A CRITICAL REASSESSMENT OF THE EVIDENCE OF LONG SWINGS IN RESIDENTIAL CONSTRUCTION IN GREAT BRITAIN, 1860-1914.
WITH SPECIAL EMPHASIS ON THE LOCAL EXPERIENCE IN LANCASHIRE AND SOUTH WALES

by

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We accept this thesis as conforming to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
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ABSTRACT

This thesis examines the evidence of long swings in British house-building from 1860 to 1914.

The central issue of the present inquiry concerns the existence of cyclical fluctuations in residential construction and the nature of the causal mechanisms by which these phenomena might be explained.

A general analysis of the structure of the housing market and the institutional peculiarities which give rise to the lagged adjustment process by which changes in demand are translated into changes in the supply of housing accommodation suggests that the appropriate level at which to analyze the behavior of house-building is the regional or local level. The importance of specifying relationships whose underlying behavioral implications are consistent with the level of aggregation, is stressed.

With this in mind, a general regional model of house-building activity is developed and its theoretical solutions explored. This provides a conceptual analytical framework used subsequently to study the regional (and local) house-building experience of South Wales and South-east Lancashire.

These disaggregated regional studies show local patterns
of residential construction to exhibit a wide range of variation. Operative causal mechanisms found to exist at this level of analysis disclose significant regional differences which seriously question the validity of the macro-causal relationships which have been offered to explain fluctuations in British house-building.

The limits of the present analysis and the tentative nature of our conclusions are emphasized. With this in mind, there are suggested a number of areas which require far more intensive study than they have received in the past. Only when we learn more about the inter-relationships in the pattern of regional development will we be able to more fully understand the mechanisms of the long swings.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>II.</td>
<td>FLUCTUATIONS IN BUILDING ACTIVITY: EVIDENCE OF LONG SWINGS IN RESIDENTIAL CONSTRUCTION</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>A. A Measure of Building Activity</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>B. The Time-Path of Residential Construction in Great Britain, 1860-1914</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>C. The Course of Rural House-Building in Great Britain, 1860-1914</td>
<td>25</td>
</tr>
<tr>
<td>III.</td>
<td>THE CAUSES OF LONG SWINGS IN HOUSE-BUILDING</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>A. The Structure of the Housing Market</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>B. Major Sources of Instability in the Housing Sector of the Economy</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>C. Why the Long Swings in British House-Building from 1860 to 1914</td>
<td>57</td>
</tr>
<tr>
<td>IV.</td>
<td>THE PROBLEM OF AGGREGATION: REGIONAL AND LOCAL BUILDING CYCLES</td>
<td>93</td>
</tr>
</tbody>
</table>

LIST OF TABLES ........................................ vii
LIST OF FIGURES ........................................ x
ACKNOWLEDGEMENT ........................................ xii
A. Regional and Local Differences in the Course of House-Building Activity ........................................... 93

B. A Regional Model of House-Building ................................................................. 97

C. Implications of the Regional Model for the Course of House-Building at the National Level ............................................. 107

V. RESIDENTIAL CONSTRUCTION IN THE SOUTH WALES COALFIELD ............................................. 114

A. A Regional Index of House-Building in South Wales ............................................. 114

B. Differences Between the Course of House-Building in Great Britain and the South Wales Coalfield ............................................. 118

C. House-Building and the Economic Development of South Wales ............................................. 120

D. Demographic Factors and the Course of House-Building in South Wales: Further Evidence of the Absence of Regional Long Swings in Residential Construction ............................................. 148

E. Variations in the Course of House-Building at the local Level: South Wales ............................................. 161

VI. RESIDENTIAL CONSTRUCTION IN SOUTH-EAST LANCASHIRE ............................................. 196

A. A Regional Index of House-Building in South-East Lancashire ............................................. 196
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Differences Between the Course of House-Building in Great Britain and South-East Lancashire</td>
<td>200</td>
</tr>
<tr>
<td>C. House-Building and the Economic Development of South-East Lancashire</td>
<td>202</td>
</tr>
<tr>
<td>D. Demographic Factors and the Course of House-Building in South-East Lancashire</td>
<td>237</td>
</tr>
<tr>
<td>E. Variations in the Course of House-Building at the Local Level: South-East Lancashire</td>
<td>248</td>
</tr>
<tr>
<td>VII. SOME CONCLUSIONS AND THEIR IMPLICATIONS FOR FURTHER STUDY OF HOUSE-BUILDING IN VICTORIAN BRITAIN</td>
<td>266</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>274</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>281</td>
</tr>
<tr>
<td>I.</td>
<td>281</td>
</tr>
<tr>
<td>II.</td>
<td>289</td>
</tr>
<tr>
<td>III.</td>
<td>298</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>I.</td>
<td>LONG CYCLES IN BUILDING ACTIVITY IN GREAT BRITAIN</td>
</tr>
<tr>
<td>II.</td>
<td>CHANGES IN URBAN AND RURAL HOUSING STOCK IN ENGLAND AND WALES 1851-1911</td>
</tr>
<tr>
<td>III.</td>
<td>GROWTH OF PRODUCTION AND EXPORT OF COAL, UNITED KINGDOM 1860-1914</td>
</tr>
<tr>
<td>IV.</td>
<td>PROPORTION OF TOTAL COAL EXPORTS FROM PRINCIPLE DISTRICTS OF THE UNITED KINGDOM 1860-1900</td>
</tr>
<tr>
<td>V.</td>
<td>SAILING AND STEAM TONNAGE ENTERED WITH CARGO AND IN BALLAST AT PORTS IN THE UNITED KINGDOM</td>
</tr>
<tr>
<td>VI.</td>
<td>LIMITED COMPANIES (COAL MINING) REGISTERED IN SOUTH WALES AND THE AVERAGE SELLING PRICE PER TON OF STEAM COAL F.O.B. CARDIFF (1860-1875)</td>
</tr>
<tr>
<td>VII.</td>
<td>NET GAIN OR LOSS THROUGH MIGRATION: ENGLAND, SCOTLAND AND WALES, DECENNially, 1861-1911</td>
</tr>
<tr>
<td>VIII.</td>
<td>INTERNAL MIGRATION BALANCE: WALES DECENNially, 1861-1911</td>
</tr>
<tr>
<td>IX.</td>
<td>MIGRATION BALANCES IN ENGLISH AND WELSH COLLIERY REGIONS, DECENNially 1861-1911</td>
</tr>
</tbody>
</table>
Table | Page
--- | ---
X. POPULATIONS OF THE MERTHYR AND ABERDARE VALLEYS, DECENNIALLY 1861-1891 | 186
XI. LOCATION OF THE COTTON INDUSTRY IN ENGLAND AND WALES, 1835-1921 | 204
XII. CHANGES IN THE NUMBER OF FACTORIES, POWER-LOOMS, SPINDLES AND PERSONS EMPLOYED IN THE COTTON INDUSTRY OF ENGLAND AND WALES, 1858-68 | 210
XIII. RELIEF EXPENDITURES BY THE GUARDIANS AND RELIEF COMMITTEES 1860-1965 | 215
XIV. NUMBER AND NOMINAL CAPITAL OF LIMITED LIABILITY COTTON MILLS PROJECTED IN 1873-1884 | 228
XV. NATIONAL INDICES OF BUILDING ACTIVITY IN GREAT BRITAIN, 1860-1914 | 284
XVI. NET INCREASES IN THE HOUSING STOCK AND THE NUMBER OF HOUSES BEING CONSTRUCTED ON CENSUS DAY IN ENGLAND AND WALES, 1861-1911. | 287
XVII. HOUSE-BUILDING DATA FOR SELECTED TOWNS IN SOUTH WALES | 292
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>XVIII. INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN SOUTH-EAST LANCASHIRE 1860-1913</td>
<td>299</td>
</tr>
<tr>
<td>XIX. NATURAL INCREASE AND MIGRATION POPULATION AGED 20-44, LANCASHIRE AND CESHIRE 1870-1910</td>
<td>305</td>
</tr>
<tr>
<td>XX. TOTAL NUMBER OF HOUSES ASSESSED AND NOT ASSESSED TO DUTY</td>
<td>306</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>NATIONAL INDICES OF BUILDING ACTIVITY, GREAT BRITAIN 1860-1914</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>NET INCREASE IN URBAN, RURAL AND TOTAL HOUSING STOCK IN CENSUS DECADES ENGLAND AND WALES 1861-1911</td>
<td>29</td>
</tr>
<tr>
<td>3.</td>
<td>THE HOUSING AND MORTGAGE MARKET</td>
<td>41</td>
</tr>
<tr>
<td>4.</td>
<td>HOUSE-BUILDING INDICES FOR GREAT BRITAIN AND SOUTH WALES</td>
<td>116</td>
</tr>
<tr>
<td>5.</td>
<td>INDICES OF LONG SWINGS IN WALES AND THE &quot;ATLANTIC ECONOMY&quot;, 1860-1914</td>
<td>121</td>
</tr>
<tr>
<td>6.</td>
<td>INDICES OF HOUSE-BUILDING AND THE GROWTH OF INDUSTRY AND TRADE IN SOUTH WALES</td>
<td>140</td>
</tr>
<tr>
<td>7.</td>
<td>DECENNIAL NET GAIN OR LOSS THROUGH MIGRATION: ENGLAND, WALES AND SCOTLAND 1861-1911</td>
<td>151</td>
</tr>
<tr>
<td>8.</td>
<td>DECENNIAL TRENDS IN HOUSE-BUILDING AND MIGRATION: SOUTH WALES, ENGLAND AND SCOTLAND, 1861-1911</td>
<td>158</td>
</tr>
<tr>
<td>9.</td>
<td>INDICES OF HOUSE-BUILDING FOR SIXTEEN TOWNS IN SOUTH WALES 1860-1914</td>
<td>165</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>10.</td>
<td>HOUSE-BUILDING INDICES FOR GREAT BRITAIN AND SOUTH-EAST LANCASHIRE</td>
<td>199</td>
</tr>
<tr>
<td>11.</td>
<td>INDICES OF ECONOMIC DEVELOPMENT IN SOUTH-EAST LANCASHIRE</td>
<td>219</td>
</tr>
<tr>
<td>12.</td>
<td>MIGRATION, NATURAL INCREASE AND HOUSE-BUILDING IN LANCASHIRE 1871-1913</td>
<td>240</td>
</tr>
<tr>
<td>13.</td>
<td>MARRIAGE AND BIRTH RATES (PER 1000 POPULATION) ENGLAND AND WALES 1860-1910</td>
<td>246</td>
</tr>
<tr>
<td>14.</td>
<td>INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN SOUTH-EAST LANCASHIRE 1860-1914</td>
<td>250</td>
</tr>
<tr>
<td>15.</td>
<td>HOUSE-BUILDING IN GREAT BRITAIN ANNUALLY AND IN ENGLAND AND WALES ON CENSUS DAY, 1860-1911</td>
<td>288</td>
</tr>
</tbody>
</table>
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CHAPTER I

INTRODUCTION

Any analysis of house-building must of necessity be a complex undertaking by virtue of the phenomena it seeks to explain. This holds a fortiori if the analysis also happens to be historical. Originally, this paper was projected as an econometric study of house-building in Great Britain from 1860 to 1914. However, as I learned more about econometrics and the peculiar structure of the housing market, it became increasingly apparent that this was an inappropriate way to approach the subject of this paper.

The proper specification of an econometric model which is to be used for the purpose of analyzing an historical problem, requires that its underlying behavioral implications be consistent with historical fact. This consideration took me to the available literature on the course of British house-building in the nineteenth century. A survey of what proved to be a not too extensive body of knowledge, but which included the few disaggregated studies of residential construction in Great Britain that have only recently appeared, has convinced me that far more intensive study is required at the regional and local level than has hitherto been undertaken.
The housing market by its very nature, is a local market, and the mechanism of the building cycle can be properly explained only in the context of a local or regional economy. This is the central issue of the present paper. There are times when national or international factors such as food prices, interest rates, war, etc., have a favorable or unfavorable influence on house-building throughout the country. Yet, in the final analysis "there can be no national building boom without there being at least one local boom, and the justification for a local boom must lie in local need."\(^1\)

Herein lies the apparently insurmountable difficulty facing the econometrician. Attempts to relate the aggregate level of building activity to national indices of income, rent, population and building costs may give a good fit, but if the real behavioral relationships are inconsistent with the level of aggregation, then our perception of the operative mechanisms giving rise to long swings in residential construction may be seriously misguided. A simple example will illustrate

the problem. Consider a country consisting of two clearly defined regions, where internal migration is such that one region is experiencing a net inflow of population; total national population remaining unchanged. Assume further that the expanding region undergoes an upswing in house-building activity in response to the growing demand for housing accommodation, while the burden of empty houses in the declining region causes a local depression in the building industry there. An aggregative model must now explain the national course of house-building activity in terms of stationary total population data and perhaps other variables. It might very well explain the influence of these other variables, but its failure to account for the internal redistribution of population will inevitably falsify our interpretation of what is happening.

Another problem concerns the availability of data at the local level. If we had information on population structure, vacancies, interest rates, building costs, rents and incomes for each region, we could estimate regional models. This would allow us to account for different regional behavioral assumptions, and subject them to rigorous testing. The difficulty here is that almost all of our data is in the form of aggregate national series. There is very little information let

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2 This example is drawn from Lewis, pp. 532-3.
alone complete statistical series on local rent levels, vacancies, incomes or population. We are thus faced with further grim prospects for the construction of regional or local econometric models of house-building activity.

The purpose of the present paper is to study in greater detail the regional house-building experience of South Wales and South-east Lancashire and their relationship to the national pattern. In Chapter II we survey the course of house-building in Great Britain from 1860 to 1914. Special attention is devoted to the time-shape of building activity and in particular the evidence of long swings in residential construction.

Chapter III discusses at some length the causes of long swings in residential construction.

Chapter IV is concerned with the problem of aggregation and the necessity of analyzing building cycles within their natural i.e. local or regional, setting. A general regional model of house-building is outlined and its implications for the national pattern discussed.

The regional course of house-building in South Wales is the subject of Chapter V. Our emphasis is on defining the relationships between house-building and the economic and demographic development of the regional economy. We also discuss
the long swing and local variations in building patterns within the region.

Chapter VI is a similar study of house-building in South-east Lancashire. Again we stress the course of regional development and its impact on residential construction.

A concluding statement will be found in Chapter VII.
CHAPTER II

FLUCTUATIONS IN BUILDING ACTIVITY: EVIDENCE OF LONG SWINGS IN RESIDENTIAL CONSTRUCTION

A MEASURE OF BUILDING ACTIVITY

An index of fluctuations in private building activity was required as a basis for the present study. A wealth of information on residential building was originally collected by municipal authorities, primarily to satisfy the requirements of local building by-laws. And although much of the historical record has failed to survive the test of time and bureaucratic procedure, a good many local registers remain intact and it was to these that Bernard Weber and J. Parry Lewis turned to construct their indices of residential construction in Great Britain. These records provide the most satisfactory data upon which to base such an index.


3 John R. Riggleman, "Building Cycles in the United States, 1875-1932", Journal of the American Statistical Association, Vol. XXVIII., (June, 1933), pp. 131-153. We might conclude with Mr. Riggleman that "in spite of the ... limitations, however, it is quite probable that few industries have a better index of activity over a long period of time than the building industry has in building permits." Building permits in the U.S. are, of course, the counterpart of approved building plans and erections in Great Britain.
Generally, before a building could be constructed, it was necessary for the builder to submit building plans to the City Surveyor or Engineer for approval. The local official approved the plans if they conformed to the requirements of the building by-laws. Records were kept not only on approved plans, but in some cases on houses actually erected.

These records are, however, subject to many limitations. For example, as urban boundaries changed building series applied progressively to larger and larger areas. Although this raises the issue of discontinuities in the series, Weber claims that "inspection of the building series in years in which some of the larger extensions occurred indicates, moreover, no obvious discontinuities."\(^4\) Another problem concerns the definition of a "house". This probably not only differed from region to region, but also was subject to change over the half century with which we are concerned. The general tendency, however, that we find before 1914 was to follow the

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definition used by the Census of Population.

Other data problems refer specifically to the nature of the building industry. An approved plan places the builder under no obligation to complete the building for which the plan was approved. Work may never take place under some approved plans, due to difficulties such as those that often occur in a period of depression. Also, if building by-laws are expected to change—to become more rigid—then builders may have a large number of plans approved hoping to use them later to construct buildings under the older liberal regulations. There is also a time-lag between the approval of plans and the time when construction begins on the actual house. Thus, there are a number of reasons why building plan statistics overstate the amount of actual building.

In constructing the building index presented in Figure 1, Weber adjusted for many of the problems mentioned above in the following way:

"In order to render comparable the data relating to houses actually erected and the data of plans it has been assumed that it took six months to build a house and that plans approved in a given year were implemented in the year ending six months later. It was further assumed that 10 per cent of the annual building plans failed to be executed, this percentage being an estimate formed from inspection of the statistics of plans
and completed houses for a few towns for which both are available over a period of years. Finally, all series given in financial years were converted to calendar years".  

Weber compiled series of statistics for 34 towns. Twenty-six of these refer to "houses erected" while the remaining 18 refer to the number of houses on approved building plans. These were then used to construct an index of house-building activity in Great Britain from 1856 to 1950. This index, for the years 1860 to 1914, is presented graphically as the building curve (A) in Figure 1. The actual number of houses erected in Great Britain was then estimated on the basis of this index. The interested reader will find a brief summary of the methods employed by Weber in constructing his index in Appendix I of the present paper.

One further limitation of these statistics should be mentioned, although it is quite obvious. The index is based on urban areas and fails to take into account building on farms and in small rural villages. Weber, however, devotes a section of his paper to the course of rural house-building. He argues that by applying a slight correction factor to the index

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5 Ibid, p. 109
6 Ibid, pp. 119-122.
Figure 1

NATIONAL INDICES OF BUILDING ACTIVITY
GREAT BRITAIN 1860-1914

(A) Weber index of house-building in thirty-four towns, 1860-1914. 1900-09=100. See Table XV, Appendix I.

(B) Lewis Weighted index of house-building activity in Great Britain, 1860-1914. 1901-11=100. See Table XV, Appendix I.

(C) Cairncross index of the volume of residential building in Great Britain, 1870-1914. 1907=100. See Table XV, Appendix I.

(D) Inhabited house-duty statistics; annual increase in the number of premises (in 000's) assessed and not assessed to duty in Great Britain, 1875-1914. See Table XV, Appendix I.

(E) Net increase in housing stock as reported in the decennial census of population, England and Wales, 1861-1911. 1901-11=100. See Table XVI, Appendix I.
in the period 1891-1913, it can be made broadly represent­
ative of the course of total national house-building acti-
vity. The existence of data was the primary factor determ-
ining the regional representation of the building series.
However, "most of the major geographical areas, such as Lan-
caster, Yorkshire, Scotland, Wales, the Midlands, and the
South are in some way represented, although some are under-
represented while others are perhaps over-weighted." I
have included in Appendix I a list of the towns whose house-
building statistics were used in constructing Weber's index
of residential construction.

The best alternative measures of building fluctuations
in Great Britain in the late Victorian period have also been
presented in Figure 1. Curve (B) is a weighted average of
four regional indices of building activity constructed by
J. Parry Lewis. 8 The regional indices are based not only on
the statistics compiled by Weber, but also on data for towns
not included in Weber's study that have been collected since
1955. These were then combined using weights representing
the proportion of the net national increase in the housing


8 Lewis, "Indices of House-Building", pp. 148-149. From all
the available data, the following "regional" indices were
constructed; the Manchester Conurbation index, the South Wales
index, the London index, and an aggregate index of "all other
towns".
stock from 1901-1911 contributed by each individual region. The weights calculated by Lewis were: London, 16.3; South Wales, 5.5; Manchester Conurbation, 8.6; and "Other Towns", 69.6. A comparison of curves (A) and (B) in Figure 1 indicates that the incorporation of new building data and the use of reasonable alternative weighting techniques does not appreciably alter the time-shape of residential construction originally established by Weber's index.

Curve (C) is an index of the volume of residential building compiled by A.K. Cairncross for his study of home and foreign investment in Great Britain from 1870 to 1913. For the years 1870 to 1900 he relied heavily on the Inhabited House Duty statistics. Using benchmark estimates of the number of houses built in England and Wales in 1871 and 1891, the net increase in housing stock between revaluation years as indicated by the Inhabited House Duty statistics for England, Wales, and Scotland was "smoothed ... in order to make the changes from year to year conform to the other evidence." For the years 1901 to 1914, a base series of

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houses erected was constructed from data on Greater London and the forty largest municipal areas in England and Wales. To obtain an estimate of all houses built in urban areas outside London, the data on municipal areas was multiplied by a factor of 21/2. Cairncross then added a constant 20,000 dwellings a year for rural areas and increased the total series by one-eight to account for Scotland. The final series of new houses built in Great Britain from 1870 to 1914 was converted to the index (1907=100) graphed in Figure 1. Again, the basic shape of the building curve with its long swings in residential construction is confirmed.

In 1851 the window tax was repealed in Great Britain and replaced by the Inhabited House Duty levied on dwelling houses whose annual "rental" value was twenty pounds sterling or more. From 1875 to 1914 the Inhabited House Duty records also include data on houses not charged with duty as well as "messuages and tenements not used as dwellings." For the present study I have constructed a series representing the total number of houses charged and not charged to duty from 1875 to 1914. By taking first differences of the estimates in this series, a new series measuring the annual increases

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in the housing stock was derived. This is presented as Curve (D) in Figure 1.

