

THE ECONOMIC BASE THEORY, AND ITS
APPLICATION TO THE CITY OF
STILLWATER, OKLAHOMA

By

DOROTHY LOUISE OCHSNER

Bachelor of Business Administration

The University of Oklahoma

Norman, Oklahoma

1959

Submitted to the faculty of the Graduate
School of the
Oklahoma State University
in partial fulfillment of the requirements
for the degree of
MASTER OF SCIENCE
August, 1963

JAN 8 1964

THE ECONOMIC BASE THEORY AND ITS
APPLICATION TO THE CITY OF
STILLWATER, OKLAHOMA

Thesis Approved:

Richard W. Poole

Thesis Adviser

W. J. Frenston

Louis Neuhoff

Dean of the Graduate School

542109

PREFACE

Increases in urban population and in the emphasis on urban development have increased the need for understanding the workings of urban economies. One approach to studying the economies of urban areas is provided by the economic base theory. The premise of the economic base theory is that a city supports itself by earning income from outside its area.

This thesis describes the base theory and some of its limitations and applies the base approach to Stillwater, Oklahoma. The Stillwater economy is analyzed in terms of its income-creating activities, which are identified and measured by indirect techniques.

The author gratefully acknowledges her indebtedness to the thesis committee, particularly Dr. Richard Poole, Dr. Julian Bradsher, and Dr. R. W. Trenton, who took time from busy schedules to give valuable assistance. Appreciation is also expressed to Ralph Ochsner for his advice as to the problems and needs of urban planners for particular economic information, and for his help in editing the thesis copy.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	1
The Urban Economic Base Concept	2
Purpose of this Study	4
Plan of Presentation.	5
II. A SUMMARY OF THE LITERATURE CONCERNING THE ECONOMIC BASE	6
Delimiting the Base Area.	6
Measuring the Base.	7
Applying the Base Ratios.	20
Adjusting for Ratio Changes	22
Appraising the Economy.	22
III. THE STILLWATER ECONOMY	27
Base Area	27
Basic Activities.	28
Appraising the Economy.	40
The Base Ratios	49
Applying the Base Ratios.	52
Limitations of the Study.	53
IV. SUMMARY AND CONCLUSIONS.	56
Summary	56
Conclusions	57
BIBLIOGRAPHY	61

LIST OF TABLES

Table	Page
1. Percentage Distribution of Employed Persons by Industry Group, City of Stillwater, and the United States, 1960	32
2. Actual, Needed, and Basic Employment by Industry Group, Stillwater, 1960.	34
3. Basic Employment by Industry Group, Stillwater, 1960.	35
4. Service Employment by Industry Group, Stillwater, 1960.	45

CHAPTER I

INTRODUCTION

Increasing emphasis is being placed on economic development of the areas of the world. Nations are attempting to increase total production more than enough to provide for increases in population; states and cities are competing for industry in efforts to maintain or increase their shares of the nation's total income. Evidence of this desire is attested to by the many groups and institutions organized to promote economic growth.¹

Efforts to promote economic growth are directed toward increasing the employment of an area's productive resources. Self-sufficiency, not possible for most nations, is less possible for the regional components and smaller areas within nations. It is advantageous for an area to specialize in the production of those goods and services which it produces most efficiently, that is, at lowest possible cost, and to trade those goods outside its boundaries for goods produced more efficiently in other areas. The more

¹Each year 10,000 communities are vying for approximately 350 new industrial installations. (Randall T. Klemme, "Community Development as Forerunner of Industrial Development," Appraisal Journal, XXVIII [October, 1960] 444).

the activities of an area become specialized, the more dependent the area becomes on the outside.

Cities are examples of economic areas which, because of specialization, are dependent upon other areas for goods and services and for markets for their production. It is toward a better understanding of these "economies within economies"² that the urban economic base concept has been developed.

The Urban Economic Base Concept

The term "economic base" does not carry the same meaning in many of its applications.³ Used in this thesis

²Jervis J. Babb, "Problems of Local Growth and Area Development," The Little Economies, papers delivered at the Semi-Annual Meeting, Board of Trustees, Committee for Economic Development (New York, 1958), p. 9.

³Larry Smith, in "The Economic Base of the Community," Business Action for Better Cities (Washington, D.C.: Chamber of Commerce of the United States, 1952), p. 44, refers to the economic base as being the "tax or income base on which the tax revenue for any community is predicated" and as "the fundamental sources of income that may be available to the citizens in any particular community, from which they derive their livelihood . . ."

Ernest M. Fisher and Robert M. Fisher say the economic base is "the sum of all the economic activities within a community which result in the receipt of income in any form by its inhabitants." Urban Real Estate (New York: Henry Holt and Co., 1954), p. 278.

Edward K. Smith in A Guide to Economic Base Studies for Local Communities (Boston, Mass.: The Bureau of Business and Economic Research, Northeastern University, 1955), 20 pages, presents a guide for an analysis much broader than prescribed by the concept embodied in this thesis.

Andrews concludes that the economic base to many individuals means a broadscale analysis of the entire economy of the community, which he prefers to label as an "economic survey." Richard Andrews, "The Problem of Terminology," Land Economics, XXIX (August, 1953) 266-267.

is the more specialized definition recommended by writers in recent literature, particularly Richard Andrews,⁴ who defines the economic base as consisting of the export activities of a community.⁵

Urban base theorists call the proportion of the activities of an enterprise that are directed toward serving individuals, businesses and institutions existing outside the urban area "basic,"⁶ "primary,"⁷ "city-forming,"⁸ and "supporting."⁹ The activities in the area that exist primarily to serve those engaged in "basic" activities, or to serve, in other words, the inhabitants of the geographic area, are termed "non-basic,"⁶ "auxiliary,"⁷ "city-serving,"⁸

⁴A series of articles by Richard B. Andrews appears in Land Economics, Vols. XXIX-XXXII (Madison, Wisconsin: The University of Wisconsin, May, 1953 to February, 1956). The series is entitled "Mechanics of the Urban Economic Base." Each article carries the series heading and the article title. References in this thesis to articles in the series will carry the article title only.

⁵Andrews, "The Problem of Terminology," Land Economics, XXIX (August, 1953) 268.

⁶Arthur M. Weimer and Homer Hoyt, Principles of Urban Real Estate (New York: The Ronald Press Co., 1948), pp. 85-86.

⁷Robert M. Haig, Regional Survey of New York and Environs, Vol. I: Major Economic Factors in Metropolitan Growth and Arrangement (New York, 1928) p. 43.

⁸Gunnar Alexandersson, "City-forming and City-serving Production," Readings in Urban Geography, ed. Harold M. Mayer and Clyde F. Kohn (Chicago: The University of Chicago Press, 1959), pp. 110-115.

⁹Bureau of Business Research, The University of New Mexico, and Research Department, Federal Reserve Bank of Kansas City, Mo., The Economy of Albuquerque, New Mexico, 1949, p. 21.

and "service."¹⁰ As the size of the area is enlarged, it is possible that most of the activities are area-serving, or "service." For example, the aggregate of activities within a nearly self-sufficient country are directed toward serving the needs of the country's inhabitants, while in small, economically specialized areas, the economic activities are directed toward serving people outside the area.

An urban economic base study as defined herein divides an area's activities into "basic" and "service," and analyzes the economy in terms of these activities. Proponents of the economic base approach to urban economic analysis hold that, given the ratio of basic to total employment and to total population, one can predict what changes will take place in the urban economy if there is a given change in the economy's "base."

Purpose of this Study

The economic base concept was developed to serve as a short-cut approach to urban economic analysis. Urban economists and planners have need of such an approach to understanding the economies of particular urban areas. Many articles have been written on the base theory and specific aspects of the theory. A need exists, however, for a general statement of the theory and its application by individuals

¹⁰ Andrews thinks it preferable to use the terms "basic" and "service" to refer to the two large classifications of economic activities in communities ("The Problem of Terminology," Land Economics, XXIX [August, 1953] 268).

interested in performing or directing a base study.¹¹

The purpose of this thesis is to describe the theory and its limitations, and to present an example of its application to the Stillwater economy.

Plan of Presentation

First, a survey of the literature on the economic base and an outline of the procedures for performing a base study are presented in Chapter II. In Chapter III, the economic base approach is applied to the Stillwater economy. Stillwater's economic base is appraised in terms of the analysis presented. The conclusions and summary appear in Chapter IV.

¹¹A guide to economic base studies for cities is contained in The Community Economic Base Study, by Charles M. Tiebout (Supplementary Paper No. 16, [New York: The Committee for Economic Development, December, 1962], 86 pages), published after this thesis was begun. Tiebout describes a base analysis more closely reflecting what Andrews refers to as a complete economic survey. See Andrews, "The Problem of Terminology," Land Economics, XXIX (August, 1953) 266-267.

CHAPTER II

A SURVEY OF THE LITERATURE CONCERNING THE ECONOMIC BASE

Homer Hoyt developed the economic base concept to serve as a short-cut forecasting tool.¹ Since the development of the concept, economic base analysis has been both broadened and refined. Economic base studies need not be short-cut studies, but may be as broad and inclusive as time and funds permit.

Because of differences in the size and function of study areas, and in available resources for performing the studies, no standard step-by-step process is universally applicable. The following description of the base study process is, therefore, intended to be explanatory of general procedures only.

Delimiting the Base Area

Few guides to the researcher for defining the base area appear in the literature on economic base analysis.

