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AN EVALUATION AND APPLICATION OF THE MINIMUM
REQUIREMENTS METHOD OF ECONOMIC BASE ANALYSIS
TO THE DELINEATION OF THE FUNCTIONAL STRUCTURE
OF NEW ZEALAND URBAN
PLACES, 1971

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ABSTRACT

The basic-nonbasic dichotomy of functions performed by urban places, their relative importance in ensuring the existence and continued growth of urban places, and the problems encountered in their identification and measurement have been examined within the conceptual framework of the economic base concept. One of the indirect or macro methods of economic base analysis which has been used in the identification and measurement of the basic and nonbasic functions performed by urban places, namely the minimum requirements method and its variants, has also been examined and evaluated in order to provide a theoretical and methodological framework for the application of the second variant of the method to 82 New Zealand urban places. On the basis of the Department of Labour's April, 1971 half-yearly survey of employment statistics, the second variant of the minimum requirements method as developed by Ullman and Dacey and refined by the use of least-squares linear regression equations and their associated regression lines which systematically correct the results obtained for variations in urban place population size, has been used to identify and measure the basic and nonbasic functions performed by New Zealand urban places. Using the basic functions, which are generally considered predominantly of economic significance, as a quantitative measure of the extent to which each of the industrial categories represented in the employment structure of an urban place constitute an economic specialisation of the urban place; the complex of specialised functions characteristic of each urban place in New Zealand has been used to delineate the functional structure of the urban place. To clarify these results and provide a comparative indicator, reference has been made to several direct

or micro economic base studies which have applied the sales-employment conversion method of economic base analysis to individual New Zealand urban places, and to a number of overseas economic base studies which have applied the minimum requirements method and its variants to various national and regional systems of urban places. Finally, to obtain an overview of the New Zealand urban scene the basic functional structures of New Zealand urban places have been characterised and classified. Each urban place's dominant function, its distinctive functions, and its degree of functional specialisation have been determined to achieve this end in a similar manner to Maxwell's functional classification of Canadian cities. The results of this classification have been presented in tabular and cartographic form, discussed in terms of their spatial patterns and statistical aspects, and compared with several functional classes derived by Pownall in his earlier functional classification of New Zealand towns. The overview gained indicates the predominantly multi-functional basic character of the functional structures of New Zealand urban places.

PREFACE

The extent and complexity of urbanisation in New Zealand provide ample justification for urban research. Interest in such research, however, has only recently begun to gather momentum, and while existing studies of New Zealand's urban geography provide some coverage, this is far from complete. Consideration is therefore given in this present study to the improvement of fundamental knowledge in one area of ignorance which has been identified, namely the economic base aspects of the functional structure of New Zealand urban places.

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CHAPTER I

INTRODUCTION

The Study of Urbanisation in New Zealand

"There is an often-noted paradox in the spatial patterns of economic activity and population in New Zealand: although the country's economic well-being clearly depends on the productivity and profitability of its rural, primary industries, the majority of its inhabitants are town-dwellers" (Johnston, 1973b,3).

Indeed, New Zealand is one of the most highly urbanised countries in the world in terms of population distribution, and this is not a recent phenomenon. Its urban places,¹ originally established by a colonial power as administrative centres and transfer points for expediting the export of the colony's resources, have developed into a national urban system inside which four out of every five New Zealanders live. This was clearly illustrated by the 1971 census, which indicated that 81.5 per cent of the nation's population were urban dwellers.

The process of urbanisation however, involves much more than merely population redistribution, and therefore it is appropriate that urban research be directed towards the improvement of fundamental knowledge of each of its three separate dimensions: structural, behavioural and demographic.² Such research is necessary, not only to give a better appreciation of past and present patterns and processes of urbanisation in New Zealand, but also to give a basis for the future. This need for research into the process of urbanisation in New Zealand is simply justified by Johnston (1973b,3), who points out,

"Urbanisation.....is a complex process involving many aspects of life, and is a worthy subject of study in a highly urbanised society such as New Zealand."

Relevant Urban Research

It is apparent from the preceding discussion that the extent and complexity of urbanisation in New Zealand provide ample justification for urban research. Interest in such research however, has only recently begun to gather momentum, and while existing studies of New Zealand's urban geography provide some coverage of each of the three dimensions of urbanisation, this is far from complete.³ Indeed, it is possible to identify many areas of ignorance with respect to each of these three dimensions which remain unresearched.

Therefore it is appropriate, that consideration be given in this present study to the improvement of fundamental knowledge in one such area of ignorance which has been identified with respect to the structural dimension of urbanisation, namely the economic bases of New Zealand urban places. This gap in the knowledge of New Zealand urban places was initially identified by Mayer (1962,14), and later mentioned by Watters (1965c,208), who suggested that studies were ".....needed on the basic-nonbasic aspects of the functional structure of New Zealand towns."