The Inhabited House Duty statistics have been used in numerous studies of building fluctuations yet often inappropriately. It is important to keep in mind a number of limitations which may seriously reduce their usefulness. Both Mitchell\textsuperscript{12} and Weber\textsuperscript{13} have drawn attention to the fact that the figures in the IHD records are net quantities and consequently much new house-building is not accounted for because of demolitions. This particular problem could be overcome if we had adequate information on the annual rate of demolition or could reasonably assume it to be a relatively constant percentage of the housing stock. This, however, is presently not possible. What little evidence there is on demolitions leads one to conclude that they varied significantly over time and were not clearly related to the level of housing stock or building fluctuations in any systematic way. Another problem that arises from the IHD statistics concerns the influence of periodic reassessments. The reassessment years for London were 1876, 1881,


\textsuperscript{13}Weber, "A New Index of Residential Construction", p. 106.
1887, 1892, 1897, 1902, 1907 and 1912; for the rest of England and Wales they were 1876, 1879, 1882, 1885, 1888, 1893, 1898. In Scotland the process of reassessment in effect took place each year. Increases in rent were accounted for only in reassessment years while reductions were adjusted for annually. This dissimilar treatment of rent increases and decreases created a downward bias in figures of annual valuation for inter-assessment years. For the statistics on the number of houses this only caused a problem in so far as it led to a continuous shift of buildings from one category to another.

These limitations render the House Duty statistics a relatively poor measure of annual changes in house-building. However, we may agree with Thomas that "this does not necessarily rule them out as an indication of the time-shape of house-building." To test their reliability in this respect I have superimposed building curve (D) in Figure 1 on a curve which represents Weber's estimates of the number


(in thousands) of houses erected in Great Britain. The effect of the periodic reassessments is striking. Yet the long swings in residential construction revealed by Weber's estimates are clearly reflected in the general trend of the Inhabited House Duty statistics.

The only remaining source of information on building activity in Great Britain is the Census of Population. Here we find data on the number of inhabited and uninhabited houses on Census day as well as the number of houses then currently under construction. The Census was taken every ten years beginning in 1801. It is thus possible to calculate the net increases in the stock of houses for each decennial period from the data in the Returns. This has been done (see Table XVI, Appendix I) and the net intercensus increases were then converted into the index (1901-11=100) presented as Curve (E) in Figure 1. The usefulness of information on building activity extracted from the Census of Population is limited for a number of reasons. Changes in the definition of a house may give rise to discontinuities in the data that are undiscernible. It is also probable that the enumeration of uninhabited houses was not consistent from one census to the next. Of course the major problem concerns the absence of data for the intercensus years which
precludes the identification of major peaks and troughs in residential construction, let alone minor movements. In spite of these limitations, the statistics on house-building provided by the Census of Population gives a reasonable, if however, rough indication of the course of building activity over very long periods of time. The number of houses in the course of construction on Census day are also presented in Table XVI, Appendix I. They provide a further check on Weber's data in Census years and have been plotted in Figure 15 (Appendix I).

The available data to which we presently have access appear to confirm the time-shape of house-building manifested in Weber's index of residential construction. The study by Lewis shows that the incorporation of new data on towns that had previously not been studied and the use of alternative weighting techniques does not significantly alter the shape of the building index. We might conclude with Lewis that "the object of collecting more data must now be that of facilitating regional analysis rather than of improving the national series - which is still remarkably close to the one produced by Cairncross's crude computations and enviable intuition."  

study when we refer to a national building index, we will specifically have in mind the Weber index of residential construction.

THE TIME-PATH OF RESIDENTIAL CONSTRUCTION IN GREAT BRITAIN, 1860-1914.

The outstanding characteristic of Weber's index of building activity is the presence of major fluctuations or what have variously been referred to as "major cycles", "long swings" or "long waves" lasting for a period of about two decades. In fact, each of the indices presented in Figure 1 exhibits these phenomena to a greater or lesser extent with only slight variance, if at all, in timing. For the purpose of the present study, we will be primarily concerned with the course of house-building as manifested in Weber's index of residential construction. The trend in building activity was generally rising from 1860-61 to the peak of the first long cycle in 1876. There are two minor fluctuations in this period, the first and most important of which rises to a peak in 1863. New house-building declines for the next two years but from the trough in 1865-66 the index rises steadily to the peak of the second minor fluctuation in 1872. The ensuing decline lasts only a year and
is followed by a sharp rise in residential construction culminating in the major peak of 1876.

House-building falls off dramatically from 1877 to 1879. This steep decline is followed by sixteen years of depressed building activity. There are, however, minor fluctuations with the index exhibiting a slight upward trend after 1886. The industry begins to recover in the final decade of the nineteenth century. Weber's index turns up sharply in 1895, rising inexorably to the double peak in 1898 and 1903 of the second long cycle. The magnitude of the boom in residential construction that takes place at the turn of the century was unprecedented in British building history, and so also was the downswing that followed. Building activity declined persistently for over a decade. There were minor upturns in 1906 and 1913 but by the beginning of the First World War, building had sunk to a level lower than at any time since the early 1860's. The disruption of the domestic economy during the war years and the exigencies of the military effort against the Dreibund reinforced the downward trend in residential construction and by 1918 house-building had been reduced to almost zero.

The turning points of the major fluctuations in Weber's
The basic outline of the long swings in building activity is quite similar for all four indices. There are, however, some minor differences in timing and amplitude. Weber and Lewis both locate the peak of the first long cycle in 1876, but the intensity of the building boom described by Lewis index is much greater than that outlined by Weber. The behavior of the industry during the building depression of the 1880's and early 1890's traced out by these indices is also slightly different. While Weber's index depicts building activity as relatively constant over this period with only minor fluctuations and a low point reached in 1886, the index constructed by Lewis exhibits a gently declining trend to the major trough year 1890 with rather more exaggerated minor fluctuations about this trend. Both indices locate the double peak of the second long cycle in 1898 and 1903. From 1890 to 1898 the number of new houses erected rises consistently,
<table>
<thead>
<tr>
<th>Phase of Major Cycle</th>
<th>Weber</th>
<th>Lewis</th>
<th>Cairncross</th>
<th>IHD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn from decline to rise</td>
<td>1860-61</td>
<td>1860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. Rise</td>
<td>1861-1876</td>
<td>1861-1876</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn from rise to decline</td>
<td>1876</td>
<td>1876</td>
<td>1877</td>
<td>1876</td>
</tr>
<tr>
<td>Decline</td>
<td>1877-1886</td>
<td>1877-1890</td>
<td>1878-1885</td>
<td>1877-1893</td>
</tr>
<tr>
<td>Turn from decline to rise</td>
<td>1886</td>
<td>1890</td>
<td>1885</td>
<td>1893</td>
</tr>
<tr>
<td>II. Rise</td>
<td>1887-1898</td>
<td>1891-1898</td>
<td>1886-1899</td>
<td>1894-1899</td>
</tr>
<tr>
<td>Turn from rise to decline</td>
<td>1898-1903</td>
<td>1898-1903</td>
<td>1899</td>
<td>1899-1905</td>
</tr>
<tr>
<td>Decline</td>
<td>1904-1914</td>
<td>1904-1914</td>
<td>1900-1914</td>
<td>1906-</td>
</tr>
</tbody>
</table>

*Source: See Table XV, Appendix I.*
but because 1890 is a major trough in Lewis' index, the rise in building activity from that year to 1895 is somewhat more pronounced than that indicated by Weber's index. The rapid decline in new house-building after 1903 is captured in both indices, although the minor upturns in 1906 and 1913, apparent in Weber's index do not show up in Lewis' weighted index. These differences between the two indices that we have described are primarily attributable to the different weighting techniques employed in their construction, as well as the incorporation of new house-building data into the index of house-building activity calculated by Lewis.

The index constructed by Cairncross is in broad agreement with those of Weber and Lewis. He places the peak of the first long cycle a year later in 1877 and that of the second in 1899 with a minor peak in 1903. The gradual decline that began in 1878 is reversed in 1885 by a minor fluctuation that peaks in 1889. A three year slump is followed in 1893 by a steady rise to the peak in 1899 of the second long wave in residential construction (this also is a year later than that indicated by the indices of Weber and Lewis). The downward trend in house-building after 1903 described by Cairncross' index follows closely
that outlined by Lewis for the same period. It should also be noted that although the lowest level of building activity during the depression years occurs in 1885, the choice of this date as opposed to 1892 as the major trough is somewhat arbitrary. The index fails, however, to account for many of the minor fluctuations in building activity; the reason for this is found in the methods employed in constructing the index.¹⁷

Earlier we discussed the effects of periodic revaluations on the Inhabited House Duty statistics and the consequent impossibility of using a series constructed from this data (by taking first differences of the annual estimates, for example) as a measure of annual changes. The long swings in residential construction are clearly revealed in the House Duty statistics, yet the numerous limitations to which these statistics are subject make it impossible to accurately identify major turning points. Thus, the estimates found in Table I should only be considered very rough approximations to the actual turning points.

¹⁷See page 13 above.
There can be little doubt that the long swings in residential construction are real and fundamental. But in the following section we will see that they were essentially an urban phenomenon.

THE COURSE OF RURAL HOUSE-BUILDING IN GREAT BRITAIN, 1860-1914.

The present study is concerned primarily with residential construction in urban areas. However, it is important to have some understanding of the experience in the countryside. In this section we rely heavily on the researches of Weber and Lewis in an attempt to show that the long swings in residential construction described earlier were essentially an urban and not a national (in the sense of being both urban and rural) phenomenon.

Records similar to those available for urban areas from which annual estimates of house-building can be derived do not exist for the countryside. The only available evidence that gives some indication of the course of rural house-building is found in the Census of Population. Earlier we discussed estimated changes in the total housing stock derived from data in the Census Returns for England and Wales. This data was collected on the basis of Registration Districts.
By classifying these Districts as being primarily urban or rural, we may obtain estimates of the decennial changes in the rural housing stock. For this purpose Weber defined a rural district as one that in 1891 did not include a town with a population of 20,000 or more.

A few words of methodological caution are here in order. The taxonomy employed by Weber and later by Lewis do not give an accurate division of rural and urban areas. The resulting estimates of total housing stock in rural districts include houses located in small towns, while the opposite is true for urban districts. Another problem is associated with changes in the boundaries of Registration Districts. Small changes were made frequently but had a negligible effect on the long run trend in rural house-building.\textsuperscript{18} Large changes were relatively more important but far less frequent. Fortunately, the Census provides the necessary information so that adjustments could be made where necessary to ensure comparability. One final problem that we have encountered before, concerns the impossibility

\textsuperscript{18}Weber, "A New Index of Residential Construction", p. 121.
of identifying major turning points. This, however, as will soon become evident, is only of minor importance in a study of rural house-building.

The following table contains estimates of the housing stock in rural and urban Regional Districts obtained from the Census of Population as well as decennial changes.\textsuperscript{19} Columns (4), (5) and (6) of Table II are graphed in Figure 2. House-building in Rural Districts climbed gradually to a high point on or near 1871. This is followed by a gentle decline for approximately two decades. In the 1890's and 1900's the trend in rural house-building rises significantly, yet the most salient characteristic of the data on rural variations over the entire half century is the marked absence of long swings similar to those experienced by the urban districts. Thus the highly correlated movement of urban and national changes in housing stock apparent in Figure 2 are explained by:

a) the absence of any significant trend in the rural sector, primarily before 1890, and

\textsuperscript{19} Data from the Census of Population in Scotland have been excluded because an official change in the definition of a house in 1881 render the subsequent estimates incomparable with those of earlier census'.
TABLE II

CHANGES IN URBAN AND RURAL HOUSING STOCK
IN ENGLAND AND WALES 1851-1911

(000's)

<table>
<thead>
<tr>
<th>Year</th>
<th>(1) Total Housing Stock</th>
<th>(2) Housing Stock In Urban Reg. Dist.</th>
<th>(3) Housing Stock In Rural Reg. Dist.</th>
<th>(4) Increase in Col. (1)</th>
<th>(5) Increase in Col. (2)</th>
<th>(6) Increase in Col. (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1851</td>
<td>3432</td>
<td>1784</td>
<td>1648</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>3924</td>
<td>2175</td>
<td>1749</td>
<td>492</td>
<td>394</td>
<td>98</td>
</tr>
<tr>
<td>1871</td>
<td>4520</td>
<td>2658</td>
<td>1862</td>
<td>596</td>
<td>483</td>
<td>113</td>
</tr>
<tr>
<td>1881</td>
<td>5218</td>
<td>3264</td>
<td>1954</td>
<td>698</td>
<td>605</td>
<td>93</td>
</tr>
<tr>
<td>1891</td>
<td>5824</td>
<td>3788</td>
<td>2036</td>
<td>606</td>
<td>521</td>
<td>85</td>
</tr>
<tr>
<td>1901</td>
<td>6710</td>
<td>4517</td>
<td>2193</td>
<td>886</td>
<td>729</td>
<td>157</td>
</tr>
<tr>
<td>1911</td>
<td>7550</td>
<td>5116</td>
<td>2434</td>
<td>840</td>
<td>599</td>
<td>241</td>
</tr>
</tbody>
</table>


*The figures diverge slightly from the increase in cols. (2) and (3) respectively. Cols. (2) and (3) relate to entries in the actual Census years whereas cols. (5) and (6) were obtained by taking increases in comparable areas between one Census and another.* Lewis, "Indices of House-Building", p. 332.
Figure 2

NET INCREASE IN URBAN, RURAL AND TOTAL HOUSING STOCK IN CENSUS DECADES
ENGLAND AND WALES 1861-1911

(A) Net increase in total housing stock
(B) Net increase in housing stock of urban registration districts
(C) Net increase in housing stock of rural registration districts
b) the extent to which urban house-
building constituted a greater
proportion of the national total.

The divergence of the two curves after 1890 necessitates
the adjustment mentioned earlier required to render Weber's
Index of residential construction representative of the
nation as a whole.
CHAPTER III

THE CAUSES OF LONG SWINGS IN HOUSE - BUILDING

In his path breaking study Secular Movements in Production and Prices, published in 1930, Simon Kuznets presented extensive evidence of the existence of secular fluctuations of 16 to 22 years duration in numerous statistical measures relating to the volume of economic activity. These long swings appear to be a prominent characteristic of building activity in general and residential construction in particular. Sir William Beveridge was the first authority to suggest the existence of long swings in building in the United Kingdom, basing his argument on a detailed analysis of unemployment statistics. There soon followed the studies of Riggleman (1933), Burns (1934) and Newman (1935), all on the building industry.

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3 Riggleman, "Building Cycles in the United States, 1875-1932".
in the United States, and all confirming the long swing.

In this chapter we will look briefly at the structure of the housing sector, and the forces which combine to determine the course of residential construction. The basic relationships are presented below in a stock-flow model of the housing and mortgage markets. In the second section we consider the lag structure of these relationships, and the general institutional arrangements which are the major sources of instability in the adjustment process by which changes in demand are translated into changes in the supply of housing accommodation. Finally, we will look briefly at the various explanations of the course of house-building in Great Britain from 1860 to 1914.

THE STRUCTURE OF THE HOUSING MARKET

The rate of construction of residential housing may be determined by a large number of factors interacting in a conceivably wide range of complex patterns. In a comprehensive paper on the determinants of residential construction, Leo Grebler and Sherman J. Maisel list the following factors as those commanding the greatest attention (with varying degrees of emphasis) of most students of the
building cycle.\footnote{\textcite{Grebler1963}}

1. Changes in population
   a) Increases in population
   b) Changes in the age-sex composition
   c) Change in the number, type and size of households
   d) Internal migration and immigration.

2. Changes in income and employment
   a) Total disposable personal income
   b) Income distribution
   c) Employment and unemployment

3. Consumer asset holdings and their distribution, especially liquid asset holdings and their equities in existing houses.

4. Changes in the prices of housing
   a) The price elasticity of housing relative to other prices.
   b) The shape of the construction supply and cost curves.

5. Relationship between occupancy costs and prices of dwellings
   a) Credit availability and the cost of credit
   b) Depreciation
   c) Imputed costs of equity funds

6. Consumer tastes and preferences

\footnote{\textcite{Grebler1963}}
7. Net replacement demand for dwelling units demolished or otherwise removed from the inventory less net conversions and mergers of existing units.

8. Conditions in the existing housing supply
   a) Utilization of the housing inventory
      1. Vacancies
      2. Intensity of occupancy
   b) Prices and rents for existing dwelling units
   c) Quality, location

9. Reactions to changes in demand
   a) Builders' organization and profit expectations
   b) Investors organization and profit expectations
   c) Market structure and market information

This list and the fact that it is not comprehensive gives some indication as to the complexity of any analysis which seeks to adequately explain behavior in this sector of the economy.

Many of the studies that have been undertaken to date have proceeded by concentrating on only a few of the potentially large number of factors that can exert a decisive influence on the volume of building activity. The emphasis has generally been on estimating the structural relationships between the number of housing starts (or the volume of expenditure on residential construction) and a few selected explanatory factors. For example, studies by
Alberts\textsuperscript{7} and Guttentag\textsuperscript{8} have attempted to define the relationship between the residential construction cycle and changes in credit conditions. Models relating housing starts to the level of house rents, income and demographic factors have been constructed by Tinbergen,\textsuperscript{9} Chawner,\textsuperscript{10} and Derksen\textsuperscript{11}. A number of studies have tried to relate the volume of new housing starts to the operation of the housing market as a whole\textsuperscript{12} and at least one study has attempted to disaggregate the market into its single and multiple dwelling unit sectors and explain the influence of monetary factors on the behavior of these sectors.\textsuperscript{13} The specific nature of these and other studies is to a large extent


extent governed by the available data and the exigencies of statistical convenience and economy.

A critical survey of this literature is outside the scope of the present paper.\textsuperscript{14} It may be useful, however, to quote at some length the conclusion drawn by Grebler and Maisel in a review of present knowledge of the housing sector:

"The statistical-econometric approach lends itself to more complete, inclusive, and quantitative statements with more definite time dimensions and estimates of leads and lags. But both internal analysis of the econometric models and comprehensive tests of their results - the first tests undertaken in this field - revealed the potential advantages to be largely illusionary ... None of the existing studies was in a finished enough state to use it for a full analysis of the market or for predicting the impact of any particular variable. They lacked completeness, accurate measurement of parameters, and frequently even the necessary assumed form of the relationship between a variable and construction starts or expenditures. If the ability to predict is used as a criterion of "success" of econometric models, the results are far from flattering to this method. Most of the econometric models did worse in this respect than the "naive" forecast or judgement projections which our tests employed for comparison"\textsuperscript{15}

\textsuperscript{14} For a critical survey of analyses see C.E.V. Leser, "Building Activity and Housing Demand", \textit{Yorkshire Bulletin of Economics and Social Review}, Vol.3 (February, 1951), pp. 131-149 and Grebler and Maisel, "Determinants of Residential Construction", passim.

\textsuperscript{15} Grebler and Maisel, "Determinants of Residential Construction", p. 603.
In light of these criticisms and in view of the data problems (which assume gargantuan proportions) associated with the available statistics for the period under consideration, we will, in what follows, briefly outline the structure of the housing market in general qualitative terms. This will provide an appropriate prelude to the subsequent discussion of instability in the housing sector.

The housing market is not a well defined "market" in the traditional sense.

"A housing market area is the physical area within which all dwelling units are linked together in a chain or substitution ... In a broad sense, every dwelling unit within a local housing market may be considered a substitute for every other unit. Hence, all dwelling units may be said to form a single market, characterized by interactions of occupancy, prices and rents. However, this view can be maintained only for the most general analysis and even then with great difficulty". 16

The chain of housing substitutes is circumscribed by travel time (primarily to and from work). Thus, housing markets are of necessity, local markets. This is an important

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observation, the implications of which are not always fully appreciated.

In reality the housing market is a series of overlapping submarkets, each comprising a cohesive collection of substitutes and distinguished by a specified characteristic mix in terms of tenure, neighborhood, type of structure, number of rooms, location, quality, interior design and so on. The choice of definition is somewhat arbitrary and different types of submarkets could be separated by changing the specification of the characteristic mix.

The various submarkets are "influenced by different institutional considerations and the behavior of participants in these submarkets often differs considerably, making it desirable to disaggregate the housing market as much as possible."\(^{17}\) Thus, a two-fold classification by tenure and type of structure might define the following submarkets: the single family fee market, the multiple dwelling fee market, the single family rental market and the multiple dwelling rental market. Such a distinction is desirable because it is argued that houses built for sale

to owner occupiers should be analyzed in much the same way as consumer durables, while dwelling units built for rental purposes are more closely related to the market for income properties.\textsuperscript{18}

The general structure of the housing market is outlined in the stock-flow model of the housing and mortgage markets presented in Figure 3.\textsuperscript{19} The model is of necessity, simplified, and is used here to demonstrate basic relationships. At a given point in time the stock of housing is made up of a number of units of each of a wide range of types of dwellings. It will be helpful then to think of this stock in terms of a joint distribution of numbers of houses by size of unit, age, tenure, location, number of units per building, condition and other various quality dimensions.