¹Although statements appear in earlier literature to indicate that researchers were using the idea of basic and service activities, Homer Hoyt developed the present-day concept in 1936 when he was employed by the Federal Housing Authority to study housing market demand. See Andrews, "Historical Development of the Base Concept," Land Economics, XXIX (May, 1953) 163.

Andrews' statement that the urban community is an "economic . . . entity whose mechanism of productive and distributive parts is interdependent to a very high degree,"² suggests that the area should include:

1. A cluster of individuals who are interdependent because of their residence, employment, and income expenditure
2. Activities that (a) employ the above individuals paying them income, or (b) receive income from the above individuals by way of expenditures by the individuals for the goods or services provided by the activities.

The choice of a particular boundary, whether it be an established political area, such as an incorporated area, or an arbitrarily determined one, depends upon the purpose of the study and the availability of data.

Measuring the Base

The Importance of Basic Activities

The premise of the economic base theory is that basic employment supports the city. Unless the city serves needs of those living beyond its borders it cannot long continue to exist. Residents of one area need the services of other

²"The Problem of Base Area Delimitation," Land Economics, XXX (November, 1954) 317-318.

areas if they are to specialize, as was noted above.³ A frequently quoted statement of this idea is: "The residents of a city cannot support themselves by taking in their own washing."⁴

Further, the theory provides that without growth of basic employment in an urban area, there can occur no significant growth in population. Homer Hoyt, perhaps the strongest advocate of the base concept, states that "the overwhelming weight of the evidence . . . [indicates] that if there is no fresh accession of the numbers engaged in basic employment or in the dollar incomes of those engaged in basic activity, the particular urban region will thereafter grow very slowly if it grows at all."⁵ For employment in service activities to expand significantly, there must be significant expansion in the basic sources of income.

It is on its emphasis on the importance of basic activities that the economic base theory has drawn its greatest criticism.⁶ Typical statements of such criticism are:

³See the discussion of specialization and self-sufficiency, pages 1 and 2.

⁴Arthur Weimer and Homer Hoyt, Urban Real Estate (4th ed.; New York: The Ronald Press Co., 1960), p. 362.

⁵Homer Hoyt, "The Utility of the Economic Base Method in Calculating Urban Growth," Land Economics, XXXVII (February, 1961) 58.

⁶Criticisms appear in: Sue Moyerman and Britton Harris, "The Economics of the Base Study," Journal of the American Institute of Planners, XXI (1955) 88-93; R. W. Pfouts and E. T. Curtis, "Limitations of the Economic Base Analysis," Social Forces, XXXVI (May, 1958) 303-310; Britton Harris,

1. Inherency in the theory of a "mercantilistic bias"
2. Neglect by the theory of imports into the community
3. Concentration of attention of the "most important" industries.

Each of these criticisms is believed by this writer to be a result of a misinterpretation or an intended extension beyond the theory's intended use and its potential.

Referring to the accusation of a mercantilistic bias, it is not the purpose nor the desired result of base studies to devise ways of earning additional income from outside the community, or earning additional income at the expense of other communities. Rather, by identifying those activities that earn income from outside the area, one can more easily determine the effects of changes in the basic activities upon the service activities, and therefore upon the local economy. Although it is on the importance of basic activities that the theory is predicated, this is not to say that it devalues the importance of service enterprises. As stated by Hoyt, "an adequate supply of what are usually thought of as service activities may help to generate economic growth

"Comments on Pfouts's Tests of the Base Theory," Journal of the American Institute of Planners, XXIV (1958) 233-237; Morgan D. Thomas, "The Economic Base and a Region's Economy," ibid., XXIII (1957) 86-92; James Gillies and William Grigsby, "Objections of the Economic Base Theory and An Alternative Theory," ibid., XXII (1956) 17-23; Hans Blumenfeld, "The Economic Base of the Metropolis," ibid., XXI, (1955) 114-132; and Melvin L. Greenhut, "Comments on the Economic Base Theory," Land Economics, XXXV (February, 1959) 71-75.

and the lack may retard economic growth."⁷

If a community can detect or devise a competitive advantage over other communities in the production of some economic good, then it is to the advantage of the entire (national) economic community for it to produce the product. The benefits of specialization cannot accrue unless advantage of such opportunities is taken.

The finding might well result from the base study that the economic well-being of the community could be improved by increasing certain services. Such findings result also from market surveys, for which no criticism is given by those who criticize base analysis for being mercantilistic. Moreover, the locating of such enterprises would occur on the basis of a profit possibility, not on the statement of the need of such enterprises as expressed by the base study.

Not totally, if at all, does the base theory neglect the import side of the ledger, nor does it place one activity in a category of more "importance" than others. Even indirect measurements, such as that used in Chapter III, point out the degree to which the community depends upon imports for its existence.

The assignment of a degree of importance may be made by the researcher as a result of the base study, in an attempt to show to what extent the economy would be affected by a decline or an increase in some activity. Ability to make

⁷Arthur Weimer and Homer Hoyt, Urban Real Estate (4th ed., New York: The Ronald Press Co., 1960), p. 369.

such a prediction would be considered a desirable result of the analysis.

Many criticisms of the base approach, such as those discussed above, that have appeared in past years do not apply today. In recent literature⁸ economic base analysis as a system of study has been expanded, qualified, and refined. For example, it is known that basic activities, just because they serve a non-local market, may not be as important as originally assumed. One must take into account qualitative aspects of a basic enterprise--the net income it brings into the community, salary levels within the enterprise, and the dependability of income from the enterprise--as well as quantitative aspects. The effectiveness of the service activities of an area are important. Further, not only the creation of income from the outside, but the flow of spending within a community is significant.

No one statement about the set of relationships of economic activities within a community applies universally to all urban areas. The base theory is no "magical formula" that gives insight into the intricate workings of an urban economy.⁹ Such insight comes from a deep analysis of a

⁸Reference is made here to Andrews' "Urban Economics, An Appraisal of Progress," Land Economics, XXXVII (August, 1961) 219-227; and to Tiebout's The Community Economic Base Study, Committee for Economic Development Supplementary Paper No. 16 (New York, December, 1962) 84 pages.

⁹Homer Hoyt, "The Utility of the Economic Base Method in Calculating Urban Growth," Land Economics, XXXVII (August, 1961) 52.

wealth of information. Base studies can be as comprehensive as the resources available for conducting the study permit, but data and funds are usually limited.¹⁰

Identifying Basic Activities

To classify a given activity as basic is to say that by some unit of measure the activity serves the non-local market. Identification and measurement of basic activities are, therefore, associated, inseparable processes. Some unit of measure must be chosen by which identification of basic activities is made.

Units of Measure

Of the several units of basic activity measurement suggested in the literature, and discussed below, no single one is all-inclusive. The choice of one or more of the units depends upon the purpose of the study and the availability of data.

Employment

Employment, because of its economic significance and the availability of data, is the most widely used unit of measure in base studies.¹¹ The number of jobs is an important indicator of numbers of family groups and, hence, total

¹⁰Tiebout, The Community Economic Base Study, Supplementary Paper No.16, (New York: Committee for Economic Development December, 1962), p. 45.

¹¹Andrews, "The Problem of Base Measurement," Land Economics, XXX (February, 1954) 53-54.

population. Moreover, if the base study is to be used as a tool for prediction of changes in the economy, then the ratios of basic to service employment, basic to total employment, basic employment to total population, and total employment to total population, should be important results of the study. To obtain these ratios it is necessary that an analysis using a unit of measure other than employment include a conversion of that measure to employment.

When employment is used, adjustments must be made of "moonlighting," that is, the holding of two jobs by one person, and of part-time and seasonal employment to indicate an equivalent number of full-time jobs, if the amount of such employment is significant in the area.

An inadequacy of employment as a unit of measure, relevant for subsequent comparisons to an initial base study, is its lack of application to changes in productivity. Increased output per worker, for instance, could bring about changes in income and in the demand for services with no change in the number of basic employees.

Supplementary Units of Measure

Although employment is a fundamental quantitative measuring unit, and is intrinsic to the base ratios, it does not measure qualitative aspects of the community's economic base.¹³ Other units of measure, such as payrolls, value of

¹²Pierre R. Crosson, "Further Comment on Economic Base Theory," Land Economics, XXXVI (May, 1960) 197-201.

¹³Andrews, "The Problem of Base Measurement," Land Economics, XXX (February, 1954) 52-60.

production, and value added in production, some of which are more qualitative, are subject to limitations as great as those possessed by employment.

Payrolls, for example, while giving clues as to living standards, do not measure non-labor income. Non-labor earnings, such as income from rentals and interest on investment, may add substantially to total community income and employment. Measuring the base through physical production or value added in production does not account for non-physical output.

The conclusion is, though the unit or units of measure may be dictated by available statistics, that the limitations of the various units should be recognized. Where feasible, the use of a supplementary unit adds perspective to the study.¹⁴

Problems in Identification

Certain problems are common to the task of identifying basic activities in most urban areas. Representative of these problems are "mixed" and "linked" activities. Few firms are pure exporters. Ordinarily, a firm's activities are "mixed;" part of its output is for the local market (service), and part is for the non-local market (basic).¹⁵

¹⁴Andrews, "The Problem of Base Measurement," *ibid.*, p. 59.

¹⁵Andrews, "General Problems of Identification," Land Economics, XXX (February, 1954) 164.

