages Required for Fifteen-
Day Sample and for Complete Enumeration Studies; Payne,
Choctaw, Grady, Jackson, Delaware, Latimer,
Garfield, and Texas Counties, Oklahoma,
1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | Four Years | Three Years | Two Years | Annual | Semi-Annual | Quarter |
| | Dollars | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 131.79 | 93.44 | 83.18 | 63.88 | 56.59 | 53.47 |
| Fifteen-Day Sample | 86.01 | 83.59 | 69.24 | 56.72 | 53.47 | -•• |
| Difference | 45.78 | 9.85 | 13.94 | 7.16 | 3.12 | -•• |
| Percent Saved by Sample | 34.7 | 10.5 | 16.7 | 11.2 | 5.5 | -•• |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 80.07 | 71.30 | 51.58 | 35.92 | 31.47 | 28.36 |
| Fifteen-Day Sample | 64.69 | 52.12 | 33.76 | 31.47 | 28.36 | -•• |
| Difference | 15.38 | 19.19 | 17.82 | 4.45 | 3.11 | -•• |
| Percent Saved by Sample | 19.2 | 26.9 | 34.5 | 12.4 | 9.9 | -•• |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 56.98 | 46.18 | 49.42 | 33.22 | 25.79 | 25.79 |
| Fifteen-Day Sample | 49.55 | 38.62 | 33.35 | 25.79 | 25.79 | -•• |
| Difference | 7.43 | 7.56 | 16.07 | 7.43 | -•• | -•• |
| Percent Saved by Sample | 13.0 | 16.4 | 32.5 | 22.4 | -•• | -•• |

Appendix Table 6.   Comparison of Gasoline Expenses Required for
Fifteen-Day Sample and for Complete Enumeration Studies;
Payne, Choctaw, Grady, Jackson, Delaware, Latimer,
Garfield, and Texas Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | Four Years | Three Years | Two Years | Annual | Semi- Annual | Quarter |
| | Dollars | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 83.43 | 59.07 | 52.53 | 40.41 | 35.73 | 33.75 |
| Fifteen-Day Sample | 54.39 | 52.83 | 43.77 | 35.73 | 33.75 | -•• |
| Difference | 29.04 | 6.24 | 8.76 | 4.68 | 1.98 | -•- |
| Percent Saved by Sample | 34.8 | 10.6 | 16.7 | 11.6 | 5.5 | |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 50.79 | 45.21 | 32.67 | 22.65 | 19.89 | 17.91 |
| Fifteen-Day Sample | 41.01 | 32.97 | 21.36 | 19.89 | 17.91 | -•• |
| Difference | 9.78 | 12.24 | 11.31 | 2.76 | 1.98 | -•• |
| Percent Saved by Sample | 19.2 | 27.1 | 34.6 | 12.2 | 10.0 | -•- |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 36.15 | 29.28 | 31.41 | 21.09 | 16.35 | 16.35 |
| Fifteen-Day Sample | 31.41 | 24.54 | 21.09 | 16.35 | 16.35 | -•• |
| Difference | 4.74 | 4.74 | 10.32 | 4.74 | -•• | -•- |
| Percent Saved by Sample | 13.1 | 16.2 | 32.8 | 22.5 | -•• | --• |

Appendix Table 7.  Comparison of Food and Lodging Costs Required
for Fifteen-Day Sample and for Complete Enumeration Studies;
Payne, Choctaw, Grady, Jackson, Delaware, Latimer,
Garfield, and Texas Counties, Oklahoma, 1949-1952

| | Number of Years | | | | | |
|---|---|---|---|---|---|---|
| | Four Years | Three Years | Two Years | Annual | Semi-Annual | Quarter |
| | Dollars | | | | | |
| **Eight-County Survey** | | | | | | |
| Complete Enumeration | 222.00 | 158.00 | 116.00 | 77.00 | 49.00 | 38.00 |
| Fifteen-Day Sample | 134.00 | 108.00 | 79.00 | 54.00 | 37.00 | --- |
| Difference | 88.00 | 50.00 | 37.00 | 23.00 | 12.00 | --- |
| Percent Saved by Sample | 39.6 | 31.6 | 31.9 | 29.9 | 24.5 | --- |
| **Six-County Survey** | | | | | | |
| Complete Enumeration | 151.00 | 114.00 | 74.00 | 47.00 | 31.00 | 24.00 |
| Fifteen-Day Sample | 101.00 | 73.00 | 49.00 | 31.00 | 24.00 | --- |
| Difference | 50.00 | 41.00 | 25.00 | 16.00 | 7.00 | --- |
| Percent Saved by Sample | 33.1 | 36.0 | 33.8 | 34.0 | 22.6 | |
| **Four-County Survey** | | | | | | |
| Complete Enumeration | 104.00 | 80.00 | 61.00 | 36.00 | 25.00 | 19.00 |
| Fifteen-Day Sample | 78.00 | 50.00 | 37.00 | 25.00 | 19.00 | --- |
| Difference | 26.00 | 30.00 | 24.00 | 11.00 | 6.00 | --- |
| Percent Saved by Sample | 25.0 | 37.5 | 39.3 | 30.6 | 24.0 | --- |

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