The demand for each type of dwelling in this heterogeneous stock will depend on a similar distribution of household characteristics in terms of income, family composition, asset holdings, etc., as well as the prices of this and


\textsuperscript{19}This model is based on similar models constructed by Smith, "A Model of the Canadian Housing and Mortgage Markets.", p. 4; and Maisel, "Fluctuations in Residential Construction Starts", p. 362.
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS</td>
<td>Housing Starts</td>
</tr>
<tr>
<td>RC</td>
<td>Expenditures on Residential Construction</td>
</tr>
<tr>
<td>CC</td>
<td>Construction Costs</td>
</tr>
<tr>
<td>N</td>
<td>Average Earnings of Labour in Construction Industry</td>
</tr>
<tr>
<td>M</td>
<td>Building Material Costs</td>
</tr>
<tr>
<td>F</td>
<td>Cost of Temporary Financing</td>
</tr>
<tr>
<td>L</td>
<td>Cost of Land</td>
</tr>
<tr>
<td>V_s</td>
<td>Vacancy Rates: Existing Dwellings</td>
</tr>
<tr>
<td>V_Hs</td>
<td>Vacancy Rates: New Dwellings</td>
</tr>
<tr>
<td>P_H</td>
<td>Price of Houses</td>
</tr>
<tr>
<td>R</td>
<td>Rents</td>
</tr>
<tr>
<td>Y_P</td>
<td>Permanent Disposable Income</td>
</tr>
<tr>
<td>P_G,S</td>
<td>Prices of Alternative Goods and Services</td>
</tr>
<tr>
<td>MT</td>
<td>Lending Terms</td>
</tr>
<tr>
<td>MR</td>
<td>Mortgage Rates</td>
</tr>
<tr>
<td>BSC</td>
<td>Mortgage Credit Generated by Building Societies</td>
</tr>
<tr>
<td>MC</td>
<td>Flow of Mortgage Credit (non-BSC)</td>
</tr>
<tr>
<td>SMC</td>
<td>Stock of Institutional Mortgage Holdings</td>
</tr>
<tr>
<td>RA</td>
<td>Yield and Terms on Alternative Investment</td>
</tr>
<tr>
<td>P</td>
<td>Size and Disposition of Institutional Investment Portfolios</td>
</tr>
<tr>
<td>HHF</td>
<td>Household Formation</td>
</tr>
</tbody>
</table>
each alternative form of housing accommodation, the prices of other goods and services and finally the cost and availability of credit. 20

These various elements are represented on the left hand side of Figure 3. Together, the housing supply and demand matrices (distributions) determine a matrix of vacancy ratios and a matrix of prices and rents the individual elements of which prevail in the various submarkets. It is important to point out that the different segments of the housing market characterized by different kinds of housing are somewhat insulated from one another because families with different characteristic mixes are in the different submarkets. "In the absence of a channel between [sub]markets, that is, a group of families who seriously consider more than one submarket as a place of residence, upward or downward price movements can persist independently in different parts of the market for considerable periods." 21 To fully appreciate the market process and changes in value and occupancy rates under various circumstances, one must have some understanding not only of the


types of submarkets, classified according to dwelling characteristics, but also of the types of families that move into and out of these submarkets. It is also important to identify the causes of household movement, because if for example "non-price" motivated movement is large relative to demographic shifts in response to differences in price and quality among various markets and submarkets, then there may be no long run tendency toward market equilibrium.  

On the right hand side of Figure 3, the rate of housing construction (HS) depends on the price of land (L) and the costs of construction (CC). Construction costs, in turn, depend upon the average earnings of labour in the construction industry (N), material costs (M), the cost of bridge or interim financing during 

\[ HS = f(L, CC) \]

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Our discussion in this section avoids many dynamic considerations which will be discussed in further detail in the following section. However, it is important to recognize that the rate of residential construction is determined by the interactions of three dynamic processes:

a) The adjustment of prices and rents to the demand and supply of houses.

b) The adjustment of the rate of construction to rents, dwelling prices and construction costs.

c) Changes in supply resulting from new construction and demolition.
actual construction (F) and the current level of residential (RC) and nonresidential (NRC) construction activity relative to their respective production capacities. Builders expectations (EB) with respect to current and future market conditions may exert an entirely independent influence on the rate of construction.

At the bottom of Figure 3 the flow of mortgage credit (MC) generated by financial institutions other than building societies, has a direct influence on lending terms (MT) and mortgage rates (MR). The demand for mortgage credit depends on much the same factors affecting the demand for housing accommodation. The supply of mortgage credit (MC) however, depends on the stock of institutional mortgages holdings (SMC), the size and disposition of institutional investment portfolios (P) and the yield and terms on alternative investments (RA). The supply of mortgage credit made available through the formation of building societies (BSC) acts as an independent constraint (influence), along with the mortgage credit supplied by financial institutions, on the volume of housing starts.

This stock flow model of the housing and mortgage markets outlines only basic relationships and is thus an
oversimplification of the real complexities which characterize this sector of the economy. It is useful, however, in illuminating a number of problems with which any analysis of the housing market must come to grips, but which are all the often ignored. By now it should be apparent that the complicated inter-relationships which constitute the market are "not easily reduced to quantitative terms, much less combined into a single link of coefficient. The matrix [or submarkets] itself is in a constant process of change, as the exogenous variables whose impact on the market we seek to trace have the added effect of permanently altering the market structure itself."\textsuperscript{23}

The structure of the housing market also has important implications for the level of aggregation appropriate to housing market analysis. The pattern of relative prices and rents within and between various markets may have an important influence on the pattern of residential construction. This may be lost in the construction of an aggregate rent index. Consequently any natural tendency to explain

\textsuperscript{23}Grigsby, \textit{Housing Markets and Public Policy}, p. 43
the course of house building in terms of the rent aggregate may lead to "utterly erroneous conclusions." This problem will be discussed at greater length in Chapter IV.

Finally, any analysis which seeks to explain the behavior of residential construction must consider the large number of exogenous economic and demographic forces which have an impact on this sector of the economy. This is, in part, required by the absolute magnitude and importance of the housing sector and by its interdependence with other areas of the economy.

MAJOR SOURCES OF INSTABILITY IN THE HOUSING SECTOR OF THE ECONOMY

The structure of the housing-sector of the economy and the nature of the durable good supplied and demanded in this sector are such that long swings in building activity tend to arise quite naturally. In this section we will discuss some of the more important sources of instability which are instrumental in generating these cyclical

phenomena.  

There are a great many factors that contribute to instability in the housing sector and thus give rise to major fluctuations in construction activity. Though in most cases it is not possible for us to measure the differences in the influences these forces exert, it is possible to identify some of the more important ones. Changes in family income are of central importance, but the specific impact pattern in terms of direct and indirect influences may be highly complex. Household formation in general and family formation through marriages in particular are affected by income levels and expected future incomes, since rising incomes enable young people to establish their own households. As the financial capacity of families improves there is a tendency for those who have been sharing housing accommodation because of unemployment or low earnings, to undouble and establish separate households.


26 Leser, "Building Activity and Housing Demand", p. 143
Perhaps the most important effect of a secular rise in incomes is the desire of all income groups to improve their housing condition. Expenditures of all types, including housing, increase with income and this helps to accelerate the filtering process, that is the downward movement of dwellings between family income levels. The demand for better accommodations adds to the demand for new dwellings in those submarkets where new construction is normally introduced.

Another major factor contributing to cyclical fluctuations in house-building is the geographical shifting of population. Thus, an upswing in economic activity in a particular region accompanied by an increase in employment opportunities and rising family incomes is not only favorable in and of itself in stimulating construction, but also by attracting new families who wish to take part in the local prosperity. Thus population shifts within a country which accelerate the rate of household formation in particular regions will stimulate housing demand and encourage an upswing in building activity even though the total population of the country remains unchanged.

The central importance of demographic factors in the demand for housing accommodations has been emphasized with minor reservations by A.J. Cairncross:
"Now it is no doubt true that the most powerful influence on the side of demand has generally been population growth; and that, in the long run, if the size of the population shows a steady trend upwards or downwards the level of building activity will be affected in the corresponding direction." 27

Population growth, and the fluctuations to which it is subject are not the only important influence on the side of demand. Changes in the level of rents relative to other elements in the cost of living as well as the relationship between rents and the level of income have an important influence on the demand for house space.

Changes in the standard of housing are also singled out by Cairncross as a major source of instability in the housing sector.

"New houses may offer amenities not available in existing houses or be located in places more convenient to existing householders. Since only a small number of new houses are erected annually in relation to the existing stock, the result of any rapid change in amenities (for example, the introduction of bathrooms after 1880) or in facilities (for example, the development of suburban transport through tramways and electric railways) may be a marked acceleration in new residential construction." 28

The potential destabilizing influence of changes in the rate of demolition are also noted with reference to the clearing for provision of railway facilities in the major towns during the latter part of the Nineteenth century. Cairncross concludes that in the long run "we should expect fluctuations in residential building to reflect changes in the demand for house-room (subject to any simultaneous changes affecting existing dwelling-houses either by way of demolition, improvement, or conversion to other purposes). We might also find that in the circumstances examined, the dominant influence on demand was population growth...." 29

The durable nature of dwellings is of central importance to the time pattern of adjustment in the housing sector. Unlike many other products, the output of the construction industry cannot be identified with total supply, but is equal to the increase in supply, after accounting for demolitions and conversions. The vector of house prices and rents will be determined by the balance of aggregate demand in relation to the existing stock, rather than the current supply which represents only a small portion of the total stock.

29 Ibid.
Tradition and long term contractual arrangements, among other factors, combine to give house prices and rents a certain inertia. Changes in demand and supply conditions in the housing market bring about changes in prices and rents only after a considerable lag. In the short run the adjustment of supply to demand takes place via changes in the intensity of utilization of the current inelastic stock of houses. Excess demand leads to doubling up and part letting of existing accommodations, while excess supply results in unoccupied houses. Several years may be required to eliminate an excess supply or demand at existing prices by way of adjustments in current production.

The building industry, itself, is a major source of instability. It has been objected that house-building as a loosely integrated process hardly justifies the term "industry". The residential construction industry is indeed peculiar in a number of important respects. For example, the production or fabrication process takes place at the site where the building is to be used. Consequently all the various materials, operations and factors must be brought to the product, rather than the product passing

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through a series of production stages within a factory. Dwellings are not well suited to mass production.

The widespread geographical dispersion of the production process is a major obstacle to rationalizing the adjustment of the supply of new housing to changes in demand. "The predominant type of building organization is small, often a one man outfit, with little capital, limited technical skill, and no inclination, time or money to conduct research in methods and materials." 31 The prevalence of a large number of small firms unable to take advantage of the economies of large scale production tends to lower the volume of production, thus lengthening the lags in the individual response sequence.

The lack of a well defined industrial structure is in part the reason why there is a marked tendency for many firms to disappear during a building slump and to proli ferate during booms. This propensity toward dissolution and revival is important in explaining the lagged market adjustment mechanism on the side of supply. A resurgence of demand may persist for several years before there is any significant

31 Ibid., p. 176.
increase in construction activity among builders. Houses are among the most durable of goods. "Existing structures can be made to serve with a little crowding, a little patching here and renovation there, for a considerable period of time before the need for new houses becomes sufficiently acute to push rental values higher and definitely stimulate the slow-moving cumbersome, scattered operators," many of whom left the industry during the previous depression. The response of supply is delayed further by the long gestation period in residential construction. In the Nineteenth century it generally took between six months and a year to complete an average size house in Great Britain.

The atomistic character of the building industry renders it especially prone to erroneous estimates of excess demand and supply. It is not surprising, therefore, that there has developed a tradition of speculative overbuilding which tends to exaggerate and prolongue the cyclical fluctuations typical of house-building activity. The existence of


speculative promotion and reaction in the house-building sector reflects a fundamental structural problem in part caused by the absence of adequate market information. This is perhaps not technically an "imperfection" in the market, but it is a major factor contributing to general instability.  

The potential for over-expansion is aggravated by the financial requirements of the building industry. In contrast to relatively small fixed capital requirements building firms confront the banking system and building societies with rather large demands for bridge financing (i.e., working capital requirements during the period of construction). "It therefore becomes a potent instrument for exploiting the inflationary/deflationary potential of a free banking system which can vary either the cash reserve ratio or its Advances/Investments ratio in response to changes in the demand for bank advances."  

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In a general study of building cycles and investment, Duesenberry has focused on price changes and hinted at the role played by vacancies in an intuitively appealing description of the dynamic response mechanism in residential construction.

"Whenever excess demand appears, prices will eventually rise high enough to induce a rate of building sufficiently high to eliminate the excess demand. That requires a rate of building in excess of the rate of growth of demand. At the moment when excess demand is eliminated and prices stop rising, the rate of building is higher than the rate of growth of demand, and building will not slow down until enough excess supply has developed to lower prices or reduce the rate of sale of houses. That implies that the rate of construction must again fall to a level below the rate of growth of demand until excess demand has again developed, so that the cycle repeats." 36

It may now be helpful to summarize our discussion of sources of instability by tracing out the response pattern of what might be referred to as a pure building cycle. Assume an initial increase in the number of families desiring accommodation or a rise in incomes or both. The growth of demand results in a reduction of existing vacancies as new families

36 Duesenberry, Business Cycles and Economic Growth, p. 158.
buy houses or, in response to increased purchasing power, families undouble or seek to improve their housing standard. Eventually rents and prices rise but because of inertia (stickiness) and the lagged response of the building industry an inventory of excess demand is created. The eventual response of supply may be encouraged by increasingly easy credit and the expectation of higher profit from investment in real estate. As the building boom gets underway increased expenditures generate further increases in income and housing demand through the familiar multiplier process. Eventually, over-confidence and unfounded expectations lead to speculative overbuilding. The appearance of an increase in vacancies and reduced house sales may not have a retarding influence on the rate of construction until the build-up of excess supply exerts a downward pressure on prices and rents. Banks become conservative and credit contracts. The response of the construction industry induces a decline through the multiplier process. A coincident business depression may accelerate the downward trend, leading to outmigration, deferred marriages, and doubling up. Depending on the degree of pessimism and the extent of overexpansion it may take years for the building industry to recover, but eventually the excess supply
becomes an excess demand and the process repeats.  

Thus, a case has been made for the existence of a tendency toward systematic cyclical movement in housebuilding activity. However, owing to the very large number of forces to which this sector of the economy is subject we might expect the actual pattern of residential construction to differ significantly from that implied by the simple model developed here.

WHY THE LONG SWINGS IN BRITISH HOUSE-BUILDING FROM 1860 TO 1914?

The long swings in building activity in Great Britain outlined in the previous chapter have attracted much attention in the past few decades for a variety of reasons.

Building, as a large and widely diffused industry, has a marked impact on the general level of employment and trade throughout the economy of any country. The violent nature of fluctuations in residential construction raises important questions concerning the maintenance of stability in the general

37 For further elaboration of the dynamic forces which interact to create building cycles see Lionel Needleman, The Economics of Housing, (London: Staples Press, 1965), pp. 147-15.
level of economic activity. And while building is one of the most important factors in the trade cycle, one finds a dramatic difference of period and amplitude between the cycles in building and those in trade in Great Britain.

Vigorous debate has centered on the causal mechanisms by which these long swings in British construction activity might be explained. There are those who contend that external considerations were of primary importance in determining the pattern of domestic investment in housing. It is argued that the "regional" economies of Great Britain and America interacted through a pattern of inverse cycles in investment, migration and trade for about 20 years. Conversely, others have concluded that the course of residential construction was largely determined by factors specific to the domestic housing market. They agree that external influences may have played some part at the margin, but find that investment in the domestic housing stock was not a residual activity which accelerated only when investment opportunities abroad seemed unattractive.

In an article on the Glasgow building industry, published in 1935, Professor A.K. Cairncross suggested a likely relationship between house-building in Great Britain and the waves
of emigration and investment overseas:

"This emigration was chiefly to the countries to which British capital was flowing: it was active when foreign investment was active, depressed when foreign investment was depressed ... During these pauses there was simultaneously pressure on house-accommodation and a surfeit of cheap money; when the game began again, the need for houses and the funds for their construction vanished together. Moreover the very cessation of foreign investment, by bringing to this country distress sales of raw materials and foodstuffs, drove more and more of the agricultural workers to the towns and increased the purchasing power of the industrial population; the building industry prospered at the expense of colonial development."  

Cairncross did not then suggest any causal mechanism; elaboration of this idea was to follow 18 years later with the publication of his *Home and Foreign Investment*.

A study of building in Britain and the United States led E.W. Cooney to outline a limited explanation of the forces underlying the reciprocal relationship in the course of residential construction between the two countries. Recognizing that building is basically a localized industry with a local

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equilibrium, no direct connection can be made with another country's economy. But a comparison of Douglas's estimates of British capital exports with the two building indices suggests that "it was capital exports from the U.K. which linked building in London and the U.S.A. in the way already described." Cooney supports this hypothesis by drawing on the observations of Cairncross and Rostow that during periods when returns on foreign investments were relatively low, there was a natural tendency for the British investor to turn to property as a safe outlet for his investment funds. Thus, a reduction in capital exports and emigration tended to raise both the demand for new construction and the expectation of higher profits by satisfying the demand. "London building was rather the poor and somewhat dull relation in the nineteenth century family of investment opportunities. It was, however, like many dull things, felt to be safe, and when the brilliant promise of foreign investment was periodically falsified by events, the British investor turned to property".

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43 Cooney, "Building in Britain and the U.S.A.", p. 352-53
The first comprehensive study of investment in British residential construction from 1870 to 1913 was undertaken by Cairncross within the framework of a broad analysis of fluctuations in home and foreign investment generally. His study focuses attention on the fundamental importance of the role of investment, migration, and the terms of trade in the explanation of industrial fluctuations in Victorian Britain. The level of income and employment ultimately depended upon the level and disposition of home and foreign investment, both of which, in turn, were largely determined by the terms of trade.

Changes in foreign investment and the associated movements of population reacted on the building industry through both the availability of capital for investment purposes and shifts in the demand for housing accommodation:

"The more foreign countries borrowed, the more men we sent them to carry out the work of new construction for which British capital was wanted. The emigration of these men left houses empty in this country. There was thus less certainty of finding tenants for newly built houses, and more difficulty in letting houses at customary rents. The decline in demand naturally hit the building industry. Simultaneously, builders had often

44 A.K. Cairncross, Home and Foreign Investment.

45 Cairncross does have a bit of trouble explaining the reason why, during the 1880's when capital exports were very high, there was a deterioration in the terms of trade.
to put up with worse terms of credit; or investors ceased to buy house property altogether and purchased foreign bonds instead."46

As the wave of foreign investment subsided, capital was once again channeled into the domestic mortgage market and hence made available to building societies. The decline in emigration improved the demand for housing accommodation. As the real return to investment abroad (in the form of increased supplies of cheap raw materials and food products) exerted downward pressure on prices in Europe, real wages rose in the towns. This not only made it possible for city dwellers to improve their living conditions by moving to more desirable accommodation, but also increased housing demand by attracting labour to the towns from depressed agricultural regions.

Cairncross argues, with respect to house-building in Glasgow (which followed a pattern very similar to that in Great Britain as a whole), that "the building cycle was little more than a migration cycle in disguise."47 The upswing in emigration that got underway in the mid-seventies brought the first long swing in house building to a close. "The reversal of this flow in the nineties gave the second most of

46 Ibid, pp. 219-20.
47 Ibid, p. 25
its impetus. When the outflow started again, on such a scale as to arrest the population almost completely, the second boom, too, petered out.48

Migration, both internal and external, was an important factor determining the course of house-building in Great Britain. Cairncross shows that the tremendous growth in population in the 1890's was accompanied by a significant increase in the movement of population from one location to another within the country. "The building booms of Victorian Britain seem to have depended not only on an increase in the aggregate demand for house room, but also upon changes in the incidence of this demand."49 This, among other things, helps to explain the prolongation of the building boom in the 1890's and 1900's.

Building on the work of Cairncross, Brinley Thomas50 has analyzed the long waves of migration and investment within the context of an "Atlantic economy". There is, however, a marked difference in emphasis between the two studies. Cairncross sees the terms of trade as being the major determining factor

48 Ibid.
49 Ibid., p. 219
in the distribution of investment between home and foreign alternatives; Thomas views movements in the terms of trade as consequences of underlying changes rather than as a causal force.

Drawing on a wide range of statistical evidence, Thomas outlines the behavioral relationships which linked the various sectors of the "Atlantic economy". A home construction sector and an export sector within each region (i.e. the United States and Great Britain) compete for resources while the regions themselves compete for the resources of the economy they make up. Important inter-regional differences existed between the relative size and cyclical behavior of the home construction and export sectors. There were also major differences in resource endowments: Great Britain being relatively capital abundant, the United States being relatively well endowed with natural resources.

The key to the explanation of long swings in residential construction is found in the role of international migration. "A major influx of population accompanied by capital imports, induces a boom in construction in the United States; meanwhile the upturn of emigration and foreign investment in Great Britain is accompanied after a short lag by a fall in the volume of building".  

\[51\] *Ibid*, p. 177
Thomas then argues that the United States has a strong propensity to spend its borrowed funds on British capital goods, thus resulting in a boom in the British export sector at the expense of home construction. But the wave of out-migration gives rise to changes in other factors which are adverse to house-building. The reduction of internal mobility that accompanies increased emigration, the tendencies for the number of vacancies to rise and for rents to decline, all have a depressing effect on the level of domestic building activity. During this phase of the long swing the depression in home construction more than offsets the boom in export production, thus leading to a general decline in real income per capita (relative to trend).

In the United States the inflationary expansion of home construction draws labour and resources from the export sector. This results in relative price changes: domestic goods prices rise most, followed by export prices; import prices rise least. The minor change in import prices results from the ability of the British export sector to draw factors from the depressed home construction industries with little or no increase in costs. "Booming exports accompanied by depressed constructional activity yield a more moderate expansion than booming constructional activity accompanied
by depressed exports."  Consequently, the net barter terms of trade turn against Great Britain.