There may exist in the community activities that are "linked" to, or are directly dependent on, basic activities for the sale of their product. The question arises in such an instance as to whether to count the activity as basic or service. An independent automobile starter factory which markets its product solely to a local automobile manufacturer-exporter is a clear-cut example of a linked activity that can be counted as basic as is the consuming automobile manufacturer.¹⁶ Few cases of linked enterprises are so easily identified and measured.

In the measurement of the base of highly specialized communities, such as satellite or university communities, special problems are encountered. In the case of the university city, for example, there is a problem of measuring the exports of goods and services consumed by the student. Sales of clothing, housing, and personal services, for instance, to students who normally reside outside the area are exports.¹⁷ A further complication in the measurement process arises from the part-time employment of students.

Techniques of Identification and Measurement

Several approaches to identification and measurement of basic activities appear in the literature on the economic

¹⁶Andrews, "Special Problems of Base Identification," Land Economics, XXX (August, 1954) 268.

¹⁷Ibid., p. 26.

base. Those currently regarded as feasible¹⁸ are the "sales-employment conversion," the "significant enterprise," and the "location quotients" techniques. The sales-employment conversion is a technique involving direct contact with firms, while the location quotient method indirectly identifies and measures basic activities. Each method, described below, uses employment as the unit of measure.

Sales-Employment Conversion

Through the use of questionnaires and interviews, the proportion of sales outside the area by each local firm is determined.¹⁹ This proportion is then applied to the firm's employment. As an example, if 50 per cent of a firm's sales are to individuals, businesses or institutions outside the base area, then 50 per cent of the firm's employees are said to constitute basic employment, with the remaining 50 per cent "service" employment.

Since firms seldom have complete records on the location of their customers, it is necessary to rely on estimates of sales by the firm outside the area. Such firms may or may not cooperate in making such estimates. Further, as the

¹⁸Early users of base analysis assumed certain activities, like manufacturing, to be basic, but this technique has been replaced by methods involving more realistic assumptions, such as those in the context of this paper.

¹⁹This method was used in the base study for Madison, Wisconsin. See John W. Alexander, "An Economic Base Study of Madison, Wisconsin," Wisconsin Commerce Papers (Madison: Bureau of Business Research and Service, The University of Wisconsin, 1953), 98 pages.

size of the area becomes larger, this method becomes more costly in terms of time and funds. In large areas, it is necessary to rely on sampling devices. The use of questionnaires and interviews, therefore, has important drawbacks.

The Significant Enterprise Approach

A simplified technique for base identification can be used when the activities of most significance to the economy are concentrated in a small number of firms. Operations of these firms are then studied to find the influence they exercise on the base. "Significance" could mean relation of the firm's size to other firms in the area, the proportion of the area labor force employed by the enterprise, and the relation of its payroll to total community income.²⁰ Using this technique, the researcher could give more attention to detail and accuracy in the study of the sample firms.

Care must be taken when using this technique that a perspective of the complete economy is obtained. Ignoring many small enterprises that, if added together, might exercise significant influence on total population and employment could cause the researcher to lose sight of the total economy.

The Location Quotient Technique

In the national economy, each major type of activity--

²⁰ Andrews, "Special Problems of Base Identification," Land Economics, XXX (August, 1954) 265-266.

agriculture, manufacturing, retail trade, and so on--employs essentially enough individuals to serve the population of the country.²¹ Location quotients²² compare local employment to national employment, on the supposition that the local economy requires the same proportion of its labor force in each activity as does the national economy. Industries employing a greater percentage of the local labor force than is employed nationally are assumed to export. For example, if 35 per cent of the local labor force were employed in manufacturing whereas 27 per cent of the national labor force were so employed, then 8 per cent of the local employment would be assumed to be basic. Thus, the method identifies export industries and roughly measures basic employment in those industries.

The following formula can be used to determine the number of basic employees in each industry group of employed persons:²³

²¹This statement has reference to a virtually self-sufficient country such as the United States.

²²The location quotient technique is attributed to Homer Hoyt. Techniques using essentially the same methods as the location quotients technique are termed "macrocosmic" by Andrews in "General Problems of Identification," Land Economics, XXX (May, 1954) 166; the "index of surplus workers," by John M. Mattila and Wilbur R. Thompson in "The Measurement of the Economic Base of the Metropolitan Area," Land Economics, XXXI (August, 1955) 215-228; and "localization coefficients" by C. L. Leven, in "Measuring the Economic Base," Papers and Proceedings of the Regional Science Association, II (1956) 250-258.

²³John M. Matilla and Wilbur R. Thompson call this the "Index of Surplus Workers" formula in "The Measurement of the Economic Base of the Metropolitan Area," Land Economics, XXXI (August, 1955) 215-228.

$$(2.1) \quad B = e_i - \frac{e_t}{E_t} E_i$$

Where:

B = the number of basic employees

e_i = local employment in the industry group

e_t = total local employment

E_t = total national employment

E_i = national employment in the industry group

If certain qualifications are made, such a method can be useful in identification and measurement of basic employment where data or resources prohibit more direct measures. Local divergencies from the national norm must be considered because of the following possibilities:

1. A given area may consume none of the production of a local industry, as Andrews points out in his example of a machining tool industry in a small city.²⁴

2. Industries in a given area may employ numbers below the national average, but may contain enterprises which are solely or in part engaged in exporting.²⁵

3. Local tastes and preferences may cause significant differences to occur between local consumption habits and national ones.²⁶

²⁴ Andrews, "General Problems of Identification," Land Economics, XXX (May, 1954) 166.

²⁵ Ibid.

²⁶ Ibid., p. 167.

Applying the Base Ratios

Given information on total employment and population in the community, and the number employed in the basic sector, it is possible to find the ratios of:

Basic to Service Employment
 Basic to Total Employment
 Basic Employment to Total Population
 Total Employment to Total Population

It is well recognized that different cities have different base ratios.²⁷ Large numbers of unmarried women employed in the base area, such as in Washington, D.C.; the existence of another city close by; and qualitative aspects of the area's population, such as a young, highly-skilled work force, will cause differences in the ratios between cities. Representing "typical" or average conditions²⁸ are the ratios given below:

Basic to Service Employment	1:2
Basic to Total Employment	1:3
Basic Employment to Total Population	1:6
Total Employment to Total Population	1:2

The above ratios indicate that out of a total population of, for example, 60,000, typically 10,000 would be employed by the community's basic activities, and 20,000 would be employed in service activities. A total employment of 30,000 would support 60,000 people.

²⁷ Andrews, "The Concept of Base Ratios," Land Economics, XXXI (February, 1955) 47-53.

²⁸ Ibid., p. 48.

In using the ratios to estimate changes in the economy,²⁹ it is assumed that when employment in the basic sector undergoes a change, sympathetic changes occur in service employment and total population.³⁰ According to the above ratios, if basic employment were increased by 100, an additional 200 workers would be required in the service sector, and total population would increase by 600.

Two possible economic conditions warrant consideration in the use of the ratios in forecasting. These conditions are unemployment and less than capacity operation in the service sector, the existence of which will inhibit sympathetic changes in total employment and population which result from a given change in basic employment.

For example, increases in the demand for services initiated by an increase in basic employment may be accommodated by existing service employment³¹ if service enterprises are operating at less than their capacity. An increase in basic employment could, in this instance, impel no increase in service employment.

²⁹It should be noted that the base study does not necessarily include a forecast, nor are the base ratios necessary in forecasting. See Charles M. Tiebout, The Community Economic Base Study, Supplementary Paper No. 16, (New York: The Committee for Economic Development, December, 1962), p. 77.

³⁰These changes, though automatic, do not occur instantaneously. See Andrews, "The Concept of Base Ratios," Land Economics, XXXI (February, 1955) 50.

³¹Or by a rise in prices if there are barriers to increases in scale.

Also, increases in total employment may initiate no change in population if the increased number of jobs are filled by unemployed members of the existing labor force.

Adjusting for Ratio Changes

Base ratios are not, of course, instruments for predicting the time and nature of events that will affect the local economy. Nor, as Hoyt points out, has such an instrument been perfected.³² The base study analyzes the economy at one point in time and gives ratios that can serve as tools for predicting possible changes in the local economy, given a change in its base.

When using base ratios to forecast employment and population, it is necessary to adjust for any changes that may have occurred since the ratios were computed. Outside influences such as recessions, shifts in industrial location patterns, and war; and internal influences, such as a change from a labor intensive to a capital intensive plant, can cause changes in the community's base ratios.

Appraising the Economy

The utility of the base study lies in the extent to which the base data can be used in appraising the economy's present and potential performance. Implicit throughout the

³²Homer Hoyt, "The Utility of the Economic Base Method in Calculating Urban Growth," Land Economics, XXXVII, (February, 1961) 58.

foregoing discussion of the base study process is the importance of income creation, although, because of the practical and conceptual difficulties in measuring income, this discussion, along with base analysis in general, concentrates its attention on employment.

While base analysis concentrates on employment, an appreciation not only of employment but also the flow of income is important in appraising the economy. Obviously, service employment is dependent upon the local expenditure of income from both basic and service employment. However, it is through the initial expenditure of income from basic employment that service employment is created. Therefore, the treatment of the flow of income in the appraisal process becomes more explicit.

The following simplified model provides a framework for analyzing the flow of income within an urban area.

Basic enterprises produce goods and services to be exchanged outside the community for income. Net income³³ flowing into the community from outside is distributed initially as follows:

1. to local establishments furnishing product inputs.
2. to employees of basic enterprises in the form of wages and salaries, and
3. to the owners of basic enterprises in the form of profit.