"Structurally, each urban place performs certain functions, since no one is self-sufficient" (Johnston, 1973c, 175). The functions performed by urban places have been extensively studied by overseas geographers, economists and planners, and as a result of their research, a dichotomy of urban place functions is generally recognised.⁴ Those functions which are performed for the population inside the urban place are termed "nonbasic", while those performed

for the population outside the urban place are termed "basic".⁵ Since the basic functions are generally considered predominantly of economic significance, economic base studies⁶ have been of concern in urban analysis, and a large number of methods have been developed and applied in such research (see Chapter 2). All of these methods involve measures of the extent to which each function in turn constitutes an economic specialisation of the particular urban place; the complex of specialised functions characteristic of each urban place in a set of urban places, such as that of a nation or region, has been used to indicate the essential functional structure of the urban place, as well as to classify urban places by their functions (Mayer, 1969b, 10). It is assumed in these methods of economic base analysis that the local needs of the urban place will be satisfied before export occurs. This, of course, is not strictly true, but if any type of good or service is exported before local needs are met, at least an equal volume of imports of similar goods and services takes place, and an equilibrium is attained. The surplus beyond that level is then indicative of the basic functions, and the extent of such surplus is indicative of the functional structure of the urban place, that is, its economic specialisations. These considerations, which form the essence of economic base analysis, constitute the crux of this present study of New Zealand urban places.

To date, almost all the research undertaken in New Zealand pertaining to urban place functions, has focussed on only the central place functions of urban places.⁷ The exceptions to this include the studies by Pownall (1953, 332-350), who used simple percentage deviations above the national mean values for seven functional categories, and by Johnston (1973c, 175-203), who employed location quotients greater than

unity for seventy-one industrial categories; calculated on the basis of the statistical data collected by the Department of Labour in its half-yearly surveys of employment in each of New Zealand's urban places with a population of 1,000 or more;⁸ to identify and measure the complex of specialised, central place and non-central place functions characteristic of each urban place, as a preliminary to classifying New Zealand urban places by their functional specialisations.

The methodologies employed in these two studies of New Zealand urban place functions are somewhat different however, from those of economic base analysis, which do not seem to have found wide acceptance in New Zealand. In fact, the only economic base studies carried out in New Zealand, have been those of Hamilton by Blechynden (1962; 1964, 122-137), Rotorua by Lowe (1966), and Stratford by Laidlaw (1968).⁹ Each of these studies applied a direct or micro method of economic base identification and measurement to individual New Zealand urban places. As yet, no research has attempted to apply an indirect or macro method of economic base identification and measurement to the urban places constituting New Zealand's urban system.

Objectives and Organisation

The preceding considerations stimulated this present study, and provided its objectives and its organisation.

Objectives

1. An examination of the functions performed by urban places, their relative importance in ensuring the existence and continued growth of urban places, and the problems encountered in their identification and measurement, within the conceptual framework of the economic base concept.

2. An examination and evaluation of an indirect or macro method of economic base identification and measurement, namely the minimum requirements method and its variants, in order to provide a theoretical and methodological framework for the application of the second variant of the minimum requirements method to New Zealand urban places.
3. An application of the second variant of the minimum requirements method as developed by Ullman and Dacey (1960, 175-194) in their analysis of the economic base of United States cities to the delineation of the functional structure of New Zealand urban places.

Organisation

Chapter Two is concerned with a theoretical examination of the functions performed by urban places within the conceptual framework of the economic base concept. The basic-nonbasic dichotomy inherent in the economic base concept is used to examine the functions performed by urban places. This dichotomy is illustrated by means of a series of simple diagrammatic models which are based on the relationships implied in the economic base concept. The relative importance of the basic and nonbasic functions in ensuring the existence and continued growth of urban places is then considered with respect to the assumption of causation implicit in the economic base concept. Finally, the problems encountered in the identification and measurement of the basic and nonbasic functions in terms of the selection of a spatial unit of reference, a unit of measurement, and an overall method of economic base analysis are outlined.

Chapter Three deals with an examination and evaluation of the minimum requirements methods and its variants in order to provide a

theoretical and methodological framework for the application of the second variant of the method to New Zealand urban places in Chapter Four. The theoretical bases of the minimum requirements method and its variants, the hypothetical, normative models of the urban place economy assumed in each of these methodological concepts, and the dependence of the magnitude of the basic and nonbasic functions on the variant of the method used, together with a number of other variables, especially urban place population size, are examined and evaluated. Finally, the theoretical and practical limitations of the minimum requirements method as well as its advantages are discussed.