A downturn in the United States is accompanied by a fall in capital imports and immigration. In Great Britain the reduction of foreign investment and capital exports frees labour and loanable funds for employment in the expanding domestic construction sector. The decline in emigration and the increase in internal mobility lead to a swelling of the urban population, a reduction in vacancies and rising house prices and rents -- all favorable to increased building activity. "The expansive force of this induced investment is more potent than the depressing effect of the foreign trade multiplier; hence a rise in real income a head relative to trend."  

The expansion of productive capacity that took place in the United States during the upswing in house construction resulted in a substantial increase in the supply of raw materials and food products exported overseas at "falling or slowly rising prices". Thus, the net barter terms of trade shift in favor of Great Britain.

53 Thomas, Migration and Economic Growth, p. 178.
This, then, is the pattern of the Atlantic economy, "dividing a common fund of incremental energies between its regions in varying proportions from time to time ... whether a villa should go up in Huddersfield decided, or depended on, whether a frame house went up in Iowa." 54

P.J. O'Leary and W. Arthur Lewis 55 seriously question the existence of any systematic inter-relationships between the development of the United States and Great Britain. The ebb and flow of capital across the Atlantic, freed periodically by a surfeit of British home investment, is dismissed as a possible link with the argument that, "for while it is true that the U.S.A. was importing capital, its capital imports were so small in relation to its own savings - averaging between 1874 and 1895 less than a half of one percent of gross national product - that it is impossible to hold that capital formation in the U.S. was at this time dependent on U.K. lending ..." 56 This also leads to the conclusion that "the U.S. governed its own fortunes in the nineteenth century,


56 Ibid, p. 556.
and if any adjustment had to be made it was made on the other side of the Atlantic.”

The theory that migration was an important link conditioning the inverse pattern of house-building in Great Britain and the United States is treated with suspicion, for "emigration rates made less than a quarter of one percent difference to the annual rate of growth of population.”

If there was any systematic interaction between the two economies after 1870, Lewis and O'Leary would be predisposed to a mechanism in which the British building cycle was timed to fit in with that in the U.S. Mediation would then take the form of British investors shifting funds between foreign and domestic portfolios in response to changes in relative returns. They are skeptical, however, concluding that, "we cannot even rule out the possibility that the alternation of the U.S. and U.K. building cycles was a sheer accident, springing perhaps from the different effects which the Napoleonic Wars may have had upon the progress of residential building in the two countries. The case for thinking it may have been an accident lies in the fact that if the two cycles had coincided, there would have been no mechanism to

57 Ibid.
58 Ibid.
make them alternate."\(^{59}\)

This last position has been discounted by a number of authorities, notably Brinley Thomas and A.R. Hall. Thomas counters:

"Obviously if you express migration and capital flows as a proportion of population growth and gross national product respectively, you will nearly always get ridiculously small percentages; but these percentages are irrelevant. It is surely the margin that counts." \(^{60}\)

He also stresses that the role of capital transfers should not be considered independently of the redistribution of population. British foreign lending was an important factor in enabling immigrants to be absorbed in the developing areas of the world. Their combined impact at the margin had a profound influence on the pattern of home investment. Thus:

"A slump in emigration meant (a) an increase in population concentrated in the house-seeking age group, and (b) a substantial increase in internal migration to the industrial areas stimulated by the rise in home investment; both these factors had a direct bearing on the demand for housing. Moreover, a decline in emigration was accompanied by a rise in the volume of loanable funds available at home." \(^{61}\)


\(^{60}\) Thomas, *Economics of International Migration*, p. 10.

\(^{61}\) *Ibid*, p. 11.
Lewis and O'Leary claim, without substantiation, that contracyclical long swings in house-building activity in the United States and Great Britain can be traced from the 1820's.\(^6^2\)

Thomas dates the inverse pattern from 1847, citing as evidence Shannon's index of brick production to 1849, railway miles added from 1843 to 1868, and Cairncross's building index from 1870 to 1914.\(^6^3\) In a stimulating article on the causes of industrial fluctuations, D.J. Coppock\(^6^4\) criticizes both of these positions, arguing that there is no evidence of there having been long building cycles in the United Kingdom before 1870.

The volume of British exports followed closely the U.S. transport-building cycle from 1840 to 1870. This is reflected in the minor secular swings in the deviations from the trend of the Hoffman index of industrial production. These fluctuations were moderated by the tendency for house-building in Great Britain to alternate with railroad construction in the decades 1830-60. In the U.S. they swung together. "Since investment in the two industries must have dominated British home investment around this time we can say that if aggregate

\(^{6^2}\) O'Leary and Lewis, "Secular Swings in Production and Trade", p. 126

\(^{6^3}\) Thomas, Migration and Economic Growth, pp. 175-6, 325.

home investment did not swing in phase with U.S. investment it certainly did not swing inversely.\textsuperscript{65} The volume of emigration from the United Kingdom fluctuated in phase with the U.S. transport-building cycle during these years, but was not large enough to cause an inverse domestic building cycle.

The origin of the inverse long swings in residential construction, according to Coppock, is found in the industrial developments which took place in the 15 years following the American Civil War. Both the United States and Great Britain experienced an upswing in building activity in the late 1860's. This was accompanied by a boom in British exports and external migration. Feverish overexpansion led to a downturn in 1871-72, after which railway construction and house-building in the U.S. fell off rapidly. British exports peaked in the same years and then declined (relative to trend). The outward movement of population was arrested in 1873. This, it is argued, gave a fillip to the domestic demand for housing, thus pushing the building boom to a peak in 1876. The inverse phasing resulted from "the extremely rapid reversal of the U.S. building cycle together with

\textsuperscript{65}Ibid, p. 29.
a rise in British net emigration to levels previously unattained either absolutely or per capita."66

Between 1871 and 1881, the net decennial rate of out-flow was seven per thousand population. This increased to 23 per thousand in the next decade and then fell to two per thousand in the 1890's. The added impetus to the domestic rate of population (urban) growth contributed to the building boom of the 1890's which coincided with a downswing in the U.S. transport-building cycles.

"Thus it seems that Lewis and O'Leary may have been correct in suggesting that the alternation of the U.K. and U.S. Building Cycles "was a sheer accident" though the causes of this accident did not lie, as they suggest, in the effects of the Napoleonic Wars, but rather in the different demographic, technical and speculative determinants of the building cycles in the two countries around the 1870's."67

Once out of phase, the two opposing building cycles were linked by the waves of migration across the Atlantic. Coppock outlines a causal mechanism based on the assumption that the building cycle in Great Britain was dependent upon the transport-building cycle in the United States. This assumption seems

66 Ibid, p. 30

67 Ibid.
justified for the following reasons: First, long swings in U.S. building activity are evident as early as the 1830's. Second, the waves of immigration which coincided with and contributed to the building cycles in the U.S. had their origin in many European countries. "It is easier to see the emigration waves from the U.K. as part of a general response to the pull of the U.S. boom than as the factor which generated the U.S. boom and so made possible the emigration waves from other European countries."68 With this, then, house-building in Great Britain responded primarily to shifts in population, stimulated by waves of railway construction and house-building overseas.

Although Coppock does not discuss the role of capital and foreign investment in the determination of British house-building, he does raise an important issue, without realizing it, with respect to consumption and the capital transfer, and their combined potential impact on the housing sector. The decline in home investment during an upswing in building overseas releases potential savings for foreign investment. "But capital export must be effected via the balance of payments

and potential savings will vanish if the U.K. economy becomes seriously depressed.\textsuperscript{69} The British export booms accompanying the long swings in overseas investment helped to effect the transfer. It is important to recognize that the secular swings in British imports and consumption in phase with home investment also eased the capital transfer.\textsuperscript{70} At the same time, however, a decline in consumption expenditures must have had a depressing effect on the demand for house space, thus intensifying the depression in building coincident with a wave in overseas investment.

A second contribution to the study of long swings in British house-building was made by Cooney in an article presenting new data on lathwood imports which suggested that prior to the 1860's "there were no major fluctuations of greater length than the business cycle in British building activity."\textsuperscript{71} The 1870's are viewed as a major turning point in British economic development. The most significant change is the growing importance of foreign investment in governing the course of domestic house-building.

\textsuperscript{69}\textit{Ibid}, p. 23

\textsuperscript{70}Lewis and O'Leary, "Secular Swings in Production and Trade" p. 124-5.

Major fluctuations in residential construction result from variations in the supply of capital caused by secular swings in the volume of foreign investment. Building finance suffered from investor preference for readily negotiable foreign government and railroad bonds. During periods of expansion this preference was dominated by the expectations of greater profits from investment abroad. Another factor contributing to depressed building activity during a foreign investment boom was the inability of the construction industry to successfully compete with an expanding export sector for labour and materials. Increased emigration further reduced the supply of labour to the building industry.

Cooney emphasizes the relationship between home and foreign investment and internal migration and emigration outlined by Cairncross. Further, he stressed the importance of long waves in the economic development of America in governing the time-shape of British building. Minor exception to this influence is taken with respect to the great building boom centered on 1900. Several independent factors are recognized as having amplified this major fluctuation, including the introduction of electricity, development of municipal tramways, and the rise in real incomes between 1880 and 1900. "It would be difficult to argue that these, even taken together, are more likely than the overseas influence to account for the
particular timing of the building boom of 1895 to 1905 but they surely added a good deal to its amplitude.\textsuperscript{72}

The first disaggregated study of house-building in Great Britain from 1890 to 1914 led S.B. Saul\textsuperscript{73} to seriously question the sensitive reactions of the building industry implied by the foreign investment-building cycle link in the systematic operation of an "Atlantic economy." Basing his analysis on the statistics of houses erected and house plans approved in a large number of towns significant differences in the actual pattern of building activity are shown to exist between different parts of the country. This raises the serious question of how the international investment migration mechanism is transmitted to the heart of the building industry, i.e., the local market. Saul's answer is that investment in housing was largely determined by factors specific to the local housing market.

Accounts in contemporary trade literature state that the level of vacancies is often used by builders as a guide to market conditions. Information from the British censuses of 1901 and 1911, and what little fragmentary evidence exists on empty houses in various towns, appears to indicate that

\textsuperscript{72}Ibid, p. 267

there was wide local variation in the lagged response of the building industry to this indicator.\textsuperscript{74} The question raised here will only be resolved by more intensive study of local market conditions, particularly, the role of empty property. Unfortunately, little information on vacancy rates is available.

Perhaps the most important local factor contributing to the determination of house-building patterns in Great Britain was the essentially speculative character of the house-building industry. From regular reports on building activity in Birmingham, published in the \textit{Building Societies' Gazette}, Saul has assembled valuable evidence of this industrial propensity:

"The first interesting feature is the considerable amount of speculative building reported during the early nineties despite the fact that rents were very low and sticky, and costs high ... It was not so much a question of "want" for houses as an opportunity made available by land owner and speculator. By 1895 speculative building was "never so rampant" and the correspondent argued that "no doubt the plethora of money is encouraging the building fever, for private mortgages are obtained before the securities are finished, the competition for investments being heavier than ever."\textsuperscript{75}

\textsuperscript{74} \textit{Ibid}, pp. 126-129.

\textsuperscript{75} \textit{Ibid}, p. 130.
In many cases rents may have played only a minor role in the decision to build. In Birmingham, for example, they began to increase rapidly only after 1897, but the housing boom got underway well before then. Again, our knowledge of local rent levels and their influence on the course of house-building is very limited.

Saul recognizes the potential influence of the age and marital structure of emigrants on the demand for housing; also the importance of internal migration in reinforcing the pressure on urban housing supplies when emigration was low. But he concludes that, "it is hard to believe that migration of itself could account for more than a small part of the wide fluctuations in house construction." In support of this statement statistics are cited showing similar fluctuations affecting all types of houses, while the great majority of emigrants were from the working class. Furthermore, he argues that internal migration responded to specific domestic conditions in the coal, woollen and engineering industries and in no way was this "an indication that housing responded to changes in population brought about by any international pattern of behavior." 

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77 *Ibid*, p. 132
With respect to capital, it is possible that the mortgage market suffered from the rapid growth of alternative investment opportunities in a domestic financial market which was quickly diversifying. However, no evidence can be found to support the view that booms in house-building came to an end because capital was diverted to other uses (eg. foreign investment):

"All this, and the wide differences in experience between one area and another, make it difficult to escape from the view that building was internally and positively determined ... by the state of demand and by the nature of the operation of the trade itself." 78

In the aforementioned Coppock study, the British trade cycle after 1870 is considered a hybrid cycle whose periodicity and amplitude are explained by the inverse phasing of long swings in domestic house-building and export production. 79 This view has been challenged by H.J. Habakkuk in an exhaustive article on fluctuations in British house-building in the Nineteenth century:

"It was the long swings which were the epiphenomena and the trade cycles the reality, in the sense that when the character of the individual cycles has been explained there is no residue which needs to be attributed to the behavior of a long cycle." 80

79 Coppock, "Causes of Business Fluctuations", p. 12
80 H.J. Habakkuk, "Fluctuations in House-Building in Britain and the United States in the Nineteenth Century", *Journal of*
Residential building in Great Britain before the 1860's fluctuated with the trade cycle, and thus did not exhibit the 20 year swings typical of the transport-building cycle in the United States. The appearance of major secular fluctuations in British house building, inverse to those in the U.S., is explained not only by structural changes in the character of British building cycles but also by the fact that the "trade cycles in Great Britain no longer came to a violent end but the American ones often did."  

Habakkuk stresses the importance of domestic factors in explaining why the relation between the trade cycle and fluctuations in building should have changed. During the second half of the Nineteenth century many of the influences which had formerly stimulated house construction in the initial stages of the trade cycle were weakened. Internal migration became less responsive to the expansion and contraction phases of the trade cycle. One reason for this was the increased number of middle-class migrants. Structural changes in the capital market imposed further restraints on the expansion of house-building during a trade cycle upswing. The

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proliferation of financial instruments had an adverse impact on the desire of investors to hold mortgages. "Moreover, the development of joint-stock banks, while it may have made it easier for builders to obtain advances, also made the bank deposit an alternative asset to the mortgage."\(^{82}\) Of course, increased incomes generated during the trade boom had a favorable influence on the demand for housing. The various changes mentioned above had the effect of increasing the lagged response of the building industry to changes in demand, thus allowing a backlog of excess demand to build up and residential construction to persist after the downturn in the trade cycle. Other factors associated with the downturn also helped to sustain the boom in house-building.

"The growing stability of the banking system after mid-century and the increase in the range of assets available, while they reduced the power of building to compete for funds during a boom, greatly improved its position during a depression. The downturn ceased to be accompanied by a general commercial and financial convulsion ... "\(^{83}\)

"Absence of a commercial panic affected not only the availability of finance for building, but also effective demand for houses. The point

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\(^{82}\) Ibid, pp. 207-08.

\(^{83}\) Ibid, p. 208.
is not merely that stringencies of the boom meant there was an unsatisfied demand for houses at the level of income prevailing during the cyclical boom, but that the level of income was better sustained during the depression."\textsuperscript{84}

That these changes produced long swings is explained by the gradual "shift in the balance of favorable and unfavorable forces."\textsuperscript{85} Thus, there was a growing number of regional long cycles out of phase with one another. The increased importance of suburban building which persisted for longer periods also contributed to the long waves in British building activity.

Habakkuk devotes considerable space to a discussion of various possible influences that variations in the pattern of migration and capital flows might have had on the course of domestic house-building. He suggests that inverse building cycles may, in part, have been the result of secular swings in emigration only insofar as this worked through a change in internal migration leading to increases in the rate of urbanization. The outflow of population was governed by fluctuations in the prosperity of developing regions overseas. These regions, by borrowing larger sums relative to British domestic investment than ever before and by issuing securities comparable

\textsuperscript{84}Ibid, p. 209

\textsuperscript{85}Ibid.
to and competitive with housing finance, tended to further reduce the supply of funds for building in the upswing of the trade cycle. These influences, however, are repeatedly underplayed in the course of Habakkuk's argument.

The first long swing in British building activity is explained primarily by the fact that the trade cycle boom of the late 1860's and early 1870's was not followed by a financial crisis, and that industrial activity continued at a relatively high level after 1873. The boom in railway construction and house-building abroad may have had some influence but not in the direct way implied by the working of an "Atlantic economy".

The building depression which set in after 1876 was exceptionally prolonged, spanning as it did not one but two trade cycles. Habakkuk suggests that one reason why a building boom failed to gain momentum in the late 1880's was that the prominent industries (exports and ship building) which dominated the trade revival in those years were located in areas where there was excess capacity and high unemployment. Thus, large increases in output could be achieved with relatively little internal migration. The main explanation, however, is found in the unprecedented waves of development overseas in the United States, Australia, Asia and South America. High levels of emigration and foreign investment were sustained for
a longer period than ever before. "This is the only occasion on which foreign influences clearly deflected British building fluctuations from the course they would otherwise have taken." The primary link was through emigration. But even here, the rate of outflow of population was partly determined by domestic factors. The agricultural depression of the late 1880's provided a strong push element in the rural outflow. Capital flows played a part but were "pushed abroad rather than pulled." Low interest rates and the difficulties building societies experienced in loaning funds are cited as evidence of a dearth of investment opportunities at home.

The final decade of the Nineteenth century opened with financial crises in Argentina, and South America, and the Baring Crisis at Home. This made investment overseas less attractive and helped divert funds to the home market. Thus, it is claimed that an abundant supply of loanable funds "allowed the building boom of the nineties to develop on a larger scale than might otherwise have been the case." But the most important factors determining the building boom in the late 1890's were domestic in origin. The industrial booms that took place in that decade were concentrated in new industries located in areas where there was no significant excess supply

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86 Ibid, p. 224.

of labour. Consequently, a revival in trade led to considerable internal migration and urbanization.

An added impetus to the upswing in building activity was provided by the increase in suburban building resulting from the application of electricity to transportation in Great Britain. The United States began using electrical transportation systems in the 1880's, this being one reason why there was a high level of building activity in America during that period. "Thus the alternation of American and British housing activity in the eighties and nineties partly reflects the different rate at which electricity was applied to traction in the two countries. This is, in the present context, almost certainly fortuitous."\(^{88}\)

The aggregate indices of house-building in Great Britain fall off after 1903. This, however, conceals the considerable differences that existed in the local patterns. The building boom just ended was mainly influenced by the internal rate of migration. This, on the other hand, was not so much caused by the subsiding wave of emigration, but rather by changes in the distribution of British industrial activity.

\(^{88}\) Ibid, p. 227.
"There is no need to invoke foreign influences, and if they are invoked it can be argued that the demand of the primary producing regions for English goods in these years did more to stimulate building in England than their demand for migrants and funds did to suppress it."\(^8^9\)

The scepticism of Lewis and O'Leary, Saul and Habakkuk with respect to the systematic set of inter-relationships implied by the hypothesis of a working international economy, is not shared by A.R. Hall. Though Hall is not specifically concerned with investment in residential construction, this is seen as a major component of total domestic investment whose fate was governed by the development of a world economy after 1870. Thus, the pattern of home investment (and consequently house-building) is influenced by events abroad as well as factors of specific local origin. This leads to a rejection of the hypothesis that the central locus of economic stimulus within the world economy was continuously located in one region. "It could and did shift from region to region among the areas of recent settlement and between those regions, regarded as a single entity, and Europe and within Europe to Britain in particular."\(^9^0\)

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\(^8^9\) _Ibid._

The case for a single-cause explanation of the dynamic reaction process giving rise to secular swings in the volume of economic and demographic activity is, according to Hall, a weak one. Inverse phasing of regional investment cycles cannot simply be attributed to changes in the expected rate of return on new investment, or the natural rhythm of international migration, or shifts in the terms of trade, or changes in the willingness of British investors to lend abroad.

"... it depended on the complicated interplay of all these variables, and numerous others. Changes in any one of them reacted on the others but not in any simple way. The nature of the reaction to any one ingredient was not always identical because the conjecture of other factors when such changes occurred was not always the same."\textsuperscript{91}

Thus, great emphasis is placed on the multiplicity of inter-relationships that linked Europe to the New World. The flow of goods and services (items of invisible trade) as well as capital, labour and technology altered demand and supply relationships in product and factor markets around the world. This tended to lengthen the process of expansion well beyond the period that would have existed had these changes not occurred. International financial stability, resulting from a smoothly functioning gold standard, helped to facilitate the adjustment process.

\textsuperscript{91}Ibid, p. 10.
An extensive and informative study of building fluctuations in Great Britain is J. Parry Lewis' *Building Cycles and Britain's Growth*. Drawing heavily on historical fact and the unpublished research material of the late Bernard Weber, a number of causal relationships are presented, not as a theory of the building cycle, but rather as a "theory of building cycles in the plural, in which alternative possibilities are allowed to operate." The elements of the theory are derived from the works of Jevons, Hawtrey, Cairncross, Thomas, and Frisch, all on various aspects of cyclical behavior in the course of economic development. Population, credit and shocks are of central importance, and it is in regard to the last mentioned factor that Lewis' major contribution to the study of building cycles is to be found. Contemporary statistical analysis allows for shocks by adding them to relationships as "errors". These errors "represent everything about which we do not know enough to have a measure", and are assumed to be well behaved in a typical Gaussian fashion. What Lewis has taken pains to emphasize is that shocks strike directly at the foundations of the structural relationships on which they are assumed to have no influence. Rather than additive

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93 Ibid.
with zero mean, they may be more appropriately treated as multiplicative with cumulative effects. In any case, shocks should be studied within their context as perhaps the most important dynamic factor in the process of structural change.\(^{94}\)

Operating through harvests or other factors that affect the food supply, shocks will alter real incomes and directly affect the population through natural increase and the decision to emigrate. House-building is shown to be influenced by a far greater number of complex forces than has hitherto been recognized. The impact may work through changes in age-specific marriage and birth rates altering the age-structure of the population. Economic factors affecting the volume of migration, though numerically small compared to total population, may have a profound influence in their effect on its age and sex structure or its industrial composition. These changes are not only important for their immediate effects but may have a considerable lagged impact (for as long as a generation or more) on the demand for housing accommodation, the supply of labour (through echo effects) and the distribution of income.