³³Net income here refers to total receipts minus payments to individuals, businesses, and institutions outside the community for produce inputs--raw and semi-finished materials, and services.

Income paid by basic enterprises to local establishments for resources is directly linked to the basic enterprises. Employment in a linked activity needed to serve an exporting enterprise is basic employment,³⁴ the income from which is dispersed in the same manner as other basic employment income.

Employees' income from wages and salaries and owners' profits are used for savings and expenditures. The allocation of income between saving and spending depends upon the saving and spending habits of the area's inhabitants. For purposes of simplification, that portion of income that is saved is omitted from the discussion.

Expenditures of basic income by these individuals have the following flow:

- A. outside the community for goods and services; that is, for imports,
- B. locally to individuals, businesses and institutions for goods and services produced inside the area.

The income spent locally accrues to the community's service establishments for goods and services produced inside the area. From there it is respent locally for goods and services, or it flows outside the community to pay for imports.

Indicated by the above model is the necessary dependency of the community upon other areas for goods and services. Interdependency among individuals within the community is also illustrated. A study within this type of framework can

³⁴See the discussion of "linked" activities, page 15.

give clues as to how effectively service enterprises are operating. Local market possibilities may be indicated.³⁵

For example, imports by residents of goods and services that are or could be furnished inside the area may be revealed. In a freely competitive economic atmosphere, if there is a competitive advantage, it should be taken. If firms inside are not competitive with firms outside the area, then importing will occur. Should the local firms be operating at less than optimum capacity, then local resources are not being used to their potential. Real income is maximized when resources are used most efficiently.

Base analysis may pinpoint local problem areas. For instance, heavy reliance on a basic industry that is subject to governmental or industrial policy changes may be shown. Demand for military aircraft replaced by demand for missiles, for example, caused employment and population changes and need for economic adjustment in Wichita, Kansas.³⁶ Sandia Base installation, because of its experimental function, was appraised as being a reasonably reliable source of income in the Albuquerque, New Mexico, base study. Kirkland Field, on the other hand, was viewed as being a less reliable source of

³⁵Statements implying market potentialities, made in base literature, are no doubt the cause for the accusation that the base concept has a mercantilistic bias. Discussion of this criticism appears on pages 9 and 10.

³⁶Homer Hoyt, "The Utility of the Economic Base Method in Calculating Urban Growth," Land Economics, XXXVII (February, 1961) 55.

income because of its military preparedness function.³⁷

In a local economy, a current employment boom in an industry, such as residential construction, may be the result of a backlog of demand that may be satisfied in the near future. Preparations can be made for a decline in such employment if the possibility of a decline is pinpointed.

In this chapter, the economic base study process, consisting of delimiting the base area, identifying and measuring basic activities, applying the base ratios, and appraising the economy, was discussed. In the chapter which follows, the analysis is applied to the Stillwater economy.

³⁷Bureau of Business Research, University of New Mexico, and Research Department, Federal Reserve Bank of Kansas City, Missouri, The Economy of Albuquerque, New Mexico, 1949, p. 45.

CHAPTER III

THE STILLWATER ECONOMY

Base Area

Stillwater, the Payne County seat, is situated in north-central Oklahoma, 68 miles north-east of Oklahoma City and 76 miles west of Tulsa.¹

The incorporated area of Stillwater constitutes the base area for this study. Much of the information considered vital for the present study is provided for incorporated areas in census publications. In most instances census data is the only information available.² It is felt that the incorporated area fulfills the requirements for base areas presented in Chapter II as well as the other existing area designations,³ or as some arbitrary delimitation that would

¹The Business Extension Service, Oklahoma State University, The Economic Factors of Stillwater and Payne County, a report prepared for the Oklahoma Department of Commerce and Industry (Stillwater, 1962), p. 12.

²Since frequent use is made of published volumes of the Census of the Population, 1960 (U.S. Department of Commerce, Bureau of the Census [Washington: U.S. Government Printing Office]), later references in this thesis will be footnoted simply 1960 Census, with the appropriate volume title.

³Payne County, Stillwater Township, and the Primary Planning Area were considered as possible base area designations.

perhaps be more realistic for the study but impractical because of inaccessability of data. Goods and services produced for and consumed by individuals, businesses, and institutions whose normal location is outside the boundaries of the incorporated area are considered exports.

It should be noted that college students are counted as residents of the community in which they are residing while attending college in the 1960 Census of the Population. Also, the area constituting what is called "Vets Village," since deannexed, was a part of the incorporated area in 1960. Therefore, the residents of Vets Village, married students and their families, are also included as Stillwater residents in the census count. For purposes of this study, however, the term "residents" refers to those individuals whose normal residence is Stillwater--the total census population count minus those who are listed in the Census as being college students. The term "residents" in this study, therefore, excludes students but does not exclude the families of married students. Further discussion of this subject appears on pages 50 and 51.

Basic Activities

Identification and Measurement

Information on what and how much firms produce and sell

outside the Stillwater area, thus bringing employment⁴ and income to the community, is not available except by asking the individual business operators. Such a survey, because of the resources required for gathering the data, is considered beyond the scope of this study.

That this thesis lacks a complete survey, or a survey of sample firms, is not felt to be a severe disadvantage. Short-cut approaches, though possessing drawbacks as alternatives to surveying to identify and measure basic activities, seem appropriate for use here for three notable reasons.

First, base studies were conceived as tools that could be used in appraising and in predicting changes in urban economies without incurring the time and cost involved in complete economic surveys.⁵

Second, firms are somewhat reluctant to reveal information on the exact nature and destination of their sales. Moreover, the quality of the information, once obtained, is questionable. Retailers seldom have complete records on the usual residence of their customers, making it necessary for them to estimate the percentage of their sales to individuals outside the area. In Stillwater the estimate is made more

⁴The number of persons per firm needed to serve the export market can be computed by converting the percentage of export sales to firm employment, as explained on page 16.

⁵Andrews, "Historical Development of the Base Concept," Land Economics, XXIX (February, 1953) 161-167, and Andrews, "Comments Re Criticisms of the Economic Base Theory," Journal of the American Institute of Planners, XXIV (1958), p. 37.

difficult because of the added problem of differentiating student customers, whose purchases are exports, from customers who are normally local residents. Information obtained through surveying would, then, be estimated.

Third, as will be shown, the Stillwater economy is a specialized, rather simply constructed one, making simplified techniques, which would be inadequate for complex, highly diversified urban centers, sufficient tools for this study. Considering the resources needed to gather the survey data, the survey is believed to be of comparatively less practical value than estimates made indirectly through available techniques.

Location quotients, discussed in Chapter II, are used to identify basic activities in the Stillwater area. This technique measures and identifies basic activities through employment, which is the unit of measure in which the large amount of available data are stated. An insufficient amount of information was accessible to warrant the primary use of either payrolls or income in this study.

The task in studying Stillwater's economic base, then, is in identifying activities that serve the non-local market, and determining the employment created by those activities. Results of the identification and measurement process are given in the discussion below.

Identification by Location Quotients

Table I, below, compares the employment pattern of the

Stillwater area with that of the nation. For each industry group of employed persons, the table shows the percentage of Stillwater's employment in the industry group as compared to the nation's employment in that industry group. The percentage of local employment in excess of the national percentage in each industry group is assumed to be basic employment.

Such a comparison of local to national employment assumes that the community's consumption of the products of each of the industry groups is the same as the national average. Also assumed is that productivity of resources, mainly labor, is the same as the national average. Under these assumptions, the city would require, in the absence of economic specialization, the same percentage of its labor force to produce the products of each industry group as does the nation.

Table 2 shows numbers of workers, rather than percentages, above or below the number that otherwise would be required locally, based on the same assumptions above.⁶ Tables 1 and 2 indicate which industry groups contain basic employment, and the proportion of the local labor force that is basically employed in those industry groups.⁷ This information is summarized in Table 3.

⁶An explanation of the technique used to determine the information given in Tables 1 and 2 on basic employment is presented on pages 17 to 19.

⁷The census industry groups referred to in Tables 1 and 2 as "Other Retail Trade" and "Other Personal Services," are hereinafter referred to as "Retail Trade" and "Personal Services," respectively. To allocate surplus workers to the "Industry Not Reported" group, the total number of surplus

TABLE 1
 PERCENTAGE DISTRIBUTION OF EMPLOYED PERSONS
 BY INDUSTRY GROUP, CITY OF STILLWATER,
 AND THE UNITED STATES, 1960

Industry Group	Percentage of Total Employed Stillwater ^a	Percentage of Total Employed U.S. ^b	Percentage of Basic Employment Stillwater (Col.1-Col.2)
	(1)	(2)	(3)
Agriculture.....	3.5	6.6	- 3.1
Forestry and Fisheries	.1	.1	---
Mining.....	.9	1.0	- .1
Construction.....	5.4	5.9	- .5
Manufacturing.....	4.3	27.1	-22.8
Railroad and Railway Express Service.....	.2	1.5	- 1.3
Trucking Service and Warehousing.....	.8	1.4	- .6
Other Transportation..	.4	1.4	- 1.0
Communications.....	1.2	1.3	- .1
Utilities and Sanitary Services.....	1.3	1.4	- .1
Wholesale Trade.....	1.7	3.4	- 1.7
Food and Dairy Products Stores.....	2.1	2.6	- .5
Eating and Drinking Places.....	2.7	2.8	- .1
Other Retail Trade....	10.8	9.4	+ 1.4
Finance, Insurance, and Real Estate.....	2.9	4.2	- 1.3
Business Services.....	.4	1.2	- .8
Repair Services.....	1.0	1.3	- .3
Private Households....	2.2	3.0	- .8
Other Personal Ser....	5.3	3.0	+ 2.3
Entertainment and Rec. Services.....	.9	.8	+ .1
Hospitals.....	.7	2.6	- 1.9
Educational Services			
Government.....	37.0	3.9	+33.1
Private.....	1.2	1.3	- .1
Welfare, Religious and Non-Profit Membership Org.	2.1	1.3	+ .8

TABLE 1--Continued

Industry Group	Percentage of Total Employed Stillwater ^a	Percentage of Total Employed U.S. ^b	Percentage of Basic Employment Stillwater (Col.1-Col.2) (3)
	(1)	(2)	
Other Professional and Related Ser.....	2.2	2.5	- .3
Public Administra- tion.....	5.4	5.0	+ .4
Industry Not Reported.....	3.3	4.0	- .7
Total.....	100.0	100.0	---

^aCalculated from 1960 Census, Vol. 38C, General Social and Economic Characteristics, p. 190. See formula, page 19.