Chapter Four involves the application of the second variant of the minimum requirements method as developed by Ullman and Dacey (1960,175-194) in their analysis of the economic base of United States cities to the delineation of the functional structure of 82 New Zealand urban places. This particular method was selected on the basis of the type of comparative research undertaken in this present study and the availability of relevant statistical data, as the most appropriate method of economic base analysis for this purpose. The type of results obtainable from the use of this method in a context other than the United States, in terms of the way it measures the extent to which each of the functions represented in a New Zealand urban place constitute an economic specialisation of the urban place, and identifies the complex of specialised functions characteristic of each New Zealand urban place in order to delineate its functional structure, are outlined. To clarify these results and provide a comparative indicator, reference is then made to those New Zealand economic base studies of Hamilton by Blechynden (1962; 1964,122-137), Rotorua by Lowe (1966), and Stratford by Laidlaw (1968), which have

employed direct or micro methods of economic base analysis, and to a number of overseas economic base studies which have applied the two variants of the minimum requirements method to various regional and national systems of urban places.

Chapter Five classifies the results obtained from the application of the second variant of the minimum requirements method to New Zealand urban places in Chapter Four. These results pertaining to the specialised functions characteristic of each of the 82 New Zealand urban places examined are used to classify each New Zealand urban place by its dominant function, its distinctive functions, and its degree of functional specialisation, in a similar manner to Maxwell's (1965,79-104) functional classification of Canadian cities. The results of this classification are presented in a tabular and cartographic form similar to that adopted by Pownall (1953,332-350), and are discussed both in terms of their statistical aspects and their spatial characteristics. To clarify these results and provide a comparative indicator, reference is also made to the comparable elements of Pownall's (1953,332-350) functional classification of New Zealand urban places.

Chapter Six which is the concluding chapter, briefly presents a number of observations pertaining to the value of the economic base concept, and in particular the second variant of the minimum requirements method of economic base analysis in the study of New Zealand urban places.

Footnotes

1. For the definition of the term "urban places" as applied in this present study, see Appendix B, footnote 1.
2. These three separate dimensions of the process or urbanisation

have been identified by Johnston (1973b,3-14; 1973d,78-81) and Webb (1973a,325-335) in their studies of urbanisation in New Zealand drawing on the initial formulation by Lampard (1965, 519-520).

3. Most of the studies of New Zealand's urban geography published prior to 1969 are indicated on a chronological basis in Johnston's (1969,121-135) discussion of urban geography in New Zealand. While most of those published after 1969 are referred to in "Urbanisation in New Zealand", a collection of review essays edited by Johnston (1973a), which presents a general overview of the present state of knowledge of the patterns and processes of urbanisation in New Zealand.
4. In this present study, "urban functions" are applied as a term describing those economic activities which are characteristically carried out in urban places, the presence of which may be used to indicate the existence of an urban place.
5. For a glossary of equivalent economic base terms see Appendix A.
6. Literature dealing with economic base studies is extensive and well balanced. Following Hoyt's pioneering of the economic base concept in its modern form in the late 1930's and 1940's, numerous empirical and theoretical contributions have been made by geographers, economists and planners, and although these are not always readily accessible, most are discussed in the following reviews of the development of the economic base concept, see Alexander (1953,9-11; 1954,246-261), Alexandersson (1956), Andrews (1953a,161-167), Blumenfeld (1955, in Pfouts, 1960,229-277), Borchert and de Smidt (1967,64), Chapin (1965,

107-157), Dziewonski (1967,139-145), Hoyt (1941,188-195; 1954, 183-184), Isard (1960,189-205), Jerczynski (1971, in Spanish translation by Chaves, 1973), Lane (1966,339-347), Massey (1971), Mayer (1965,84), Mayer and Kohn (1959,85-126), Murphy (1966,98-112), Pfouts (1960), Richardson (1970,11), Thomas (1957,86-92), Tiebout (1956a,95-99; 1962), Ullman, Dacey and Brodsky (1971), Yeates and Garner (1971,118-137). Comprehensive lists of economic base studies may be found in the bibliographies on the economic base concept compiled by de Smidt (1967,70-82) and McNamara (1954,186-191).

7. The central place functions performed by urban places are undoubtedly the most important for the majority of New Zealand urban places. For several studies which have been made to identify and measure the relative importance of each urban place in New Zealand's urban system, see Duncan (1955,119-138), Forrest (1968,61-75; 1973,96-107), King (1962a,50-71), Pownall (1957,332-350), White (1972,36-50). For more detailed studies which have been carried out on the central place functions of urban places in Canterbury, see King (1962b,139-149) and in Waikato, see Whitelaw (1962,72-92).
8. The procedures adopted by the Department of Labour for the collection, processing and presentation of employment statistics for each of New Zealand's urban places with a population of 1,000 or more, are outlined in Appendix C.
9. In this present study, "economic base studies" are applied as a term describing those studies which employ the concept underlying economic base analysis. Although it needs no argument that it is very difficult to delimit the exact field of the economic base concept (see Chapter 2), to avoid confusion

Andrews (1953b,263-268) has drawn a useful distinction between, on the one hand, "economic base studies" and, on the other, "economic surveys". In his article, Andrews indicated that many studies do use the term "economic base study", while in fact the analyses concerned are not more than general economic surveys. Such general economic surveys are much more systematic analyses, Andrews suggested, than studies using the concept underlying economic base analysis.