Shocks also work through the monetary sector in their influence on house-building. For instance, how and to what extent

\(^{94}\)Lewis proposes to do this, with the aid of a computer, in the development and testing of a simulation model of house-building activity. Perhaps the neglect of this problem is one reason why the econometric models of the housing sector that have been tested have proved so unsatisfactory.
is the availability of credit for construction affected by the impact of harvests on the balance of payments? Again, the importance of considering shocks in their context is stressed: "When credit is strained, a 'bad' shock is very likely to precipitate a crisis, while a 'good' one may, if it is of the right kind." Population and credit are linked in Lewis' theory through this type of consideration. As young people enter the labour force and begin to earn incomes, they constitute a potential demand for housing. The possibility of realizing this demand is enhanced if a shock that raises real incomes takes place when credit is abundant.

Brinley Thomas recently addressed himself to the arguments of Habakkuk and Saul in a regional study of population and house-building in the Midlands, the countries surrounding London, the North West of England, Yorkshire, Northern England, South Wales and Monmouthshire, and London. The population data used in this study were collected from census records, and the Inhabited House Duty statistics provided a basis for regional building estimates. It was assumed that the age group 20-44 constituted the "vast majority of the house-seeking section of the community." The purpose of the analysis was to determine

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95 Ibid, p. 221.
96 Brinley Thomas, Demographic Determinants, passim.
97 Ibid, p. 6.
the relationship between changes in the population aged 20-44, separating the effects of both natural increase and migration, and net changes in the housing stock. The results led Thomas to conclude:

"... nationally and regionally the swing in house-building follows with a lag the swing in the population aged 20-44 as determined by migration ... The inverse relation between internal and external migration is clearly shown. When internal migration was high, emigration was low; and it was in those years that building, with a lag, expanded; the opposite occurred when internal migration was low and emigration was high. The swings in house-building conform to the swings in the migration-dominated curve of population change."  

Drawing on the recent researches of Burnham Campbell on building fluctuations and demographic changes in the United States, Thomas reaffirms the conclusions of Migration and Economic Growth. The mechanism of the migration cycle is the major determinant in the process of interaction between the economies of Great Britain and the United States.

The existence of a real building cycle determined by migration contradicts Habakkuk's claim that the only real cycle was the trade cycle. The relative similarity of regional

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98 Ibid, p. 17.

building patterns, (excluding London and South Wales), does not support Habakkuk's conjecture about lack of synchronization between regional fluctuations.

The debate that has grown up around the problem of house-building in Great Britain does, to a large extent, involve substantive issues. Yet one cannot help but be aware of the limitations imposed by the choice of a unique point of departure. Thomas is surely correct in emphasizing the role of population and long waves in international and internal migration, but a migration cycle cannot be taken as a datum. People are not lemmings, they move from one area to another for a wide variety of reasons; many are economic, but some are not. Implicit in the debate is the question of why migration, both external and internal, took place; it is at this juncture that more light needs to be shed.

From this brief discussion it is clear that the mainstream of debate over proffered explanations of the long swings in British house-building from 1860 to 1914 has centered around a few prominent factors. Very little attention has been directed to some of the more important institutional problems raised in the previous section. To some extent this may be owing to a dearth of information. Yet one suspects that the real reason is that these institutional problems require more concentrated study at the local level.
CHAPTER IV

THE PROBLEM OF AGGREGATION: REGIONAL AND LOCAL BUILDING CYCLES

REGIONAL AND LOCAL DIFFERENCES IN THE COURSE OF HOUSE-BUILDING ACTIVITY

Various aspects of the building industry in Great Britain have become the subject of much research and debate among economic historians in the past fifteen years. Of special interest, as we have seen, is the role this industry played not only in the development of the domestic economy, but also in the functioning of what we, following others, have referred to as the "Atlantic economy". In response to the growing interest in aggregate analysis a number of studies have produced national indices of building costs and house rents.\(^1\) The greatest attention, however, has centered around the appearance of long swings in the course of British house-building after 1860. Much of


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the discussion in Chapter II was concerned with this phenomenon and the most important attempts that have been made to construct a national measure of fluctuations in building activity. In the last chapter we briefly surveyed the various hypotheses that have been put forward to explain this behavior. In general these explanations have been formulated in highly aggregative terms. There are, however, a number of methodological problems that become very important and of which one must be fully aware when this aggregative approach is used for analytical purposes.

The housing market is a local market and therefore has a local equilibrium.

In Chapter I we stressed the importance of analyzing the course of house-building at a level (of aggregation) where the underlying behavioral implications were consistent with historical fact. This is a critical point. To attempt an explanation of the behavior of an aggregate index of residential construction by comparing it to other aggregate measures such as, for example, a national rent index, the net annual increase in total population, or perhaps some index of the cost of credit e.g. the yield on 21/2% Consols, etc.,
is a hazardous exercise and may be seriously misleading. A plausible relationship suggested at this level of analysis may differ significantly from that existing in many of the individual towns or regions included in the aggregate house-building index. This will be especially true if there exist considerable differences in local and regional house-building patterns.²

This problem has not gone without recognition. It has been discussed (all too briefly) by Cairncross³ and Derksen⁴ among others; yet as Lewis points out "some of those who have made it have proceeded to ignore it, or minimize its importance."⁵

²Saul, "House-Building in England, 1890-1914", p. 122; Lewis, "Building Cycles: A Regional Model and its National Setting", p. 520. A good example was presented in Chapter I, where in a one-country, two-region model internal migration was assumed to be causing a dramatic divergence of regional house-building patterns. In this case an analysis in aggregate terms would be incapable of providing an accurate explanation of the operative causal mechanism in the course of residential construction at either the national or regional level.

³Cairncross, Home and Foreign Investment, p. 11.

⁴Derksen, "Long Cycles in Residential Construction: An Explanation", p. 100.

⁵Lewis, "Building Cycles: A Regional Model", p. 520.
In recent years a number of noteworthy studies by Richards and Lewis,\(^6\) Kenwood,\(^7\) Saul\(^8\) and Lewis\(^9\) have produced a considerable volume of local evidence indicating substantial differences in local and regional house-building patterns. A steady recovery of the building industry in Stockport after 1895 coincided with a sharp downswing in Crewe, interrupted by only minor reversals. From 1900 to the First World War house-building also declined in Sheffield, while Coventry experienced a major upswing after 1902. The period 1875 to 1900 witnessed an almost perfect inverse relationship between the cotton town of Rochdale and the Bristol Channel coal and iron port of Cardiff. London had a minor downswing from 1867 to 1872 and then proceeded to rise to a major peak in 1880; a steady decline to 1886 was followed by a prolonged trough in building activity ending finally in the upswing that got underway in 1896. Glasgow, on the other hand, experienced a boom in


\(^8\)Saul, "House-Building in England, 1890-1914", pp. 120-121.

house-building from 1865 to 1876; a precipitous fall over the next five years was followed by a very long gradual recovery to the double peak of 1898-1902. There were, of course, towns that followed quite similar courses. Both Salford and Birmingham reveal the same cyclical pattern traced by Glasgow after 1874. The distinct contrast between many towns, however, (the above list is only a small sample) points to the need for and importance of more intensive study of the regional or local house-building experience.

A REGIONAL MODEL OF HOUSE-BUILDING

The model presented below is used here only to illustrate basic relationships that may be expected to exist at the local or regional level. The structure of the relationships has not been specified, although some indication of expected forms will follow in the discussion. Many of the ideas expressed here can be found in a very interesting article by J. Parry Lewis in which a simplified, linear regional model of housing cycles is developed.

We begin by defining a housing market area the boundaries

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10 Lewis, "Building Cycles: A Regional Model", passim.
of which are determined by the distance people are willing to travel to work. This may be a single town or a region (e.g. valley) in which a number of communities are located. Capital and labour are employed in two local industries. The primary industry employing the majority of local capital and labour produces a commodity with a large external demand component. Examples might be coal for export or cotton textiles. The second industry is house-building. The community imports food and other goods and services. All prices are fixed with the exception of rents (the price of housing accommodations) and the price of the commodity produced by the primary industry. For convenience, the latter commodity will be referred to as cotton textiles.

The demand for cotton textiles \( (D^c) \) is assumed to be a function of its price \( (p) \) and external factors summarized by the variable \( (X) \). Thus,

\[
D^c = f^d_c (p, X)
\]

where \( df^d_c / dp < 0 \) and \( df^d_c / dX > 0 \).

The rate at which cotton textiles are supplied \( (S^c) \) depends on the amount of labour \( (n^c) \) and capital \( (k^c) \) employed in the cotton textile industry:
\[ S^C = f^S_{C} \left( n^C, k^C \right) \]  

(2)

The rate at which the supply of labour available to the cotton textile industry is changing \( (n^C) \) depends on the level of wages in the two industries, \( (w^C) \) and \( (w^B) \) as well as the way in which the total labour force \( (P) \) is changing. This may be represented as

\[ \dot{n}^C = g^n_{C} \left( w^C, w^B, P \right) \]  

(3)

where \( \frac{dg^n_C}{dw^C} > 0 \), \( \frac{dg^n_C}{dw^B} < 0 \) and \( \frac{dg^n_C}{dP} > 0 \).

Although it is mathematically messy, it should be recognized that the adjustment of the labour supply in the production of cotton textiles in response to a change in relative wage rates may involve a considerable lag. This would be especially true if the mechanism required a change in \( P \), through migration, for example.

The level of wages in the primary industry is assumed to be some function of the price of output \( (p) \):

\[ w^C = h^w_{C} \left( p \right) \]  

(4)

where \( \frac{dh^w_C}{dp} > 0 \). This assumption may be rather difficult to support as an accurate description of the determination of wages in cotton textiles. On the other hand, it does conform
closely to the process in the coal mining industry, as we shall see in the next chapter. In any case, it may not be all that much a travesty of the facts.

Changes in the supply of capital for cotton textile production depend on relative rates of return to capital employed in the primary industry (r^c) and the construction industry (r^b), as well as the behavior of the total capital supply (K). This may be written

\[ \dot{k}^c = g^k_c (r^c, r^b, K) \]  \hspace{1cm} (5)

where \( \frac{dg^k_c}{dr^c} > 0 \), \( \frac{dg^k_c}{dr^b} < 0 \) and \( \frac{dg^k_c}{dK} > 0 \).

The rate of return (or rate of profitability) in the cotton textile industry depends on the price of the output and the level of wages. Thus

\[ r^c = h^r_c (w^c, p) \]  \hspace{1cm} (6)

and \( \frac{dh^r_c}{dw^c} < 0 \), \( \frac{dh^r_c}{dp} > 0 \).

The price of cotton textiles depends on the state of the market; price changes are related to the level of excess demand or supply. We write

\[ \dot{p} = h^p_c (D^c, S^c) \]  \hspace{1cm} (7)
where \( \frac{dh_c^p}{df} > 0 \) and \( \frac{dh_c^p}{df} < 0 \).

We now consider the housing sector. The total demand for houses \( (D^b) \) is related to population \( (P) \), i.e., our labour force variable, rents \( (R) \) and incomes. For convenience, changes in income are identified with changes in industrial wage rates. This may be written

\[
D^b = f_d (P, R, w_c, w_b)
\] (8)

where \( \frac{df}{dP} > 0 \), \( \frac{df}{dR} < 0 \), \( \frac{df}{dw_c} > 0 \) and \( \frac{df}{dw_b} > 0 \).

The total stock of houses is represented by \( (S^b) \), thus the current rate of supply \( (S^b) \) is assumed to be a function of the amount of labour \( (n^b) \) and capital \( (k^b) \) engaged in house-building:

\[
S^b = f_s (n^b, k^b)
\] (9)

with \( \frac{df_s}{dn^b} > 0 \) and \( \frac{df_s}{dk^b} > 0 \).

The rate at which the supply of house-builders changes \( (n^b) \) depends, as in the case of cotton textiles, on the level of wages in the two industries as well as exogenous changes taking place in the total labour force. Thus

\[
n^b = g_n (w^b, w_c, P)
\] (10)

and \( \frac{dg_n}{dw^b} > 0 \), \( \frac{dg_n}{dw_c} < 0 \), and \( \frac{dg_n}{dP} > 0 \).
Here also, we can assume a lagged response of building employment to industry requirements. This is, in part, a direct consequence of an additional assumption that building wages are institutionally (exogenously) determined. Thus, to some extent the level of building activity is constrained by the level of production in the primary industry, assuming full employment.

The supply of capital available to the building industry ($k^b$) will depend on the relative rates of return in the two industries, the behavior of the total capital stock ($K$) and an independent supply of capital generated through the formation of building societies ($B$). Changes in this rate of capital supply may be expressed as follows:

$$\dot{k}^b = \dot{K} - \dot{k}^c + \dot{B}$$ (11)

The rate of return to capital employed in the supply of new houses ($r^b$) is assumed to be a function of rental rates ($R$) and the costs of construction, here represented by ($w^b$);

$$r^b = h^r_b (R, w^b)$$ (12)

where $\frac{d h^r_b}{d R} > 0$ and $\frac{d h^r_b}{d w^b} < 0$. 
The level of rents is related to the conditions of supply and demand in the housing market as a whole. Changes in this level will depend on the extent to which there is an excess demand for or supply of housing accommodation and for how long this has persisted. The degree to which rents are sticky will in large measure determine the length of the lag in the building industries response to changes in demand. Thus

\[ R = h^r_b \left( b^b, s^b \right) \]  (13)

where \( \frac{d h^r_b}{d f^d} > 0 \) and \( \frac{d h^r_b}{d f^s} < 0 \).

These thirteen equations make up our regional model. Of the 18 variables, 5 are exogenously determined: \( X, P, K, B, w^b \). Assuming the structural specifications of the model results in 13 independent and consistent equations, it is possible through successive elimination of the endogenous variables to derive a single equation expressing house-building as a function of population and the other four exogenous variables:

\[ V_n \frac{d n^b}{dt} + \ldots + V_1 \frac{d s^b}{dt} = F \left( X, P, B, K, w^b \right) \]  (14)

where \( V_1 \ldots V_n \) are algebraic functions of the structural
parameters and \( n \) is determined by the specification of the model.\(^{11}\)

This expression captures the various forces, both internal and external, that come to bear on the housing sector, in a single \( n^{th} \) order differential equation. There are six parts to its solution. One component is derived from the characteristic equation obtained by setting the left hand side equal to zero.

\[
V_n \frac{d^h s^b}{dt^n} + \ldots + V_1 \frac{ds^b}{dt} = 0 \tag{15}
\]

We can expect this equation to have at least one real root which may be explosive or damped. It is unlikely that all \( n \) roots will be real, however; thus, a solution will probably give rise to cycles. These, also, may be damped or explosive.

In addition to the component arising out of the characteristic equation, there are five additional components, each derived from one of the exogenous variables on the right side of the equation. If any one of these factors is subject to cyclical behavior, then this will be reflected

\(^{11}\)The function \( F \) will contain one or more derivatives of each of the exogenous variables.
on house-building activity. For example, the existence of transport-building cycles overseas in developing countries with a high marginal propensity to import cotton textiles (or coal, etc.) may generate similar fluctuations in domestic residential construction through changes in \( X \). Depending on the strength of these linkages and the lag structure of our model, these fluctuations may follow closely or inversely the pattern abroad.

Our population variable may also be a source of instability. If there is a natural migration cycle, or if developments abroad cause waves of emigration (independent of any specific regional factors), these movements will be reflected in local building construction. It might be more realistic to argue that rates of emigration are related to interregional as well as inter-national wage differentials. The rate of increase of total population (\( P \)) could then have an exogenous component plus a component related to such wage differentials. The regional model (as opposed to simply a national model) within the context of other regions making up a nation, is subject to two important demographic influences: one is the flow of population between regions, the other is the flow between nations.\(^{12}\)

\(^{12}\)In addition, the population curve may have a natural growth component as well as a superimposed oscillatory growth component. These characteristics would then also be present in the building curve.
Although the other exogenous variables are a potential source of cyclical influence, we can expect conditions of external demand (X) and population behavior (P) to be the most important variables working through the function F. The capital factor (K) for example, might be subject to fluctuations resulting from movements in the balance of payments, but before this could be determined it would be necessary to define more clearly what the variable (K) represents. Capital made available to the construction industry through the activities of building societies might reasonably be expected to follow changes in the regional population. Thus, a wave of in-migration would result in the formation of new building societies or increased sales of subscriptions to existing ones in order to transform the increased housing need into actual construction.

The regional pattern of building activity given by the solution of equation (14) will have six additive components which may be summarized as follows:

a) A component resulting from the internal structure of the regional economy, which may be damped or explosive, and which may be cyclical.

b) A component arising out of population movements, which may reflect both growth and cycles.
c) A component due to fluctuations in external demand.

d) Potential cyclical components resulting from the behavior of K. B. and w.  

Endogenous cycles in house-building generated by the simple model developed by Lewis were found to be heavily damped.

"... heavy damping seems to be more plausible course of events in an economy of the kind we are considering when looking at this characteristic equation. With a constant population and external demand it does not seem likely that workers will move to and from coal to building without settling down to some approximate equilibrium long before eighteen years have passed."  

If there is to be an undamped regional long cycle in house-building, it will probably be a consequence of recurrent destabilizing fluctuations in the exogenous components.

**IMPLICATIONS OF THE REGIONAL MODEL FOR THE COURSE OF HOUSE-BUILDING AT THE NATIONAL LEVEL.**

In this chapter we have emphasized the importance of analyzing the building cycle regionally or locally. Two

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important reasons have been given in support of this methodological position. First, there is extensive empirical evidence that the course of house-building differed significantly among many different towns. Second, the housing market is by its very nature a local market, and "the mechanism of the building cycle can be properly determined only by thinking of regional or local cycles in their natural setting."\(^{14}\) This, of course, does not imply that aggregate analysis based on national building data is of little or no value. A period of over-riding national prosperity may have a very favorable effect on regional and local conditions throughout the country. We might thus find the course of house-building in a wide range of areas to be following relatively similar patterns. During such periods the national total of house-building will in all probability be higher than at other times. Under such circumstances, broad generalizations based on the analysis of aggregate measures may be both meaningful and illuminating. A problem arises, however, when the pattern of response to dissimilar (as well as similar) economic conditions is significantly diverse on a regional or local basis. An argument

\(^{14}\textit{Ibid}, p. 533.$
in aggregative terms will now inevitably result in conclusions that are misleading.

Let us consider a country in which there exist two or more regions defined along the lines indicated at the beginning of the last section. We can represent each of these regions with a set of equations similar to those listed above, although with different parameters and structural specifications. Thus, in each region building activity may be described by an equation of the form

\[ S^b = f(t) + F(X,P,B, \ldots) \]

where \( f(t) \) is the endogenous part of the solution determined by the internal structure of the regional economy and derived from the characteristic equation. The \( F \) function represents that part of the solution arising from the exogenous components. To the extent that there is inter-regional trade, migration or capital flows, etc., the behavior of the exogenous variables in one region will affect the behavior of the same variables in other regions.

A more elaborate model could be specified to take into account these inter-regional flows. The labour force variable \( (P) \), for example, would then have an endogenous
component related to, say, inter-regional wage differentials, as well as an exogenous component. It might be argued that wage rates overseas are a relevant factor in the decision to emigrate. This could be allowed for by incorporating the foreign wage rate into the exogenous component of the labour force variable. There are clearly an infinite number of models that could be specified. We are simply considering here, fluctuations in residential building as primarily governed by changes in local conditions of supply and demand however they may come about.

At times there will be considerable local differences in the course of house-building. In terms of our model, the various regional building-supply equations will exhibit cycles, the phasing, amplitude and period of which, will all be different. It is not difficult to imagine a case in which several regional patterns that are out of phase are maintaining an aggregate balance in terms of volume changes. This may show up as a plateau in a national building index. One or more of these regional patterns may have an explanation in terms of the national demand for light manufactured goods, others in terms of the export demand for coal, and still others in terms of changes specific to the cotton textile industry. The stable behavior of the aggregate index fails
to indicate these differences. To hazard an explanation of the national pattern by comparing the aggregate building index to other aggregate economic and demographic measures will, under these circumstances, invariably result in conclusions that are to some extent erroneous (i.e. do not have general applicability). For this reason alone it is desirable to look in greater detail at the course of house-building at the local level.

At other times, several regional upswings in residential construction may coincide. This may be due to fortuitous events of a specific local character that are favorable to house-building, or a wave of national prosperity (resulting, perhaps, from a favorable shift in the terms of trade) that leads to similar movements of comparable variables across all regions. In either case a national building boom will result. But as Lewis points out, this period of generally high building activity may come to an end in two different ways.

"It may be that in several of the regions the various local demands become quickly satisfied so that there are fewer and fewer regions of high activity. Total demand falls because local demands have become exhausted for quite natural and possibly different reasons. On the other hand there may be so many local booms of intensity that eventually the strain
on national resources becomes too great. There are not enough men, materials, or credit to allow the boom to continue." 15

Now, if it is plausible to speak of a limit or ceiling on the national level of building activity imposed primarily by the availability of scarce national resources for employment in the construction of dwellings, then it might be possible to distinguish between major fluctuations in house-building that have local or regional origins (i.e. lie below the ceiling) and those that have their explanation in the limitations imposed by the supply of national resources (i.e. reach the ceiling).