^b1960 Census, Vol. 38, General Social and Economic Characteristics (U.S. Summary), p. 221.

TABLE 2
 ACTUAL, NEEDED, AND BASIC EMPLOYMENT
 BY INDUSTRY GROUP
 STILLWATER, 1960

Industry Group	Actual Employment ^a (1)	Employment Needed ^b (2)	Basic Employment ^c (3)
Agriculture.....	295	553	- 258
Forestry and Fisheries	8	12	- 4
Mining.....	72	85	- 13
Construction.....	459	496	- 37
Manufacturing.....	362	2,277	-1,915
Railroads and Railway Express Service.....	13	122	- 109
Trucking Service and Warehousing.....	66	118	- 52
Other Transportation..	36	115	- 79
Communications.....	102	107	- 5
Utilities and Sani- tary Services.....	113	117	- 4
Wholesale Trade.....	143	288	- 145
Food and Dairy Prod- ucts Stores.....	175	220	- 45
Eating and Drinking Places.....	229	234	- 5
Other Retail Trade....	906	791	+ 115
Finance, Insurance, and Real Estate.....	247	350	- 103
Business Services.....	37	99	- 62
Repair Services.....	84	110	- 26
Private Households....	186	249	- 63
Other Personal Ser....	449	252	+ 197
Entertainment and Rec. Services.....	73	65	+ 8
Educational Services			
Government.....	3,113	330	+2,783
Private.....	99	111	- 12
Welfare, Religious and Non-Profit Member- ship Organizations..	177	111	+ 66

TABLE 2--Continued

Industry Group	Actual Employment ^a (1)	Employment Needed ^b (2)	Basic Employment ^c (3)
Hospitals.....	59	219	- 160
Other Professional and Related Ser.....	184	214	- 30
Public Administration..	455	416	+ 39
Industry Not Reported..	274	170 ^d	+ 104 ^d

^aSource: Table 1.

^bCalculated by applying the location quotient formula, given on page 19.

^cCol. 2 minus Col. 1.

^dFor method of allocation, see page 31.

TABLE 3

BASIC EMPLOYMENT, BY INDUSTRY GROUP
STILLWATER, 1960

Industry Group	Basic Percentage ^a	Basic Number ^b
Retail Trade.....	1.4	115
Personal Services.....	2.3	197
Entertainment and Recreation Services.....	.1	8
Educational Services, Government....	33.1	2,783
Welfare, Religious, and Non-Profit Membership Organizations.....	.8	66
Public Administration.....	.4	39
Industry Not Reported Allocation....	---	104
Total Number of Basic Employees	---	3,312

^aSource: Table 1.

^bSource: Table 2.

Each of these industry groups is discussed below to narrow the identification from basic industry groups to specific activities within the industry groups. The component enterprises in the industry groups are those used and defined in the census publications and the Standard Industrial Classification Manual.⁸

Retail Trade

The category referred to here includes establishments engaged in retailing building materials, hardware, general merchandise, farm equipment, apparel and accessories; and gasoline service stations, drug stores, jewelry stores, and florists.

Since sales to students are defined in the present study as exports, the community would logically require employment in the enterprises patronized by students to serve this non-local market. Enterprises in this group that would appear to be student-serving include gasoline service stations, which may also serve tourists, referred to below; apparel and accessory stores; drug stores; and florists. Also, to the extent that the city is a trade center for

workers indicates in Table 2, Col. 3, is divided by the total employed, Col. 1, to find the proportion of surplus employment to total employment. It is assumed that the same proportion, 38%, of the "Industry Not Reported" group is basic.

⁸1960 Census, Vol. 38C, General Social and Economic Characteristics, p.xxii; and Standard Industrial Classification Manual, Executive Office of the President, 1957.

residents of the surrounding area, the retail establishments are serving a non-local market, or, in other words, are exporting.

Personal Services

Employment in hotels, lodging places, dressmaking, shoe repairing, laundering, cleaning, and dyeing, is included in this industry group. One would expect local employment to be above the national average in this category, because:

1. Some students at Oklahoma State University reside in private lodging places rather than in University housing, creating employment in this type of establishment.

2. Certain activities of the University bring tourists into the area, causing a need for hotels and motels. Examples of such University activities are short-courses in adult education, conventions, conferences, and athletic events on the campus. Tourists may contribute also to employment and income in retail trade establishments.

Entertainment and Recreation Services

Student use of recreation facilities no doubt contributes to the greater than average percentage of employment in this industry group, which includes radio broadcasting, theaters, motion pictures, bowling alleys, and billiard parlors.

Educational Services, Government

Stillwater's basic activity in this industry group⁹

⁹Included under "Educational Services, Government" is government employment in establishments furnishing formal

is Oklahoma State University, which is a "significant" basic enterprise.¹⁰

A further consideration of the University as a basic activity is that Stillwater residents attend Oklahoma State University, meaning that the University is not a pure exporter.¹¹ This consideration can be said to be "built in" to the measuring technique used in this thesis. Of the employment in the industry group "educational services, government," 330 are allocated (Table 2) to the category of service employment. If teachers in elementary and secondary schools are considered service employees, and the 191 so employed¹² are deducted from the service employment allocation, then 139 can be allocated by inference to service employment by Oklahoma State University. To the extent that the area pays taxes to support the institution, its residents are, of course, paying for a service establishment.

academic or technical courses, correspondence schools, commercial and trade schools, and libraries. Employment in educational institutions run by private individuals or groups is included under "educational Services, Private."

¹⁰The University's obvious dominance is shown by the fact that the student body constitutes over one-third of the total census population; and of the 8,416 individuals employed in the base area, 3,811 of the non-agricultural workers are employed by government (1960 Census, Vol. 38C, General Social and Economic Characteristics, pages 184 and 187).

¹¹A discussion of "mixed" activities is given on page 14.

¹²1960 Census, Vol. 38C, General Social and Economic Characteristics, p. 187.

Welfare, Religious and Non-Profit Membership Organizations

Of particular significance for the Stillwater base study is that this industry group includes social and fraternal organizations.¹³ Ten sororities and twenty fraternities,¹⁴ each maintaining group housing and employing cooks, no doubt account for a large portion of the 66 basic employees identified in this category.

In addition to employment by these fraternal groups, there are individuals engaged by several church groups specifically to minister to the student population.¹⁵ These individuals constitute basic employment.

Public Administration

Indicated by the indirect measurements is that there are 39 basic employees in the industry category "public administration. Since Stillwater is the seat of county government, there are county government employees residing within the City. According to the "Employee's Salary and Wage Record, 1960," in the County Clerk's Office, there were 89 persons paid every quarter of 1960.

To determine that proportion of the 89 who can properly be allocated to the basic employment sector, the services

¹³ Along with business associations, professional membership organizations, labor unions, civic associations, and political, religious, and charitable organizations.

¹⁴ 1960 Student-Faculty Directory, Oklahoma State University (Stillwater, 1960).

¹⁵ Ibid.

rendered by county employees are assumed to be urban service up to the share which the urban population holds to the county.¹⁶

Since the base area constitutes 54 per cent of the county population,¹⁷ then 54 per cent of the county employees constitute service employment, with the remaining 46 per cent basic. This method yields a total of 41 basic employees, just 2 over the number obtained by the more indirect method used in Table 2.

Yet, here it is demonstrated that methods of calculating basic employment may be inexact. For example, the entire group of county employees could conceivably reside in Stillwater, a possibility set aside by each of the indirect measuring techniques used. Nevertheless, that the county government contributes to the employment of the base area is proven.

Appraising the Economy

For purposes of analysis, the economy is divided into the basic, or exporting, sector, and the service sector.

It should be noted that other sector divisions could be made. The fact that government plays a dominant role in the

¹⁶ Andrews, "Special Problems of Base Measurement," Land Economics, XXX (July, 1954) 265.

¹⁷ The population of Stillwater as given in the 1960 Census is 23,965 and the population of Payne County is 44,231. Vol. 38C, General Social and Economic Characteristics of the Population, pp. 181 and 209.

Stillwater economy is apparent from the listing of basic industry groups. Governmentally provided educational services and public administration together employ 2,822, or 85 per cent, of the 3,312 identified as basic employees. Retail trade; personal services; welfare, religious and non-profit membership organizations; and entertainment and recreation services; together employ the remainder, or 15 per cent, of the persons producing for the export market. Since this latter group consists of private, as opposed to government, enterprises, the sector divisions could be "government" and "private." It is felt that the sectors "basic" and "service" lend themselves to more meaningful analysis.

An appraisal of the enterprises in the basic sector is below, followed by a discussion of the community's service sector.

The Basic Sector

Oklahoma State University

Oklahoma State University can safely be looked upon as a permanent source of employment in the Stillwater area. The institution was established in 1891, after the early citizens of the city voted a \$10,000 bond issue to aid in the construction of Oklahoma Agricultural and Mechanical College, later re-named Oklahoma State University of Agriculture and Applied Science. Since that time the growth of

the city has been closely correlated with the growth of the University.¹⁸

It is anticipated that the area can expect not only the continuance of present employment benefits, but expanded employment opportunities as a result of the University. Because of the increased number of college-age individuals, enrollment in institutions of higher education is predicted to increase substantially in future years. Oklahoma State University is expected to share in the increased enrollment.

With increased enrollment, additional faculty and staff members will be required, meaning that the ~~number~~ of basic employees provided the community by Oklahoma State University will increase.

County Government Employment

There appears to be no evidence to indicate that Stillwater will lose its status, obtained in 1889,¹⁹ as the county seat. Therefore, this portion of the basic employment can be regarded as dependable and permanent.

Retail Trade

Growth of employment in retail trade establishments will no doubt be heavily dependent upon the increase in University student enrollment and the resultant growth in employment

¹⁸Metropolitan Comprehensive Plan Report, City of Stillwater, (The Business Extension Service, Oklahoma State University, 1961), p. 9.

¹⁹Ibid., p. 2.

and population. As population increases, purchases of goods from retail outlets will expand, even if no change occurs in the proportion of local income that is spent locally for retail goods. Conceivably, with improved highways and shortened travel time to Oklahoma City and Tulsa, the tendency to import could increase. Local retailers should be aware of this possibility if they are to enjoy the economic benefit of University and community growth.

Personal Services Employment

The discussion above of retail trade potential in the economy applies also to the potential in hotels, motels, rooming houses, dressmaking, shoe repairing, laundering, cleaning, dyeing, and other such establishments in the personal services category.

Entertainment and Recreation Services Employment

As population grows, there will be increased needs for entertainment and recreational facilities within the community. Some of these needs may be served by the municipal government through improvement in public facilities. Plans have been made, for example, to improve and expand the facilities in Boomer Lake Park.²⁰

Welfare, Religious and Non-Profit Membership Organizations

From the analysis in this study, it cannot be said with certainty that basic employment in this category will increase,

²⁰ Boomer Lake Park Plan, (Business Extension Service, Oklahoma State University, 1962), 37 pages.

although there are implications that service employment, sympathetic to growth in other basic activities, may increase.

The Service Sector

Industry groups containing basic employment have been discussed above. Estimates of employment needed in each industry group to serve local needs were made by an indirect measuring technique. The number found to be required to serve local needs was deducted from total employment in each industry group to find any employment in excess of local needs. Excess employment was considered basic employment. Specific basic activities were segregated and analyzed.

Each of the industry groups, including those in which basic elements were identified, contains some service employment. By deducting the number of basic employees from total employment in each industry group, the community's service employment is found. Service employment in each industry group is presented in Table 4.

According to the findings of this study, each of the industry groups in Table 4, except those containing basic employment, employs fewer than the number needed to supply local needs. This indicates that the community imports the products produced by these industry groups from other areas.

It may be that economic efficiency would be increased and the economy improved if employment were increased in some of the industry groups to be adequate to serve more or all of local needs. However, in most of the activities that are

TABLE 4
SERVICE EMPLOYMENT BY INDUSTRY GROUP
STILLWATER, 1960^a

Industry Group	Service Employment ^b (1)	Deficiency of Employment ^c (2)
Agriculture.....	295	258
Forestry and Fisheries.....	8	4
Mining.....	72	13
Construction.....	459	37
Manufacturing.....	362	1,915
Railroad and Railway Express Ser....	13	109
Trucking Service and Warehousing....	66	52
Other Transportation.....	36	79
Communications.....	102	5
Utilities and Sanitary Services.....	113	4
Wholesale Trade.....	143	145
Food and Dairy Products Stores.....	175	45
Eating and Drinking Places.....	229	5
Other Retail Trade.....	791	---
Finance, Insurance and Real Estate.....	247	103
Business Services.....	37	62
Repair Services.....	84	26
Private Households.....	186	63
Other Personal Services.....	252	---
Entertainment and Recreation Services.....	65	---
Educational Services Government.....	330	---
Private.....	99	12
Welfare, Religious and Non- Profit Membership Org.....	111	---
Hospitals.....	59	160
Other Professional and Related Services.....	184	30
Public Administration.....	416	---
Industry Not Reported Allocation....	170	---
Total Service Employment	5,104	---

^aSource: Table 2.

^bNumber employed in each industry group less basic employees in the industry group.

^cNumber needed less number employed.

shown to be deficient in local employment, such deficiencies would be expected.

Stillwater, like all urban economies, is not economically self-sufficient. Self-sufficiency within an urban area is not a realistic, or for that matter, a desirable economic goal, as was pointed out in Chapter I. Stillwater has different resource endowments and location advantages than do other urban areas; the city should specialize in the activities which it performs most efficiently, and import goods and services in which it has less economic advantage from other areas.

For several of the categories where importing is indicated, however, it would be anticipated that the local employment would be adequate or more than adequate for serving local needs. Specifically included in this group are communications, utilities and sanitary services, eating and drinking places, and hospitals. In communications and in utilities and sanitary services, the deficits shown in employment are so small that an attempt to explain the deficits is not feasible. The deficiencies of employment in eating and drinking places and in hospitals are discussed below.

Eating and Drinking Places

Because of the large resident student body, it would be expected that basic employment would be revealed in this category. The analysis indicates, however, that the percentage employed locally in this industry group is slightly under the national average.

The fact that the University provides food services to students as well as the public through its Auxiliary Enterprises negates the expectation of basic employment in eating and drinking places. Although students patronize private eating and drinking establishments, thereby constituting export trade, the use of the University food services by non-student residents may be sufficient to offset extra employment that would be required in private establishments.

Hospitals

A question exists here on the extent to which the base area is shown to be deficient in employment in hospitals, a deficiency which would appear attributable partially to the furnishing of hospital services to students and faculty by the University. The Census, however, states that those employed by hospitals are included in that industry group, regardless of whether those individuals are paid from private or public funds.²¹ It appears that the lack of basic employees in this category may be due to students using hospital facilities at the place of their usual residence when the services needed are of a non-emergency or discretionary nature.

The Appraisal, Summarized

The Stillwater economy is a specialized, simply constructed one, with a significant growth potential in

²¹1960 Census, Vol. 38C, General Social and Economic Characteristics, p. xxxiii.

employment and population.

A substantial portion of the area's basic employment is dependent upon government. Oklahoma State University, the most significant of the basic enterprises, is supported by federal and state government funds. Basic employment in public administration is supported by the county government. Each of these sources of employment and income is regarded as dependable and permanent.

As enrollment at Oklahoma State University increases, more faculty and staff will be required; basic employment will increase. Additional faculty and staff brought into the area add to the area's aggregate demand--for example, for houses, for goods sold through retail outlets, and for professional services. Retail trade, personal services, and entertainment and recreation services, each employing individuals to serve students, will experience growth as the resident population increases, and as the student body increases.

Since basic employment is predicted to increase, in other words, service employment and total population will increase. Increases in the urban population have, of course, other important economic ramifications--increases in the need for governmentally provided services, such as police and fire protection, sanitation services, and schools.

Given the base ratios, predictions of the quantitative changes in total employment and population can be made. A discussion of the base ratios for the Stillwater economy follows.

The Base Ratios

Stillwater's employment has been allocated in the preceding analysis to the two categories "basic" and "service." Given this information, one can find the base ratios, through which predictions of changes in the area's economy can be made.

In computing the base ratios, the question of whether to include the resident student body as part of the population presents itself. Of the 23,965 residents listed in the Census, 8,237 are shown to be enrolled in college,²² meaning that, according to the base concept of "outsiders," 15,728 is the resident population.

Employment at Oklahoma State University is created primarily to serve students from outside the area. Students are considered non-resident in the determination of basic and service employment. For example, sales to students are labeled as exports, and any employment student customers create in retail establishments is labeled basic employment. It has been demonstrated, in short, that much of the area's basic employment is created by students from outside the Stillwater area.

To count students as part of the population in the ratios is to say that jobs in the basic sector support not only those normally residing in the area, but also the 8,237

²²1960 Census, Vol. 38C, General Social and Economic Characteristics, p. 184.

students. Many students work part-time, both for the University and for private establishments, while attending Oklahoma State University. It is felt, however, that most of the expenditures made by students in the area are financed not from the income they earn in the area, but by funds originating outside of Stillwater. To say that area employment supports the student body is unrealistic.

A further aspect of the student-total population discussion is that of married students who reside with their families in the base area. The families of students living in Stillwater are included in the total census population figure. Some student families reside in "Vets Village," which, as explained earlier, was included in the incorporated area of Stillwater for the census count. Also, members of student families who are employed in the area are included in the industry groups of employed persons in Tables 1 and 2.

If students, but not families of students, are excluded from the total population, then the supposition is that members of their families are normal residents. To the extent that families of students are supported by income from outside the area, then including them as a part of the resident population, which is supported by local employment, is unrealistic. To the extent that families of students are employed, however, it is desirable to include them in the resident population.