If such a distinction is possible it would imply that each major downturn should be studied separately. It would be a mistake to apply the explanations of those with local or regional origins to all major downturns. This, then, is another reason for examining more closely the regional and local components of aggregate house-building indices.

In the following chapters we propose to do this for the coal mining region of South Wales and the cotton textile region of South-east Lancashire. The ideas underlying the general regional model outlined in this chapter provide a

15 Ibid.
useful conceptual framework for these regional studies of house-building activity in Great Britain. Specifically, we will focus on those demographic and economic factors arising out of the internal structure of the regional economy as well as external forces which transcend regional boundaries to determine the regional pattern of house-building activity.
CHAPTER V

RESIDENTIAL CONSTRUCTION IN THE
SOUTH WALES COALFIELD

A REGIONAL INDEX OF HOUSE-BUILDING IN SOUTH WALES

Bernard Weber published his aggregate index of residential construction in Great Britain in 1955. The following year, a comprehensive study of house-building in a particular region—South Wales, was undertaken by Hamish Richards and J. Parry Lewis.¹ The details of plans approved and houses erected contained in the registers of numerous local authorities were the basis of this study.²

In this chapter we will look in some detail at the course of house-building in South Wales as manifested in the regional index of Richards and Lewis. After comparing these results with the national (urban) pattern reflected in Weber's index we will present a tentative explanation of the regional experience, placing special emphasis on industrial and demographic factors


²Earlier we noted that the enforcement of Building By-Laws imposed certain responsibilities on local authorities. Local by-laws generally followed the guidelines issued by the Central Board of Health under the Health Act of 1848. Before construction could begin building plans had to be approved by a Town Surveyor and/or a local board that was set up after a certain degree of urbanization had been reached.

114
unique to South Wales. Our final task is to embark on a more extensive examination of the local components of the regional index than has previously been undertaken.

The many problems that confronted Weber in his analysis of house-building statistics, primarily those associated with boundary changes, the gestation period in construction, the lag between plan approval and actual construction and the variation in terminal dates for individual series were also relevant considerations in the construction of a regional index. The adjustments for these various factors differed in method from those employed by Weber. I have thus devoted some space to a discussion of this problem in Appendix II.

The regional index of house-building in South Wales is presented just below Weber's index of house-building in Great Britain in Figure 4. From a peak in 1858, house-building activity in this region fell steadily to a major trough in 1863. In the fifty years that followed the index never again fell to a point this low. The trough in the early 60's, the minor upswing that followed, and the trough centered on 1870 reflect the similar experiences of Swansea, Newport, Aberdare and Merthyr-Tydfil. The major peak in the
Figure 4

HOUSE-BUILDING INDICES FOR
GREAT BRITAIN AND SOUTH WALES

SOURCE: Great Britain, 1860-1914 - See Table XV, Appendix I
South Wales, 1860-1913 - See Table XVII, Appendix II
mid-seventies, however, is explained primarily by the very high activity in Swansea, Cardiff, Newport, Aberdare, Merthyr Tydfil, and Llanelly M.B. The downswing in the regional index from 1876 to 1879 results from sharp declines in all of the towns mentioned above except Cardiff.

The 1880's saw a substantial increase in residential construction. It has been argued that the development of new collieries in this period gave the industry sufficient momentum to safely absorb the trade cycle that turned down after 1885. A minor trough in 1888 is followed by an inexorable rise in the regional index to the unprecedented peak of 1897. This is explained not only by the continued growth of new colliery towns, but also by major building booms in Swansea, Cardiff, Newport, Mountain Ash, and Rhondda. House-building fell precipitously after 1897 to a major trough in 1900. This behavior in the regional index reflects a general trend with major depressions in all the towns represented in Figure 9 except Llwchwr, Ebbw-vale, Aberdare, and an unusual building spree in Merthyr Tydfil centered on 1900-01.

---

The first decade of the Twentieth Century witnessed a wide variety of local patterns. But the regional index followed a distinct and impressive course. A sharp rise in the first three years that just missed recovering the total loss in the previous three years was followed by a minor reversal in 1904, which lasted only two years. The recovery which turned into a major boom pushed the regional index to an unprecedented high in 1910. The South Wales index declines thereafter, reflecting a general depression in building activity in most towns before the First World War.

DIFFERENCES BETWEEN THE COURSE OF HOUSE-BUILDING IN GREAT BRITAIN AND THE SOUTH WALES COALFIELD

A comparison of the course of house-building in South Wales with that reflected in Weber's index of residential construction in Great Britain leads to some interesting conclusions. In 1863, when house-building in South Wales had fallen to an exceptionally low level, Weber's index shows a minor peak. The minor peak in 1867 and the trough centered on 1870 are roughly matched by a minor trough and steady upswing, respectively, in Weber's series. The major building boom of the mid-seventies is a prominent phenomenon
reflected in both indices. The downswing that follows reached bottom sooner in the regional index than in Weber's national index of residential construction.

Weber's study conveys the impression that for almost a generation after 1879, the British building industry was in a protracted state of depression. But this was clearly not the experience of South Wales. The 1880's were marked by a fluctuating but definite rise in house-building activity. This, however, was only a prelude to the major building boom of the 1890's that led the national boom by half a decade. The major trough in the regional index, centered between the peak years of 1897 and 1903, corresponded to a minor dip in what otherwise were years of extraordinarily high national building activity. The steady decline in Weber's index from 1903 is not paralleled in South Wales until after 1910. A slight two-year decline after 1903 is followed by an uninterrupted rise in the regional index for the next five years.

The available evidence points to significant differences in the course of house-building in South Wales and other parts of Great Britain. We will now look in some detail at the extant information on growth and fluctuations, both industrial and demographic, in South Wales in an attempt to relate the long swings in residential construction not
only to the regional path of industrial growth, but also to the pattern of development in the whole of Great Britain and the "Atlantic economy" as described in Chapter III.

HOUSEBUILDING AND THE ECONOMIC DEVELOPMENT OF SOUTH WALES

There are no available statistics on income and investment in Wales for the period under review. But the output of crude steel from 1879 and the volume of coal exports from South Wales ports from 1860 provide relatively good indices of industrial growth. There also exists a continuous series of the average price of steam coal valued f.o.b. Cardiff that may be considered a reasonable approximation to fluctuations in income.

The industrial progress of South Wales may be traced in Figure 5 where we have also reproduced the primary indicators of long swings in the "Atlantic economy". The pattern of development is by now a familiar one. Fluctuations in house-building and railway construction in the United States were highly correlated with British foreign investment and merchandise exports. During the expansion phase of the long cycle, where there was extensive investment in capital equipment in North America, the export
INDICES OF LONG SWINGS IN WALES AND THE "ATLANTIC ECONOMY", 1860-1914

(A) Miles of Railway track added in the United States, 1860-1913.

(B) Index of total new building in the United States, 1860-1914.

(C) Index of U.K. capital exports (1865=100) 1866-1912.

(D) Volume of total exports from the United Kingdom 1860-1913. (Original data as percentage of trend).

(E) South Wales Coal Exports, 1860-1913.
Source: Finlay Gibson, The Coalmining Industries of the United Kingdom, (Cardiff, 1921), p. 84.

(F) South Wales Crude Steel output 1879-1913.

(G) Occupied immigrants to the United States from Wales, 1875-1914.
Source: Brinley Thomas, Migration and Economic Growth, p. 272.
sector in Great Britain experienced a boom in economic activity. The pattern of industrial fluctuations in South Wales is in general agreement with the behavior of the British export sector. There were, however, periods, the early seventies for example, when the series moved inversely. The primary reason for the fall in coal exports relative to trend is found in the strain on industrial relations that coincided with the major boom in this period. The rapid development of the regional economy created severe stresses that ultimately became prime sources of dispute. Among these were the efforts of the colliery owners to crush the first general trade union movement in the coalfield and also their attempts to lower the wage rates they paid to the level of those paid by the ironmasters, who were becoming powerful competitors in the coal market, to their colliers. These various circumstances ultimately exploded in the large scale industrial stoppages of twelve weeks in 1871, three months in 1873, and five months in 1875.4

The industrial development of South Wales during the period from around 1860 to the outbreak of the First World

War is dominated by one imposing factor, the expansion of the coal industry. For the British trade sector as a whole, coal became the single most important commodity export in the last half of the Nineteenth Century. The increase in coal production in the middle of the century was primarily in response to the growing needs of an expanding domestic iron industry. But as Victorian England matured, the most important influences conditioning the development of the coal industry assumed international dimensions. The application of steam power in industry, in rail and ocean transportation around the world created an insatiable demand for coal. In a comprehensive study of the growth and direction of the British coal trade, D.A. Thomas states:

"Between 1850 and 1900, while the quantity of coal produced in the United Kingdom and retained for home consumption has rather more than trebled, or, per capita, a little more than doubled, the export, including coal shipped for the use of steamers engaged in the foreign trade, has grown fifteen fold, and increased from a proportion of 6.8 percent to one of 26 per-cent of the total output. In value it progressed from about 2 per-cent of the total of exports in 1850 to over 16 per-cent in 1900."

TABLE III

GROWTH OF PRODUCTION AND EXPORT OF COAL
UNITED KINGDOM 1860-1900

<table>
<thead>
<tr>
<th>Year</th>
<th>U.K. coal production (Millions of tons)</th>
<th>Export of coal, coke and bunker (Millions of tons)</th>
<th>%age of exports to prod.</th>
<th>Value of all Exports (Millions of pounds)</th>
<th>Value of coal Exports (Millions of pounds)</th>
<th>%age of coal value to total export value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>80.0</td>
<td>8.4</td>
<td>10.5</td>
<td>135.8</td>
<td>3.7</td>
<td>2.7</td>
</tr>
<tr>
<td>1870</td>
<td>110.4</td>
<td>14.1</td>
<td>12.8</td>
<td>199.6</td>
<td>6.7</td>
<td>3.4</td>
</tr>
<tr>
<td>1880</td>
<td>147.0</td>
<td>23.9</td>
<td>16.3</td>
<td>223.0</td>
<td>10.8</td>
<td>4.8</td>
</tr>
<tr>
<td>1890</td>
<td>181.6</td>
<td>38.7</td>
<td>21.3</td>
<td>263.6</td>
<td>23.9</td>
<td>9.0</td>
</tr>
<tr>
<td>1900</td>
<td>225.2</td>
<td>58.4</td>
<td>25.9</td>
<td>291.2</td>
<td>48.3</td>
<td>16.6</td>
</tr>
</tbody>
</table>

Table III shows clearly the growing contribution coal made to the total volume of U.K. exports.

It is evident that over the entire period, not only the volume of coal exports rose steadily, but also the proportion of coal exports to total coal production. The rapid development of this export based industry is an important, yet often overlooked factor explaining why total exports of the United Kingdom increased at all in the last quarter of the century.

South Wales played a major role in the expansion of the coal mining industry. In 1860, this region produced 10 million tons of coal, which was 12.8 per cent of the total output of the country; by 1913 this had increased to 56 million tons which then constituted almost 20 percent of total national output. This increase both in volume and in share is significant but fails to disclose the growing importance of South Wales coal production in supplying an expanding world market. The following table shows that by 1880, this region was the chief coal-exporting district in the United Kingdom. In 1860 the North-east coast exported

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## TABLE IV

PROPORTION OF TOTAL COAL EXPORTS FROM PRINCIPLE DISTRICTS OF THE UNITED KINGDOM 1860-1900

<table>
<thead>
<tr>
<th>Year</th>
<th>South Wales Bristol Channel</th>
<th>North West</th>
<th>North East</th>
<th>Humber</th>
<th>Other Ports on East Coast</th>
<th>East Scotland</th>
<th>West Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>24.4</td>
<td>8.6</td>
<td>53.5</td>
<td>3.4</td>
<td>.9</td>
<td>5.8</td>
<td>3.4</td>
</tr>
<tr>
<td>1870</td>
<td>31.2</td>
<td>4.9</td>
<td>46.9</td>
<td>4.5</td>
<td>.4</td>
<td>7.5</td>
<td>4.6</td>
</tr>
<tr>
<td>1880</td>
<td>39.0</td>
<td>3.4</td>
<td>39.5</td>
<td>6.7</td>
<td>.6</td>
<td>7.8</td>
<td>3.0</td>
</tr>
<tr>
<td>1890</td>
<td>43.6</td>
<td>2.1</td>
<td>31.1</td>
<td>7.7</td>
<td>.5</td>
<td>11.4</td>
<td>3.6</td>
</tr>
<tr>
<td>1900</td>
<td>41.9</td>
<td>1.6</td>
<td>29.7</td>
<td>9.5</td>
<td>.6</td>
<td>13.1</td>
<td>3.6</td>
</tr>
</tbody>
</table>

53.5 per cent of the total amount of coal shipped from the U.K., and the South Wales ports 24.4 per cent. By 1881, the Bristol channel had gained a greater percentage than the north-east, increasing their lead progressively thereafter. Cardiff became the most important coal-exporting port in the world.

The revolution in shipping that took place in the eighteen-sixties and seventies was a particularly favorable development for the coal mining industry of South Wales. The amount of sail tonnage constructed in 1860 was almost twice the amount of steam tonnage. Ten years later, in 1870, the steam tonnage added to Lloyd's Register was three times the sail tonnage. The following table gives some indication of the growing importance of steam technology in overseas shipping. Certain Welsh coals by being virtually smokeless were highly suited for steamships. This was early recognized by the Cunard, Peninsular, and Oriental shipping companies, and by 1872 the official position of H.M. Navy was to favor South Wales over "North country" coal.

Within easy reach of the sea, the Welsh coalfields were ideally situated to develop a brisk export trade. The

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<table>
<thead>
<tr>
<th>Year</th>
<th>Sailing</th>
<th>Steam</th>
<th>Total</th>
<th>Sail as % Total</th>
<th>Steam as % Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1860</td>
<td>9,624</td>
<td>2,549</td>
<td>12,173</td>
<td>79</td>
<td>21</td>
</tr>
<tr>
<td>1870</td>
<td>10,678</td>
<td>7,435</td>
<td>18,113</td>
<td>59</td>
<td>41</td>
</tr>
<tr>
<td>1880</td>
<td>10,765</td>
<td>18,310</td>
<td>29,075</td>
<td>37</td>
<td>63</td>
</tr>
<tr>
<td>1890</td>
<td>6,231</td>
<td>30,605</td>
<td>36,836</td>
<td>17</td>
<td>83</td>
</tr>
<tr>
<td>1900</td>
<td>4,054</td>
<td>45,168</td>
<td>49,222</td>
<td>8</td>
<td>92</td>
</tr>
</tbody>
</table>

heavy investment in railroads prior to 1860 and the subsequent provision and expansion of port facilities at Cardiff, Penarth, Newport, Swansea, Llanelly, and most impressively Barry later in the century, were all justified by the growing volume of trade in which the entire coalfield came to participate. In the latter part of the century, however, "it was the steam coals of the Rhondda which were sent in growing quantities all over the world."\(^9\)

The expanding export trade and the accession of steam transportation was by far the most important but not the only source of effective demand for the coal output of South Wales. "In 1875, over two-thirds of the United Kingdom's tin-plate works, and half of their copper smelting plants, were in this region, and consumed the coal that was mined locally ... "\(^{10}\) These industries, however, were largely export oriented. The available evidence leads us to conclude that the South Wales industrial sector was more dependent on foreign demand than any source associated primarily with the domestic market, and that in the course of the last half of the Nineteenth century

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\(^9\) Rees, *Studies in Welsh History*, p. XX

\(^{10}\) Lewis, *Building Cycles and Britain's Growth*, p. 113.
there was an extension and strengthening of the trade linkages between this region and the Atlantic and World economies.

The early 1870's witnessed a boom in British foreign investment and exports that was closely related to the construction and railway booms overseas. We have already observed that the widespread transition to a steam technology gave rise to a dramatic increase in the demand for iron and coal. The shortages occasioned by the Franco-Prussian war were not insignificant in adding to this demand by Continental powers. The iron industry alone used one third of the nation's coal output in 1869.\(^{11}\) Two and one-half tons were required to produce one ton of pig-iron. And though this requirement was progressively reduced through the development of improved production techniques,\(^{12}\) the iron industry experienced frequent shortages.

The coal industry was characterized by a long gestation period of investment. In the short run there were numerous obstacles preventing the full adjustment of coal supplies to meet changes in demand. There were limits to which supply could be expanded by working overtime and opening out new working

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places. When these limits were reached, further increases in supply could only be attained by sinking new mines, and depending on how deep it was necessary to go, this could take several years. 13 This basic characteristic of investment in the coal industry is perhaps the most important factor in explaining the coal price adjustment mechanism. "Fluctuations in demand were reflected in price changes in the short run, and in supply changes in a long run so long that the annual figures (of coal output) are almost free of any semblance of a cycle." 14 As rising demand drove up prices and, initially, profits in the face of inelastic supply, the volume of investment in coalmining increased. The following table shows the course of investment as measured by the formation of limited coal mining companies in South Wales. A coal price series is also included for the purpose of comparison.

Contemporary reports refer frequently to the large profits associated with high prices and their tendency to encourage widespread investment. In 1853, for example, H. Mackworth, a mines inspector, noted "the extraordinary and

14 Lewis, Building Cycles and Britain's Growth, p. 110.
TABLE VI

LIMITED COMPANIES (COAL MINING) REGISTERED IN SOUTH WALES AND THE AVERAGE SELLING PRICE PER TON OF STEAM COAL F.O.B. CARDIFF (1860-1875)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Nominal Capital</th>
<th>Number of Companies</th>
<th>Steam coal Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s.</td>
<td>d.</td>
<td>s.</td>
</tr>
<tr>
<td>1860</td>
<td>62,500</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>1861</td>
<td>213,000</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>1862</td>
<td>147,100</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>1863</td>
<td>330,000</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>1864</td>
<td>948,000</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>1865</td>
<td>770,500</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>1866</td>
<td>310,000</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>1867</td>
<td>131,000</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>1868</td>
<td>136,000</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>1869</td>
<td>70,000</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>1870</td>
<td>105,000</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>1871</td>
<td>275,000</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>1872</td>
<td>1,057,300</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>1873</td>
<td>3,185,000</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>1874</td>
<td>2,210,000</td>
<td>27</td>
<td>16</td>
</tr>
<tr>
<td>1875</td>
<td>551,000</td>
<td>9</td>
<td>14</td>
</tr>
</tbody>
</table>

sudden activity infused by high prices, and excessive demand, into the coal trade", of South Wales and a year later drew attention to "the large number of new shafts and new collieries being opened within my district."\(^{15}\)

Similar reports were submitted by mines inspectors in the mid-1860's and again in the boom years of 1872-74 when an unprecedented upsurge in activity led to a dramatic increase in productive capacity (as indicated by Table VI).\(^{16}\) The investment decisions of many colliery owners, however, were governed more by the long-term upward trend in demand than short term fluctuations and thus lent some degree of stability to the growth of this capacity. Indeed, these decisions were not simply made with the aim of maximizing profits in the short or medium-run, but also to maintain or increase ones share of what was clearly an expanding market in the long run.

"Nevertheless, this growth in productive power, at times steady and at times suddenly accelerated, produced periods of low prices and poor profits which lasted until the excess capacity was more than absorbed by the persistent upward trend in demand."\(^{17}\)


\(^{16}\) The growth of investment in response to an unprecedented increase in the demand for steam coal was given full attention in the Mines Inspectors Reports for 1874 and 1875.

\(^{17}\) Morris and Williams, *The South Wales Industry*, p. 80.
This we will see subsequently is of key importance in understanding the pattern of fluctuations in the course of house-building in the South Wales coalfield.

Expansion of the coal mining industry meant an increase in the derived demand for labour as well as capital. The inability of the existing population to meet the growing demand by natural increases was reflected not only in generally high wage rates, but also in significant waves of in-migration. This latter aspect of the industrial development of South Wales has been very ably analyzed by T.M. Hodges and Brinley Thomas.

Professor Thomas concludes:

"Three considerable waves of migration are clearly distinguishable, and they synchronized with the periodical cycles of prosperity in the mining industry ... [These fluctuations], enhanced in South Wales by the unsurpassed quality of the commodity, were so extensive that the miners earnings' could easily reach a point at which they were distinctly superior to those of other Trades: hence the incursion of such a large body of long distance migrants."  

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The system of wage determination in the coal mining industry of South Wales may have had a considerable influence on the extent to which labour was attracted to the coal fields not only from Welsh rural areas, but also from distant counties in England. The level of wages in South Wales, in spite of differences from valley to valley, was higher on the average than in any other British coalfield. An important reason for this is the geographical position of South Wales which makes it more isolated from centers of population than any of the English coalfields.

As new collieries were developed and sparsely populated valleys brought into production it became increasingly necessary to offer higher wages in order to attract the necessary labour. Other reasons for the generally high level of earnings were undoubtedly the strength of the South Wales Miners Federation and "the relatively high price of the coal which its superior qualities command in the worlds markets. These high prices have made the trade remunerative and have enabled colliery proprietors to open new mines, even though this could be done only by paying high wages."  

21 Jevons, The British Coal Trade, p. 121.
These factors, combined with major labour disputes in the early 1870's led to the adoption in May of 1875 of the first "sliding scale" wage agreement. Although this agreement applied only to the determination of wages of those colliers employed by members of the Coalowner's Association, it had a strong influence on the wage policy of non-member coalowners. The agreement introduced a minimum wage rate that "was to be 5 per cent higher than the rate paid at the respective collieries in 1869 to compensate the increased cost of living since that date," and tied the percentage change in wages above the minimum to the price of coal (7.5 per cent for each complete shilling change in price). The functioning of the "sliding scale" revealed advantages to both labour and employer; it enabled South Wales to avoid the adverse effects of the coal dispute of 1893 that had such a far-reaching impact on the other coal mining regions of the United Kingdom. The importance of this

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23 Ibid, p. 166; There was a ceiling imposed on wages, associated with prices of 21s. for steam and 20 s. for bituminous coal. If prices rose above these levels, wages would remain unchanged. This provision was a concession to the coal owners to compensate for the minimum wage-rate.

institutional solution to the problem of wage determination for our purposes is found in its influence on the movement of labour into the South Wales coalfield and the consequent increase in required housing accommodations.

The relationship between changes in wage rates and changes in the numbers employed in the coal mining industry has been studied by R.H. Hooker who concluded that changes in the level of employment responded primarily to upward movements in wages, while falling wages rarely led to substantial migration of miners out of the region. The men became conditioned by the recurring cycle of prices to regard a period of low earnings to be followed "in the nature of things" by a period of prosperity. In drawing his conclusions, Hooker placed great emphasis on the pervasive influence of the sliding scale. Because this innovation superseded the forces of supply and demand in the labour market, employers were precluded from lowering wage rates when there was a large number of people seeking employment, unless of course, the price of coal fell.

"The average migrant, if not impelled by force of circumstances, would be persuaded to try his luck by the information

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reaching him regarding money wages in the coalfield ... It is, therefore, conceivable that the rate of wages in the pits in a given year would prove high enough to attract distant outsiders, even though at that particular time there was already a general over-supply of workers. And even this enhanced surplus would not necessarily lower the wage percentage ... "

There can be little question that the high wages resulting from the industrial prosperity of South Wales were a powerful magnet drawing labour incessantly from throughout the United Kingdom. The inexorable growth of the numbers employed in the coalfields of South Wales can be traced in Figure 6. This general trend was reflected in an ever growing demand for housing accommodations.

Throughout the period 1860 to 1914, there existed a shortage of housing accommodations in all of the mining valleys of the region. Overcrowding and part-letting of available house space was very common. Indeed, one reason given for the high wages in the South Wales coalfield was the fact that colliery companies rarely provided for the housing of their workers. In Northern England, the colliery owners built houses with their

26 Thomas, "Migration of Labour into the Glamorganshire Coalfield, 1861-1911", p. 291.
INDICES OF HOUSE-BUILDING AND THE GROWTH OF INDUSTRY
AND TRADE IN SOUTH WALES

(A) Average annual price of coal (F.O.B. Cardiff), 1860-1914. Mean of 1886-91 = 100.
Source: Finlay Gibson, The Coal Mining Industries of the United Kingdom, (Cardiff, 1921), p. 84.

(B) Index of house-building in South Wales, 1860-1914.

(C) Numbers employed in the coal mines of South Wales, 1864-1914, (in thousands).

(D) Output of Coal in the coalfields of South Wales, 1862-1913, (In 000,000's of tons).

(E) Coal exports from the Bristol Channel, 1860-1902, (in 000,000's of tons).

(F) Mean annual wage of Colliers, percentage of 1879 standard, 1880-1911.
own funds and then rented them to the miners. In the South of Wales, only a few employers in the valleys of Monmouthshire found it to their advantage to provide the miners with cottages and shops, but this practice soon died out and house-building was left largely to private builders and societies.

The increase in numbers of masons and carpenters returned in the decennial censuses as well as the increased volume of construction timber imports entering the main Bristol Channel ports are evidence of the growing productive capacity of the domestic construction industry. In 1861 there were 6,290 such craftsmen returned; by 1891 this had grown to 15,458. "Loads of timber and deals imported into Cardiff rose from 27,761 in 1861 to 65,000 in 1871, to 85,599 in 1881, and to 129,796 in 1891." But despite the increased volume of residential construction, (see the South Wales regional housebuilding index) house-building failed to keep pace with the requirements of a growing population. In the urban areas of South Wales alone, the number of inhabited houses in 1901 was 103,980, or 5.6 persons per house. By


1911 this had grown to 135,416 inhabited houses, or 6 persons per house. Further possible evidence of the growing gap between supply and demand is found in what little data there is available on part-let houses. In 1901, there were 11,722 such houses in the urban districts, which constituted 11.2 percent of the total number of inhabited houses. In 1911 the number was 16,724, or 12.3 per cent. The inexorable growth in demand resulting from the influx of labour into the coalfields of Glamorganshire and Monmouthshire between the years 1860 and 1914 is the single most important factor explaining the long term upward trend in the South Wales regional house-building index. This conclusion will be reinforced by our analysis of population movements in the next section.

We must now, however, briefly look at the structure of the housing sector and the nature of industrial investment in South Wales to explain the short term fluctuations about the long term trend in residential construction. We have seen that the industrial development of South Wales was constrained by shortages of both labour and capital. This perpetual scarcity of factors had a drastic impact on

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29 Ibid., p. 72

30 Ibid.
the domestic construction industry, for both industries, house-building and coal-mining, were located in the same areas and competed with one another, not only for labour and capital, but also for materials. A carpenter could just as easily construct mine facilities, shore and roof shafts as build houses. Constructional timber could be used for houses or to reinforce mine tunnels. The difference was that the strength of a growing international demand for coal enabled the colliery owners to pass the higher wages, material and capital costs on as increased prices. At a time when prices and profits as well as wages (because of the sliding scale) were rising in the coal industry, construction languished because of its inability to compete for factors. The house-builder in general, could not raise prices and rents to cover increased factor costs.

The demand for new houses was highly elastic, partly because of the range of alternatives open to the potential house-buyer. He could always choose to double up with another family, or instead of buying a new house nearer the colliery, he could get up a couple of hours earlier and walk to the mines. It was not uncommon for colliers to walk many miles, morning and night, to and from the pits. The sensitivity of housing demand thus placed relatively close limits on the extent to which the price of housing accommodations could be raised.
without seriously affecting the quantity demanded.

Earlier we noted the relationship between the investment boom in the early 1870's and the lagged boom in residential construction. We will now propose a tentative generalization of that argument for the entire period under discussion. This requires an index of investment in the coal mining industry, which unfortunately does not exist. There is extant, however, a series of coal export prices (F.O.B. Cardiff) which may be considered a reasonably good index of profitability for the industry. This assumption rests on an argument presented earlier in this section which, in essence, held that in the face of inelastic supply conditions in the short run, increases in demand would be translated into a rise in prices and profits. The introduction of the sliding scale does not seriously affect this assumption because the functioning of the scale was such that wage adjustments lagged price changes by at least six months.

The coal price series (our index of profits in the coal-mining industry) is presented in Figure 6 along with the

31 The series of limited coal mining companies registered in South Wales presented above on page 133 does not extend beyond 1875. Even if it did, however, there are numerous legitimate objections which would render it inappropriate as an index of new investment after 1880, for our purposes here.
South Wales regional house-building index. Keeping in mind the fact that the former is only a rough indication of the level of investment in coal mining, and the extent to which that industry was drawing on available resources, there does appear to be a significant inverse relationship between the two curves. Coal prices (and profits) tended to move with the regional index in the initial stages of an upswing in building, witness 1869-73, 1888-91, and 1900-01, but only after prices and profits in coal mining began to fall, did these building booms really get under way.

There were, of course, factors exerting independent influences on the volume of investment in coal mining and house-building. For example, the decline in house-building after 1885 during a period when profits and investment in coal mining were depressed is largely attributable to the frequent construction stoppages associated with the wave of new unionism that swept through South Wales, especially after 1888.\(^{32}\) Despite such minor variations, the major fluctuations in these indices convey the overwhelming impression that the two industries did react on one another in some systematic way.

In the opinion of the present writer, the available evidence appears to support the hypothesis that the residential construction sector of the economy of South Wales was a residual benefactor of the growth and prosperity of the domestic coal mining industry. When coal prices and profits fell investment in residential construction became more attractive. Not only was there a diversion of financial capital into the mortgage market, but the accumulated savings resulting from increased incomes during the industrial boom could now be used to provide the colliers family with their desired housing accommodations under more favorable conditions. The easing of credit conditions in the mortgage market, though significant, is perhaps not as important as it at first appears. The rate of return on investment in coal mining was perpetually higher than the rate paid out of house rents received at customary levels. Thus, even when there were changes in the relative rates of return that favored house-building, the increased availability of mortgage capital was insufficient to meet the prevailing demand.

By and large the colliers of South Wales, in contrast to those of Northern England, had to provide their own dwellings by forming building societies and clubs. They paid for their houses by monthly installments. It was not unusual,
therefore, for a collier to be paying about one pound a month in capital installments or subscription fees in addition to rent of 22s. to 28s. per month. ³³ This proved to be an effective means of mobilizing the savings of the community to provide housing for its members.

Changes in relative returns, then probably had a more favorable impact on house-building through the consequent easing of supply conditions in the input markets from which both industries drew. Any tendency to overproduction in the coal-mining industry that gave rise to an inventory downturn could release labour and materials for use in residential construction.

In summary, then, we have seen (referring to Figures 5 and 6) that the movements of South Wales coal exports and steel output relative to trend, as well as the fluctuations in house-building were inverse to those of home investment and house-building in Great Britain. The course of residential construction in South Wales was largely determined by the long run expansion of the coal mining industry, and by fluctuations in the export sector, which through the price-profit mechanism determined the industrial disposition and

utilization of productive resources.

DEMOGRAPHIC FACTORS AND THE COURSE OF HOUSE-BUILDING IN SOUTH WALES: FURTHER EVIDENCE OF THE ABSENCE OF REGIONAL LONG SWINGS IN RESIDENTIAL CONSTRUCTION

The last section was primarily concerned with the relationship between the industrial development of South Wales and the course of house-building in that region. There we briefly discussed the migration of labour into the coalfields and its importance in contributing to an already growing local demand for housing accommodations. We now turn to a more detailed analysis of migration, both external and internal, based on the researches of Thomas A. Welton, A.K. Cairncross, and Brinley Thomas as well as the details contained in the Census of Population. In Chapter III we drew attention to the waves of transatlantic migration which carried a part of the natural increase of most European countries

34 Thomas A. Welton, "Note on Urban and Rural Variations According to the English Census of 1911", Journal of the Royal Statistical Society, Vol. LXXVI, (February, 1913), pp. 304-317; see also by the same author, England's Recent Progress: An Investigation of the Statistics of Migration, Mortality, etc., in the Twenty Years from 1881 to 1901, as indicating Tendencies towards the Growth or Decay of Particular Communities and of the Rural Portions of England and Wales, (London: Chapman & Hall, Ltd., 1911).


overseas primarily to the Americas, but also to Asia, Africa, and Australia. The time-shape and amplitude of the losses for South Wales provide us with further evidence on the growth and fluctuations of the regional economy.

The net migration rates for England, Scotland, and Wales will be found in Table VII. The decennial estimates of net gain or loss are determined by subtracting the excess of births over deaths from the increase in enumerated population between the censuses. When the excess of births over deaths exceeds the recorded increase in population, there was a net loss through out-migration. If, on the other hand, the natural increase was less than the recorded population change, there was a net gain through in-migration.

It is clear from Figure 7 that the pattern of migration for Wales differed significantly from those of both England and Scotland. The rate of loss declined in all three countries in the 1860's and early 1870's, but their divergent paths in the 1880's provide a striking contrast. The boom in overseas investment was accompanied by a long wave in trans-Atlantic migration to which England and Scotland contributed substantially. The outflow from Wales, on
<table>
<thead>
<tr>
<th>Year</th>
<th>England</th>
<th>Wales</th>
<th>Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>1861-71</td>
<td>-7</td>
<td>-47</td>
<td>-44</td>
</tr>
<tr>
<td>1871-81</td>
<td>-5</td>
<td>-35</td>
<td>-28</td>
</tr>
<tr>
<td>1881-91</td>
<td>-23</td>
<td>-11</td>
<td>-58</td>
</tr>
<tr>
<td>1891-1901</td>
<td>-2</td>
<td>-5</td>
<td>-13</td>
</tr>
<tr>
<td>1901-11</td>
<td>-19</td>
<td>+45</td>
<td>-57</td>
</tr>
</tbody>
</table>


*Note:* The net migration figures are expressed as a rate per 10,000 of the mean decennial population to allow comparison of the course of migration for each country.
DECENNIAL NET GAIN OR LOSS THROUGH MIGRATION: ENGLAND, WALES AND SCOTLAND 1861-1911

Source: See Table VII
the other hand, which continued to fall over the entire decade, was negligible. The differences in the demographic experiences of these countries become even more pronounced in the first decade of the Twentieth century. Again, there were long waves in overseas expansion and European emigration, with the English and Scottish hinterland contributing its surplus population to the peopling of the developing countries. But the experience of Wales was unique in that she joined the ranks of the immigrant countries, receiving people at an annual rate of 45 per 10,000 population.

We now turn to a more detailed look at the internal migration balance for Wales, concentrating primarily on demographic changes in the South Wales coalfield. The following table shows the pattern of net regional change by migration in Wales for decennial periods from 1861 to 1911.

Using the net rate of regional migration as an index of industrial expansion, it is evident from Table VIII that the industrial sector of Wales (i.e.,) Glamorgan-Monmouthshire region) experienced high rates of economic activity in those decades (1881-91, 1901-11) when the industrial sectors of England and Scotland were relatively depressed. The 1860's and 1870's witnessed a steady outflow of population from the
## TABLE VIII

### INTERNAL MIGRATION BALANCE: WALES
decennially, 1861-1911

<table>
<thead>
<tr>
<th>Areas</th>
<th>1861-71</th>
<th>1871-81</th>
<th>1881-91</th>
<th>1891-1901</th>
<th>1901-1911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welsh rural areas</td>
<td>-58,967</td>
<td>-64,646</td>
<td>-106,087</td>
<td>-57,413</td>
<td>-37,909</td>
</tr>
<tr>
<td>Glamorgan-Monmouthshire Colliery area</td>
<td>+11,033</td>
<td>+12,213</td>
<td>+87,225</td>
<td>+40,326</td>
<td>+129,295</td>
</tr>
<tr>
<td>Wrexham Colliery area</td>
<td>-1,984</td>
<td>-1,907</td>
<td>-1,122</td>
<td>-618</td>
<td>-2,875</td>
</tr>
<tr>
<td>Llandudno and Rhyl areas</td>
<td>-2,268</td>
<td>+2,339</td>
<td>+2,190</td>
<td>+8,289</td>
<td>+5,715</td>
</tr>
<tr>
<td>Wales</td>
<td>-63,005</td>
<td>-52,139</td>
<td>-17,794</td>
<td>-9,350</td>
<td>-98,492</td>
</tr>
</tbody>
</table>

countryside in Wales. A number of new forces were beginning to have an influence on the regional economy and one consequence of this was a marked increase in the mobility of rural inhabitants. The Elementary Education Act of 1870 had a disruptive impact on the agricultural labourer's standard of living. The reduction in family earnings occasioned by the restriction of child labour tended to make it more likely for the agricultural labourer to migrate. In an attempt to strengthen the agricultural labourers bargaining position, the Labourer's Union adopted a policy of providing financial assistance to those rural workers who wished to move to the mining and manufacturing centers. The disturbing influence of factors such as these helps explain the growing rural exodus that took place while agriculture was still a prosperous and productive enterprise. We raise this issue primarily to point out that there were forces operating in the rural economy to expell a growing surplus population, and that the lure of higher wages in the coalfields as well as overseas were not the only operative factors leading to a regional and sectoral redistribution of the world's population. Indeed, the comparatively slow growth of the industrial sector of South Wales

in these two decades allowed only 23,246 or approximately 18 per cent of the rural outflow of 123,613 persons to be absorbed in the colliery districts of Glamorganshire and Monmouthshire.

There was a sharp rise in the net outflow from the rural districts in the 1880's which was in part a response to the agricultural depression that set in after 1879. The rapid growth of the South Wales coal industry enabled this region to absorb 82 percent of the rural residues. (We are, of course, and have been speaking figuratively: of the 87,225 gained through migration, many came from distant counties in England, Scotland and Ireland; what we are here trying to establish is the tremendous absorptive power of the South Wales regional economy.)

"in this decade [1880-1889] when emigration from England was very heavy, emigration from Wales was negligible. During the nineties, when England was having a home-investment boom, the net absorptive capacity of industry in South Wales was less than half of what it had been in the previous decade. However, the spectacular growth of new towns such as Llandudno and Rhyl, and the striking fall in size of the rural surplus, enabled Wales to retain almost the whole of its natural increase.

At no time was the contrast more evident than in the decade 1901-11 when a net Welsh rural exodus of 38,000 was matched by a net absorption of 129,000 in the Glamorgan-Monmouthshire coalfield ..."39

This final wave of migration into South Wales during this stage of her industrial development reflects not only the unparalleled growth of the coal industry, though this was by far the most important factor, but also the progress in education, transportation and communication which exposed more and more people to the advantages of town life.40 The persistence of agricultural depression was also important in limiting the employment opportunities in rural areas, thus providing a strong push element in the rural exodus.

The industrial and demographic experience of South Wales departed dramatically from that of England and Scotland after 1870. The divergent patterns are perhaps best summarized in Table IX and Figure 8. Table IX contains the net migration balances for the South Wales coalfield and English colliery regions from 1861 to 1911.

39 Thomas, The Welsh Economy, p. 16.

40 But, perhaps not so clearly the disadvantages. As Hooker ("On the Relation Between Wages and Numbers Employed ..."op. cit., p. 633) points out, "It is not as a rule until the man has had experience of the conditions of life in a new district that he appreciates the difference between real and money wages."
<table>
<thead>
<tr>
<th>Decade</th>
<th>South Wales&lt;sup&gt;a&lt;/sup&gt; Coalfield (000's)</th>
<th>English coal&lt;sup&gt;b&lt;/sup&gt; Regions (000's)</th>
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</thead>
<tbody>
<tr>
<td>1861-71</td>
<td>+ 11</td>
<td>+ 82</td>
</tr>
<tr>
<td>1871-81</td>
<td>+ 12</td>
<td>+ 74</td>
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<tr>
<td>1881-91</td>
<td>+ 87</td>
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<tr>
<td>1891-1901</td>
<td>+ 40</td>
<td>+ 45</td>
</tr>
<tr>
<td>1901-11</td>
<td>+ 129</td>
<td>- 12</td>
</tr>
</tbody>
</table>

Source: a) Table VII  

DECENNIAL TRENDS IN HOUSEBUILDING AND MIGRATION:
SOUTH WALES, ENGLAND AND SCOTLAND 1861-1911

Source: (A) and (B) Table VIII
(C) Table XVI, Appendix I
(D) and (E) Table VI
It is readily apparent from Figure 8 that the demographic movements of South Wales were inverse to those of the English colliery regions as well as England and Scotland in the aggregate. When there was an upswing in the South Wales regional economy, the British export sector was simultaneously expanding, while capital construction, notably housebuilding, at home was depressed (i.e., 1880's and 1900's). The coal output of English colliery regions, in contrast to South Wales production, was consumed primarily on the home market and thus fluctuated in agreement with the long swings in the rate of domestic capital formation. The rapid growth of the South Wales coalfields allowed the regional economy to absorb a large percentage of the country's natural increase or even to attract a net inflow of labour from other countries, while the languishing home construction sector in England and Scotland led to a substantial increase in the percentage of the surplus rural population emigrating overseas. Alternatively, when expansion in the South Wales coalfield and the British export sector were declining relative trend, British home investment, particularly housebuilding, was moving ahead rapidly. During these periods, the Welsh rural exodus slowed up or was partially diverted to England where a booming home construction sector was creating a growing demand for labour.
In Chapter III we drew attention to the fact that the demographic movements in England and Scotland (for our purposes here, the net rate of loss, or gain, through migration) were in complete agreement with the long swings in residential construction. The evidence on demographic changes in Wales that we have surveyed in this section, however, does not support the long swing hypothesis at the regional level. The rate of loss through migration for Wales traced in Figure 8 diverges sharply from that of her neighbors. Our analysis of the internal migration balance with particular emphasis on the experience of the coalfields in the south, points to a pronounced inverse relationship between the pattern of migration for South Wales and that for England and Scotland. We may conclude that any index of residential construction for Wales as a whole would follow closely the regional pattern for South Wales. This is justified by the fact that the regional economy so dominated the economic development of Wales. In any event, the available demographic evidence confirms the divergent course in housebuilding in South Wales.
VARIATIONS IN THE COURSE OF HOUSE-BUILDING AT THE LOCAL LEVEL: SOUTH WALES

We now turn to a closer examination of the various components of the South Wales regional index. This examination will concentrate on the house-building statistics for sixteen towns presented in Table I of Appendix II. For convenience, the raw data on house plans approved annually in each of these towns has been graphed in Figure 9. We must now proceed cautiously under the following caveat. The conclusions drawn from the following analysis must be considered tentative. I have been unable to acquire the relevant information (i.e., Town population changes resulting from boundary alterations, monthly subtotals of the annual number of plans approved, etc., all discussed in the Appendix) that is required to convert the series of house plans approved to estimates of actual houses built. The raw data series reproduced in Figure 9 are only presented as rough approximations to the actual course of house-building at the local level.