The assumption is made that the effect of students' families upon the local economy more closely resembles that

of a resident than that of an outsider. That is, it is assumed that they are more likely to be employed, and that their consumption patterns are different from the average student. In computing the ratios, students are, therefore, excluded, but families of students are included, in the resident population.

The base data for Stillwater then become:

Basic Employment	3,312
Service Employment	5,104
Total Employment	8,416
Total Population	15,728

Base ratios for the Stillwater economy are:

Basic to Service Employment	1:1.5
Basic to Total Employment	1:2.5
Basic Employment to Total Population	1:4.7
Total Employment to Total Population	1:1.9

In the Stillwater base area, there are fewer service employees and less total population for each basic employee than in a "typical" community.²³ Excluding students from the total population in computing the ratios may contribute to the divergence from the average ratios of employment to population.²⁴

The literature on the economic base pointed out that

²³The base ratios for a "typical" community, given on page 20, are: basic to service employment, 1:2; basic to total employment, 1:3; basic employment to total population, 1:6; and total employment to total population, 1:2. If the Stillwater base ratios were rounded, of course, the differences between this city and the "typical" city would be less.

²⁴If students were counted as residents, however, the ratios would be substantially greater than the "average." The ratio to basic employment to total population would be 1:7.2; total employment to total population would be 1:2.8.

different urban areas have different base ratios.²⁵ That a study area has different base ratios than the "typical" city is not of great concern if the ratios are believed to be reasonably accurate. Stillwater's base ratios may differ from those of the average city because it is more specialized than the average urban economy.

Applying the Base Ratios

The ratio of basic to service employment indicates that for an increase of one job in the basic sector, an additional 1.5 jobs will be created in the service sector. On the basis of a change of one job in the basic sector, therefore, total employment will change by 2.5. Further, the ratio of basic employment to total population indicates that a change of one basic employee initiates a change in total population of 4.7.

In the practical application of the ratios, consideration must be given to the assumption of full capacity in the service enterprises. If some excess capacity in service activities should exist, no change in service employment need result from a small increment in basic employment. Should the change resulting from a small increase in basic employment be measured in income rather than employment, however, a sympathetic change, though perhaps small, should be detected. Use of employment as the single unit of measure limits the use of the ratios.

²⁵See page 20.

Given a substantial increase in basic employment, sympathetic changes will occur in service employment and total population. "Substantial" here infers an increment in basic employment large enough to create needs for additional service employment. In other words, if the University, on the basis of a predicted future increase in the number of students, hires, say, 100 faculty and staff members, one could expect an increase in total employment of 250, and in total population of 470.²⁶

Limitations of the Study

Those limitations possessed by base analysis are, of course, inherent in the present study. Other limitations occur because of data inadequacies.

The indirect measure used to identify and measure basic employment is an alternative to direct measurement through surveying. Inherent in the technique are certain limitations. Assumptions are made, for example, that the area's consumption follows the national norm. Direct questioning of individuals and firms regarding their employment, income, and expenditures might reveal important divergencies from this norm. Also, the assumption is made that unless local employment in an industry is adequate to serve local needs, then no exporting by that industry exists. For a given industry, this may be a realistic assumption. For a specific

²⁶Excluding college students.

enterprise within the industry, the assumption may cause the exporting activities and the income and employment creation of the enterprise to be overlooked. As an example, over 50 per cent of a local printing firm's sales are to individuals, businesses and institutions outside Stillwater, while the firm spends 70 per cent of its cost dollars locally.²⁷ This enterprise is included under the industry group of manufacturing, in which the base area is shown to be deficient in employment needed to serve local needs.²⁸

This study loses some perspective because of the single measuring unit used. Other units of measure would have been useful supplements to employment. Earnings from factors of production other than labor are not analyzed. The severity of this limitation is not measurable since the extent of earnings from capital and rentals is not known. Because rental property is a greater percentage of the total local housing than in most State urban areas,²⁹ this is a limitation worthy of mention.

Student and other part-time employment was not calculated. That students are hired by the University and by private establishments is an important consideration, since the aggregate of such employment deducts from employment

²⁷The source of this information is from a personal interview with Dennis Reynolds, of Frontier Printers, August 29, 1962.

²⁸See Table 2, page 34.

²⁹1960 Census, Vol. 38, Census of Housing, pp. 12 and 33.

opportunities of permanent residents in the area.³⁰ To the extent that the income derived from such employment is spent locally, this consideration is of less import.

A survey showing student purchases from private retail establishments would have benefitted the analysis. The impact on retail trade by student purchases was not measured except through employment that such trade would cause to occur in local enterprises.

³⁰Of course, many students who are employed part-time by Oklahoma State University or by local enterprises might be unable to attend college were it not for their ability to provide a portion of their income while residing in the area.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

In this thesis the economic base theory and its approach to the analysis of urban economies are described. The chapter on the base theory can serve as a guide for individuals involved in making urban economic base studies. The section on the Stillwater base area provides an example of the theory's application, as well as providing information on the local economy. Contained in the bibliography are reference materials available on the economic base approach.

The theory states that the economy of a community and its growth are dependent upon the community's ability to earn income from outside the area. In the application of the theory as an approach to economic analysis, the economic activities of a community are divided into basic--those activities which serve the non-local market, and service--those activities which serve the individuals and firms inside the base area. Basic and service activities may be identified and measured by surveys of the firms within the area, or by indirect techniques. The urban economy is appraised in terms of the basic and service activities and their growth potential.

In the application of the base approach to the base area of Stillwater, an indirect identification and measurement process was used. Stillwater's basic and service activities were identified and the enterprises found to be earning income by serving a non-local market were appraised.

The base ratios for Stillwater show that for each basic employee, there are 1.5 service employees and a total population of 4.7. In other words, the ratios indicate that for a change of 100 basic employees, total employment will change by 250, and total population will change by 470. These ratios are based on the present economic relationships within the community.

Because of the permanent nature of the basic enterprises, particularly Oklahoma State University, the area's sources of income and employment are reliable. Since it is expected that the student population of Oklahoma State University will increase substantially in future years, the area can anticipate growth in basic and service employment and total population. The growth that is possible in the service enterprises will depend, in part, upon the ability of the service enterprises to serve an enlarged local market.

Conclusions

The economic base theory provides a useful approach to understanding the economy of an urban area. Economic base analysis shows the dependence of a community upon other areas, and how a community earns its living.

The base ratios obtained in a base study can be used in predicting changes in employment and population. As predictive tools, the ratios are not wholly reliable, however, because of the dynamic aspect of urban areas. Unpredictable influences outside and inside the urban area can cause the ratios to change. Further, the ratios should not be used as single predictive tools since they are based at the most on good estimates. Much better data are needed at the local level upon which to base economic decisions.

It is felt by this writer, however, that the ratios can be of usefulness to urban economists and public officials as supplements to trend projections in forecasting utility needs, land use requirements, residential housing demands, and requirements for public services and facilities.

One of the important limitations of economic base analysis is that it does not embrace dynamic aspects of an economy. Although base ratios can be used to predict changes in the economy, the ratios are based on present economic relationships, which are subject to change. The base approach, further, does not give sufficient tools for analyzing the flow of income within an urban area. It is believed that such limitations are inherent in other types of economic analysis, however, and that in light of its simplicity, the base approach provides an important contribution to urban economics.

The greater the depth and scope that can be obtained in base studies, the greater, of course, will be their

reliability and usefulness. When indirect measures of economic activities are used, the findings must be qualified to offset unrealistic assumptions. However, indirect measurements reveal information that is otherwise unavailable, particularly in cases where direct measurements are not feasible.

In the case of the Stillwater base study, it is verified that Oklahoma State University provides economic support for the urban area. While this was obvious before the study, the study shows the extent of the area's dependence upon the University, and provides data for estimating the effect of University growth upon the local economy. Suggested by the study are areas where local demands are not being served locally. For example, the base area is shown to have a deficiency of employment in repair services and in eating and drinking places, when it would be expected that basic employment would exist.

It is believed that the application of the base concept to the Stillwater area has given insight into the local economy, and that the information given is useful to one who is interested in the area's potential. The test of the accuracy of the ratios, of course, will come in the future. If increments of University employment, for example, cause the sympathetic growth in total employment and population indicated by the ratios, then the base ratios will have withstood the test.

The past and future role of the urban economic base

theory is perhaps best described in the following statement:

The economic base principle is a fundamental truth that cannot be denied. As a result of critical examination and years of analysis it has been refined but it has not been overthrown.

There is no real dilemma confronting economic base analysis. The choice is between using all relevant statistics, now or in the future available, to calculate the value of imports and exports of urban communities, or to construct hypothetical models or equations for which the statistical data needed to provide answers to present day problems are lacking. The answer is simple. When the super-refined methods of analysis provide definite figures on basic and non-basic employment in specific urban areas, then the improved model will supplant the original mechanism. Such improved methods would not refute the fundamental principle of the economic base: they only measure basic and non-basic activities with a slightly greater degree of accuracy.¹

¹³Homer Hoyt, "Homer Hoyt and the Dilemma of Urban Economic Base Analysis: A Rejoinder," Land Economics, XXXVIII (February, 1962) 70.

SELECTED BIBLIOGRAPHY

Articles

- Andrews, Richard B. "Historical Development of the Base Concept," Land Economics, XXIX (May, 1953), 161-167.
- _____. "The Problem of Terminology," Land Economics, XXIX (August, 1953), 263-268.
- _____. "A Classification of Base Types," Land Economics, XXIX (November, 1953), 343-350.
- _____. "The Problem of Base Measurement," Land Economics, XXX (February, 1954), 52-60.
- _____. "General Problems of Identification," Land Economics, XXX (May, 1954), 164-172.
- _____. "Special Problems of Base Identification," Land Economics, XXX (August, 1954), 260-269.
- _____. "The Problem of Base Delimitation," Land Economics, XXX (November, 1954), 309-319.
- _____. "The Concept of Base Ratios," Land Economics, XXXI (February, 1955), 47-53.
- _____. "Causes and Effects of Changes in the Base Ratios and the Ratio Elements," Land Economics, XXXI (May, 1955), 144-145; (August, 1955), 245-256; (November, 1955), 361-371.
- _____. "The Base Concept and the Planning Process," Land Economics, XXXII (February, 1956), 69-84.
- _____. "Urban Economics: An Appraisal of Progress," Land Economics, XXXVII (August, 1961), 219-227.
- _____. "Comment Re Criticisms of the Economic Base Theory," Journal of the American Institute of Planners, XXIV, (1958), 37-40.
- Alexander, J. W. "The Basic-Non-Basic Concept of Urban Economic Functions," Land Economics, XXXII (February, 1957), 69-84.

- Alexandersson, Gunnar. "City-forming and City-serving Production," Readings in Urban Geography, Edited by Harold M. Mayer and Clyde F. Kohn. Chicago: The University of Chicago Press, 1959, pp. 110-115.
- Blumenfeld, Hans. "The Economic Base of the Metropolis," Journal of the American Institute of Planners, XXI, (1955), pp. 114-132.
- Crosson, Pierre R. "Further Comment on Economic Base Theory," Land Economics, XXXVI (May, 1960), 197-201.
- Ferguson, C. E. "Statics, Dynamics, and the Economic Base," Techniques of Urban Economic Analysis, Edited by Ralph W. Pfouts. West Trenton, N.J.: Chandler-Davis Publishing Co., 1960, pp. 325-339.
- Gillies, James, and Grigsby, William. "Objections to the Economic Base Theory and An Alternative Theory," Journal of the American Institute of Planners, XXII (1956), 17-23.
- Gottlieb, Abe. "Planning Elements of an Inter-Industry Analysis: A Metropolitan Area Approach," Journal of the American Institute of Planners, XXII (1956), 230-236.
- Greenhut, Melvin L. "Comments on Economic Base Theory," Land Economics, XXXV (February, 1959), 71-75.
- Harris, Britton. "Comment on Pfouts's Test of the Base Theory," Journal of the American Institute of Planners, IV (1958), 233-237.
- Harris, Chauncy D. "A Functional Classification of Cities in the United States," Readings in Urban Geography, Edited by Harold M. Mayer and Clyde F. Kohn. Chicago: The University of Chicago Press, 1959, pp. 129-138.
- Heilbrun, James. "Urban Economics: Some Lessons from Gertrude Stein," Land Economics, XXXVI (August, 1960) 291-296.
- Hoyt, Homer. "Development of Economic Base Concept," Land Economics, XXX (May, 1953), 182-186.
- _____. "The Utility of the Economic Base Method in Calculating Urban Growth," Land Economics, XXXVII (February, 1961), 51-58.
- _____. "A Method for Measuring the Value of Imports into an Urban Community," Land Economics, XXXVII (May, 1961), 150-161.

- _____. "Homer Hoyt and the Dilemma of Urban Economic Base Analysis: A Rejoinder," Land Economics, XXXVIII (February, 1962), 70.
- Isard, Walter, and Kavesh, Robert. "The Input-Output Approach," American Journal of Sociology, LX (#2), 152-162.
- Isard, Walter, Kavesh, Robert, and Kuenne, Robert. "The Economic Base and Structure of Urban Metropolitan Region," American Sociological Review, XVIII (June, 1953), 137-321.
- Leven, C. L. "Measuring the Economic Base," Papers and Proceedings of the Regional Science Association, II (1956), 250-258.
- _____. "An Appropriate Unit for Measuring the Urban Economic Base," Land Economics, XXX (November, 1954), 369-371.
- Mattila, J. M., and Thompson, W. R. "The Measurement of the Economic Base of the Metropolitan Area," Land Economics, XXXI (August, 1955), 215-228.
- Mayer, H. M. "Urban Nodality and the Economic Base," Journal of the American Institute of Planners, XX (1954), 117-121.
- McNamara, Katherine "A Bibliography of Urban Base Studies," Land Economics, XXX (May, 1954), 186-188.
- Morrissett, Irving. "The Economic Structure of American Cities," Papers and Proceedings of the Regional Science Association, IV (1958), 239-256.
- Murdock, J. C. "Homer Hoyt and the Dilemma of Urban Economic Base Analysis: A Reply," Land Economics, XXXVIII (February, 1962), 66-69.
- Moyerman, Sue and Harris, Britton "The Economics of the Base Study," Journal of the American Institute of Planners, XXI (1955), 88-93.
- Nelson, Howard J. "A Service Classification of American Cities," Readings in Urban Geography, Edited by Harold M. Mayer and Clyde F. Kohn. Chicago: The University of Chicago Press, 1959, pp. 139-160.
- "Oskaloosa vs. the United States," Fortune, April, 1938.

Pfouts, Ralph W. "An Empirical Testing of the Economic Base Theory," Journal of the American Institute of Planners, XXIV (1958), 64-69.

_____. "Reply to Harris on Testing the Base Theory," Journal of the American Institute of Planners, XXIV, (1958) 238-243.

Pfouts, Ralph W., and Curtis, E. T. "Limitations of the Economic Base Analysis," Social Forces, XXXVI (May, 1958), 303-310.

Reiss, Albert. "Functional Specialization of Cities," Municipal Year Book. Chicago: The International City Manager's Association, 1957.

Roterus, Victor, and Calef, Wesley, "Notes on the Basic-Non-Basic Employment Ratio," Readings in Urban Geography. Edited by Harold M. Mayer and Clyde M. Kohn. Chicago: The University of Chicago Press, 1959, pp. 101-104

Schettler, R. L. "Relation of City Size to Economic Services," American Sociological Review, VIII (1943), 60-62.

Schechter, Henry B. "Cost-Push of Urban Growth," Land Economics, XXXVII (February, 1961), 18-31.

Seyfried, W. R. "Predicting the Economic Growth Potential of the Community," The Appraisal Journal, XXVI (January, 1958), 55-60.

Smith, Edward K. "A Guide to Economic Base Studies for Local Communities," The Bureau of Business and Economic Research, Northeastern University, Boston, Mass., 1955, 20 pages.

Stewart, Charles T. Jr., "Economic Base Dynamics," Land Economics, XXXV (November, 1959), 327-336.

Thomas, Morgan D. "The Economic Base and a Region's Economy," Journal of the American Institute of Planners, XXIII (1957), 86-92.

Tiebout, Charles. "The Urban Economic Base Reconsidered," Land Economics, XXXII (February, 1956), 95-99.

_____. "Harris vs Pfouts: A Third Party Note," Journal of the American Institute of Planners, XXIV (1958)

Ullman, Edward, and Dacey, Michael J. "The Minimum Requirements Approach to the Urban Economic Base," Papers and Proceedings of the Regional Science Association, VI (1960), 175-194.

Reports, Unpublished Material, and
Public Documents

Alexander, J. W. An Economic Base Study of Madison, Wisconsin. Wisconsin Commerce Papers. University of Wisconsin, School of Commerce, Bureau of Business Research and Service, (Vol. 1, #4), June, 1953, 98 pages.

Bureau of Business Research, The University of New Mexico, and Research Department, Federal Reserve Bank of Kansas City, Missouri. The Economy of Albuquerque, New Mexico, 1949, 57 pages.

Business Extension Service, Oklahoma State University. The Economic Factors of Stillwater and Payne County. A report prepared for the Oklahoma Department of Commerce and Industry. Stillwater, 1962, 85 pages.

_____. Metropolitan Comprehensive Plan Report, City of Stillwater, 1961, 87 pages.

_____. Boomer Lake Park Plan. Stillwater, 1961, 37 pages.

Crozier, James Robert. Economic Base of Cities and Their Rate of Growth. An Unpublished Master's thesis, The University of North Carolina, Department of City and Regional Planning, 1956, 71 pages.

U. S. Department of Commerce, Bureau of the Census. Census of the Population, 1960, General Social and Economic Characteristics, Vols. I and 38C.

_____. Census of the Population, 1960, General Population Characteristics, Vol. 38.

_____. Census of the Population, 1960, Number of Inhabitants, Vol. 38.

Tiebout, Charles. The Community Economic Base Study. Supplementary Paper No. 16. New York: The Committee for Economic Development, December, 1962, 86 pages.

VITA

Dorothy Louise Ochsner
Candidate for the Degree of
Master of Science

Thesis: THE ECONOMIC BASE THEORY AND ITS APPLICATION TO
THE CITY OF STILLWATER, OKLAHOMA

Major Field: Economics

Biographical:

Personal Data: Born in Oklahoma City, Oklahoma,
March 14, 1933.

Education: Was graduated from the University of
Oklahoma in June, 1959, with the degree of
Bachelor of Business Administration, with a
major in business management.

Employment Experience: Was employed by the University
of Oklahoma, Extension Division, from 1955 to
1959, as office manager in the Department of
Business and Industrial Services. From 1961 to
1963, was employed by the Department of Economics,
Oklahoma State University, College of Business,
as half-time instructor.