Admittedly, the statistical problems associated with the method of analysis used in the present paper do cast dark shadows over the conclusions subsequently drawn. This to some extent cannot be avoided. Confidence in our results,
however, is reinforced by conclusions drawn from earlier studies of building cycles in the United States. It will be recalled that Riggleman, in a study cited earlier in Chapter Two, found that "... it is quite probable that few industries have a better index of activity over a long period of time than the building industry has in building permits."\(^1\) The problems of comparability associated with municipal boundary changes may be more apparent than real. C.D. Long, in an intensive study of building cycles and investment found that "... examination of effects of more than fifty annexations in over a dozen cities produced no evidence that boundary changes seriously impair uniformity of building permits data."\(^2\)

The problems associated with the gestation period of construction and the lag between plan approval and actual construction is not so easily surmounted. Riggleman was able to argue that "while this point must be kept in mind when interpreting permit data, the lag is not as important when dealing with annual data as with monthly data, since most of

\(^{1}\)Riggleman, "Building Cycles in the United States", p. 54.

the permits issued in a given year cover construction completed within that year.\textsuperscript{43} The evidence that is available, however, appears to indicate that the construction period for comparable dwelling units was somewhat longer in Great Britain than in the United States. This fact along with what little information there is available on the monthly distribution of plan approvals gives us reason to believe that the time lag structure appropriate to the United States was somewhat shorter than that in Great Britain.\textsuperscript{44} Consequently, the adoption of Riggleman's argument would be invalid for the convenience of the following analysis. The problems raised by this issue are not so easily dismissed. The following examination is only undertaken with due consideration of the limitations and qualifications of the data.

Throughout this analysis, the local data will be kept in their raw form. There are several reasons why no smoothing techniques have been applied. First, the use of annual data constitutes in itself a smoothing-out of the smaller fluctuations that occur during the year. Second, application of the method of moving averages would have allowed random movements to

\textsuperscript{43}Riggleman, "Building Cycles in the United States", p. 54.

\textsuperscript{44}J. Parry Lewis, Building Cycles and Britain's Growth, p. 302.
influence the peaks and troughs. Thus, turning points would often diverge from the years in which they actually took place. By keeping to the raw data, it is in part possible to disregard as turning points, yet fully appreciate the impact of random movements, social, and natural upheavals. A third problems is that minor fluctuations at the local level are highly irregular in timing and amplitude. This makes the choice of a period for a moving average arbitrary and dangerous.

The following will of necessity be a very superficial treatment of a problem that requires far more intensive study. The dearth of information in North America on the demographic and economic history at the local level in South Wales renders our task primarily one of identifying and isolating the most salient characteristics in the local patterns of house-building activity. Hopefully, in light of our discussion in Chapter IV, we will be able to say something meaningful about the relationship between the course of house-building at the local level and the behavior of the South Wales regional and Weber's national indices of residential construction.

A closer look at the house-building curves reproduced in Figure 9 leads to the following observations:
Figure 9

INDICES OF HOUSE-BUILDING FOR SIXTEEN TOWNS
IN SOUTH WALES
1860-1914

Source: Table XVII, Appendix II
Newport

Aberdare

Merthyr Tydfil

1860 1870 1880 1890 1900 1910
A. There was a wide range of variation in the course of house-building at the local level.

B. The general pattern of residential construction as manifested in the regional index is reflected in only two of the sixteen towns studied.

C. Violent short run fluctuations in the local series are lost in the method of aggregation which results in a significantly smoothed regional building curve (index).

D. A long swing in residential construction can be distinguished in only five of the local series.

In the years 1860-69 house-building in South Wales was at a very low level. This was in part a consequence of the over-supply of housing accommodations resulting from the speculative building boom in the late 1850's. The moderate amount of migration in this decade, compared with later decades, as well as the depressed state of the local economy, especially after 1866, were important factors contributing to a reduction in effective demand for dwellings. There were, however, significant, if only minor, upswings in building activity in the towns of Swansea (1863-67) and Aberdare (1863-66), which were reflected in a minor fluctuation in the South Wales
regional index, centered on 1867. From 1868 to 1872 depression in the construction industry prevailed in most of the towns for which we have data, except perhaps, Cardiff and Llanelly M.B.

The decade of the 'seventies witnessed an unprecedented increase in residential construction throughout South Wales. For each of the series presented in Figure 9, which extends back through this decade, a significant boom in house-building can be identified. The most spectacular increases occurred in Swansea where the number of house plans approved jumped from 213 in 1872 to 820 in 1875; and in Cardiff where the increase was from 251 in 1872 to 648 in 1875. In the previous section we discussed the role played by South Wales in the great construction and railway booms that got underway throughout the world around 1870. In attempting to meet the requirements of an expanding world market for coal, iron, copper and tinplate, both Swansea and Cardiff, as the major ports on the Bristol Channel, found their docks, storage and loading facilities taxed to capacity. Each of these towns, as a major nexus between the hinterland and the markets overseas became a focal point for investment in heavy industry and social overhead capital. Transportation systems were extended and the ports burgeoned with activity.
Decennial increases in town population provide a reasonably good indication of the relative intensities of economic activity at the local level. In 1861 the population of Swansea was 41,000, by 1871 this had grown to 52,000, an increase of 25 per cent. The moderate growth of the 1860's was followed by a wave of in-migration over the next ten years. Attracting newcomers not only from Welsh rural areas but also from distant counties such as Cornwall, Devon, Gloucester and Somerset in England, the town population swelled to 76,000 by 1881, the net decennial increase being over twice that in the previous decade. Cardiff experienced a similar demographic increase, her population rising gradually from 33,000 in 1861 to 40,000 in 1871, and then exploding to 83,000 by 1881. Approximately 17,000 of the 43,000 decennial increase is attributable to changes in municipal boundaries. It should be kept in mind, however, that of the 17,000 persons added by boundary changes, a substantial percentage were also newly relocated migrants from the hinterland and distant counties.

The upswing in building activity during the 1870's manifested in the local house-building series for various towns in South Wales is in general agreement with the course of house-building represented in both the South Wales regional index and Weber's index of residential construction in Great Britain. This similarity lends credence to the hypothesis that long swings in residential construction are the result of major economic and demographic forces, either nationally or internationally determined, which override local or regional conditions that might otherwise be unfavorable to increased building activity. It is difficult to accept or dismiss such a proposition without a more intensive study of local historical records. On the other hand, it is evident from Figure 9 that in the years following the boom of the 1870's there was a growing diversity in the course of house-building at the local level.

It might be useful to concentrate briefly on the different experiences of two prominent towns: Swansea and Cardiff. The industrial base of Swansea was far more balanced than that which developed in the East country; the latter concentrating almost entirely in the production of iron and mining of steam coal. The advantages of a coastal site and free access to coal
made Swansea ideally situated for the development of various metallurgical industries, which eventually came to be concentrated in this Western region. The Ynyscedwyn and Ystalyfera iron works, where the first successful use of anthracite in the smelting of iron had been achieved by George Crane in 1837, were located in the Swansea Valley. "By 1875, fifty-seven of the seventy-seven tinplate works in the United Kingdom were situated in South Wales, mainly on the coast near Port Talbot, Swansea, and Llanelly. Of lesser importance was the gravitation of a substantial portion of Britain's lead, zinc, and silver smelting industries towards the same area." Copper smelting was also a major industry situated in and around Swansea. In 1876, 54 per cent of the copper smelting capacity of the United Kingdom was concentrated in this area. The amount of coal consumed by these local industries was so great that the number of colliers employed in the mines was as high as the number of men occupied in the works. All of these industries participated in the investment boom and prosperity of the early 1870's only to find themselves far more vulnerable to the fluctuations in market

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conditions that were to follow. By 1876, both the copper and iron industries were well beyond their peaks. In the copper industry it was becoming more economical to smelt the copper ore near the mines. The boom in iron production in 1871 and 1872 created by the abnormal conditions of the Franco-Prussian War superimposed on the requirements of heavy investment projects in the Western hemisphere was a cyclical departure from a trend that was perceived to have been declining from the late 1860's.

There is every reason to believe that the course of house-building in Swansea was significantly influenced by the availability of credit as well as speculative builders expectations of greater profits fostered by abnormal industrial prosperity. Earlier we noted that wages and incomes had risen to extremely high levels in the early 1870's. The increased income available for expenditure on housing accomodation was supplemented by a growing volume of mortgage credit, primarily financed by Building societies. What little available evidence there is indicates that much of the credit extended was in violation of certain duties and restrictions imposed on societies incorporated under the Building Societies Act of 1874. The intended limit on borrowing was often ignored. In Cole v. Swansea Cooperative
Building Society it was stated that "The Society started in 1875 and immediately exceeded their borrowing powers, a position in which they have ever since continued (1885)." The St. Helens Building Societies of Swansea were also found to have violated their authorized borrowing limits by a rather large sum of £35,000. Easy money conditions certainly encouraged the boom in house-building. The precipitous fall in house-building activity in Swansea after 1875 was in part a lagged response to the sectoral readjustments occasioned by the industrial collapse of 1873. With the decline of the iron industry there was increased unemployment as well as reduced demand for coal in the West country, thus creating more unemployment in the coal fields around Swansea. But stagnation in the metallurgical industries after 1873 was not the only reason for the relative decline in the West. Expectations of greater progress were based largely on the belief that the steam raising qualities of anthracite would enable this West land staple to gain access to wide markets. The failure of attempts to find new, more productive uses for anthracite coal soon proved this belief to be in error.

48 E.J. Cleary, The Building Society Movement, (London: Elek Books Ltd., 1965) p. 120.
49 Ibid, p. 122
Though the more prosperous years came to an end for the metalurgical industries around Swansea with the onset of depression in 1873, the growth of the "sale-coal" industry was hardly affected for its progress was now primarily determined by the state of world demand for steam coal. This demand grew steadily with the applications of steam technology in industry and transportation around the world. The corresponding increase in coal production was distributed unevenly over the coalfield. The regions where mining activity developed most rapidly were the valleys of Rhondda and Aberdare. The smokeless steam coals mined in these valleys found their way to foreign markets through the ports of Cardiff and Newport. The growth of Cardiff as the most important port in the coal export trade (the total volume of coal shipments in 1874 was 3,780,000 tons as opposed to 768,000 tons for Swansea) of South Wales is in no small part due to the provision of rail transport facilities, especially the Taff Vale Railway, which helped determine the intensity as well as the extent of exploitation of the valleys. Another important factor contributing to the brisk trade at Cardiff was the expansion of dock accommodations to 97 1/2 acres by 1875. In that year, however, the coal reserves of the Rhondda valley were just beginning to be tapped. In the following decade
the opening up of new collieries and the extension of existing ones raised the annual production of the valley by 31/2 million tons.

The phenomenal growth of Cardiff is reflected in the house-building series presented in Figure 9. Its development after 1878 stands in marked contrast to that of Swansea. The sharp upswing in house-building between 1873 and 1875 was followed by a four-year pause in which the series fluctuates about a high 600 level. These were years in which house-building fell off dramatically in Swansea, Llanelly M.B., and Blaenavon. The trough in the regional index in 1879 coincides with extremely low levels of building activity in Swansea, Mountain Ash, Ebbw Vale, Blaenavon, Merthyr Tydfil, Aberdare and Newport. The decade of the 1880's, in which the construction industry in Great Britain (Weber's index) was severely depressed, opened with a dramatic increase in house-building in Cardiff and Penarth. The industry remained relatively depressed in Swansea until 1886 while Cardiff underwent a prolonged boom in house-building, interrupted only in the years 1888-92 by shortages of capital and work stoppages.

Further evidence on the dissimilar development of Swansea and Cardiff is found in the data on municipal population changes. In 1871, the population of Swansea was 52,000, by 1881 this had
grown to 76,000, by 1891 it was 91,000 and by 1901 it had increased to 95,000. The net decennial changes agree very well with the course of house-building. For example, the increase of 24,000 people in the 1880's coincided with an upswing in residential construction until 1890. But house-building fell sharply after 1895 to its lowest level in 1898-1900; in this decade the population increased by only 4,000. The population of Cardiff on the other hand rose from 40,000 in 1871, to 83,000 in 1881, 129,000 in 1891 and 164,000 in 1901. The building booms of the 1870's, 80's and 90's correspond closely to the large decennial increases of 43,000, 46,000 and 35,000 respectively in the urban population. 50

The period extending from the 1880's until the outbreak of war in 1914 witnesses the appearance and growth of many small towns throughout the regions of the coalfield. To some extent this is evidenced by the growing number of local records on house-building that become available in this period. 51

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51 The Health Act of 1848 required local health boards to be set up once a certain degree of urbanization had been reached. These boards were responsible for the enforcement of Building By-Laws and the maintenance of records on approved house plans.
outstanding characteristic of the industrialization of South Wales is the marked lack of uniformity by which the local development of broad sectors of the coalfield proceeded. This uneven growth was a result of the complex interaction of numerous geological, technical, personal, and economic factors. A complete explanation of this process lies beyond the scope of the present paper; however, the available evidence on the course of house-building at the local level in South Wales suggests that a more productive approach to the analysis of this industry could be undertaken by concentrating on the progress of development in and factors specific to the individual valleys throughout the entire region. If the South Wales regional index is to have any analytical value whatsoever, we must be able to relate it in some meaningful way to the operative forces conditioning the local pattern of development. The growing international demand for coal provided the impetus for regional development, but the extent and progress of that development can only be understood by fully appreciating the variety of factors we so often refer to as local conditions, and then dismiss from any analysis.

One important characteristic of the industrial development of South Wales was the growth of certain well-defined
urban areas in various parts of the hinterland. The topography of the coalfield played an important role in this process of urbanization. The existence of long, narrow valleys separated by interjacent mountain ranges largely determined the boundaries of these new urban districts.

For the purposes of local administration, the new urban areas were far more suitable, and soon replaced the old civil parishes, each of which had extended over several of the valleys. In what follows, we treat the valleys as individual entities. By so doing, we are able to trace the close relationship between development in the coal industry, the course of house-building at the local level, and population changes at the appropriate level of aggregation. Our population data are drawn primarily from Hodges for the following reason:

"Without a local knowledge, it is almost impossible to compute an accurate estimate of the population of these valleys from the Census figures, since the various parish populations given overlap into several valleys. Thus it is only by means of many cross-calculations coupled with local knowledge of the places mentioned that approximate valley totals can be computed."52

Early development of South Wales from around 1825 to 1860 was concentrated in Swansea, the immediate hinterland west of the Vale of Neath and the Merthyr and Aberdare valleys in the East. The major industries in this period were first iron and second coal production. The valleys of Merthyr and Aberdare were major iron producing regions that had achieved maturity by the 1860's; and with the decline of iron production after the early 1870's, the populations of these valleys remained relatively unchanged from 1860 to 1890.

The slight decline in population during the 1870's and early 1880's was in part a consequence of the rapid development of the Rhondda and the prevailing wage differentials between the valleys which attracted workers away from Merthyr Tydfil, Aberdare, Mountain Ash, and the other smaller communities.

This rather long pause in the industrial and demographic development of the Merthyr and Aberdare Valleys is very clearly reflected in the local house-building patterns for the major urban areas of these regions. In Merthyr Tydfil, the annual number of house plans approved fluctuated around a very low level until after 1890. This general time path was also followed by Mountain Ash and Aberdare except for
relatively high levels of building activity in the latter town from 1873 to 1876. The experience of these towns is in general disagreement with the course of house-building found in the South Wales regional index. Yet it may be argued that Weber's national index of residential construction reflects the local trends in the decade of the 'Eighties.

We have seen that when the building industry in Great Britain was depressed in the 1880's and early 1890's, Swansea and Cardiff were undergoing the most vigorous building booms they were to experience in the entire half century with which this inquiry is concerned. Other towns in South Wales also departed markedly from the national trend. The recorded number of house plans approved in Penarth and Llwchwr was relatively high in the 1880's, fell off after 1887, and 1889 respectively, and remained low for a decade thereafter.

In Newport, a building boom in the mid-eighties was interrupted between 1889 and 1891 by labour unrest and frequent work stoppages. The amiable labour relations that followed and the growing importance of Newport in the coal export trade contributed to an unprecedented building boom in this town during the 1890's. Growing economic activity and a dramatic increase in required housing accommodations are reflected in the upsurge in Newport's enumerated population from
38,000 in 1881 to 67,000 in 1901.\textsuperscript{53}

The Rhondda Valley was richly endowed with the finest quality steam coal in the United Kingdom. As the world demand for this commodity increased, greater energy was directed to the exploitation of the superior coal seams in the valley. A transportation network connecting the upper reaches of the Rhondda with Cardiff had been completed well before the mid-eighteen sixties. "In the ten years ending in 1875, sixteen new collieries were opened to these measures in the Rhondda Fawr and four in the Rhondda Fach. Yet despite the substantial contribution they had already made to the output of the valley they were mostly still in the process of being opened out. In the next decade the annual production of the valley was to rise by a further 3\frac{1}{2} million tons ..."\textsuperscript{54} This, however, was only the beginning of the full exploitation of the coal reserves in the Rhondda. The Census of Population provides us with further evidence on the progress of industrial development in the valley. In 1881, the total population of the Rhondda Valley was 81,895, by 1891 this had grown to 127,980 and in

\textsuperscript{53}Mitchell, \textit{British Historical Statistics}, p. 27.

\textsuperscript{54}Morris and Williams, \textit{The South Wales Coal Industry}, p. 115.
### TABLE X

**POPULATIONS OF THE MERTHYR AND ABERDARE VALLEYS, DECENNIALLY 1861-1891**

<table>
<thead>
<tr>
<th>Region</th>
<th>1861</th>
<th>1871</th>
<th>1881</th>
<th>1891</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merthyr Valley</td>
<td>69,618</td>
<td>54,741</td>
<td>51,712</td>
<td>61,135</td>
</tr>
<tr>
<td>Aberdare Valley</td>
<td>37,487</td>
<td>38,637</td>
<td>38,137</td>
<td>43,314</td>
</tr>
</tbody>
</table>

1914 it stood at 162,592.55

Throughout the period 1880-1914, house-building in the Rhondda Valley failed to keep pace with increases in population. This led to a generally high level of building activity in the towns of the valley as evidenced by the building series for Rhondda and Pontypridd. The time-shape of residential construction in these towns, however, bears a strong inverse relation to the national pattern. The number of house plans approved in the early 1890's was extraordinarily high, but fell off in the course of the decade. After the turn of the century, another tremendous boom in house-building got underway.

This latter upswing in the first decade of the Twentieth century was not unique to the towns of the Rhondda. It was a common experience of many of the communities throughout South Wales, being most pronounced in the towns of the Aberdare and Ebbw valleys. From high or increasing levels of building activity in the 1890's, residential construction in each of these towns rose to its highest peak in the following years: Ebbw Vale, 1909 and Abertillery, 1909 both of the Ebbw Valley;

55 Hodges, "Peopling of the Hinterland", pp. 69, 71.
Aberdare, 1906; Mountain Ash, 1905. Other towns that experienced dramatic increases in this period were Tredegar (after 1902), Rhymney, Llwchwr, Llanelly, Newport, Swansea, and Merthyr Tdyfil, where a phenomenal rise at the turn of the century was followed by another boom after 1906. The pervasive trend in residential construction for the various sectors of the regional economy is in marked contradistinction to the pattern traced by the national index.

The wide-spread coincidence of local booms in house-building during the fifteen years before 1914 is in part explained by the response of the regional economy to the long swing in overseas investment that got underway around the turn of the century. By this time the marriage of the South Wales coal industry to the international economy was complete. The decline of iron and the other metalurgical industries was accompanied by increased specialization in coal production and consequently greater dependence on and vulnerability to the state of international demand for coal.  

In the years following the First World War this latter characteristic of the regional economy became a chronic problem. The shrinking of world markets and the contraction of local industry in South Wales led to a loss of 242,000 persons by migration between the Census of 1921 and that of 1931. The volume of migration in the five years that followed 1931 was so high that there was an absolute fall in the regional population of over 100,000.\textsuperscript{57} We cite these facts only to illustrate the extent to which the local economy had become dependent upon external economic forces.

The most telling evidence of the far reaching participation of the broad sectors of the South Wales regional economy in the investment boom abroad is the fact that the tremendous magnetic attraction of 129,295 people to the colliery regions of Glamorganshire and Monmouthshire from 1901 to 1911 transformed Wales into an immigrant country. This dramatic demographic shift coupled with growing prosperity in local industry must have had a very favorable impact on builders expectations. Much general commentary on the growing speculative nature of the building industry in Great Britain

\textsuperscript{57} Rees, \textit{Studies in Welsh History}, p. 147
can be found in volumes of the *Building Societies Gazette* from the late 1890's and early 1900's. One speculative building got underway it was able to attract some of the capital flowing into the industrial sector. This may have been an important factor contributing to the feverish building booms throughout the South Wales coalfield in these two decades.

In this chapter we have studied in some detail the course of house-building in South Wales and its relationship to the national trend for Great Britain. A tentative explanation of the behavior of the regional house-building index has been presented in terms of economic and demographic factors unique to South Wales. This, however, was undertaken at the regional level of aggregation. In the final section we focused greater attention on the course of house-building at the local level. There are two important reasons for this. First, examination of aggregate indices alone, whether national or regional, may suggest patterns of behavior quite different from that existing in any one of the towns included in the indices. Second, we have found that the course of house-building differed, not so much from town to town, within the same valley, but significantly between towns of different valleys. This was in large part due to the topography of the
coalfiel as well as the interaction of geological, technical, economic, and demographic influences that were distributed unevenly in time over the entire coalfiel, but more uniformly over each valley.

The existence of considerable differences in the course of house-building at the town level renders the task of explaining an aggregate index hazardous without examining its local components. This, however, is not as critical a problem at the regional level as it is between the regional and national level. If there is a regional upswing in development this will stimulate a boom in house-building, and depending on the purpose of our analysis it may or may not matter if this boom is concentrated in the Rhondda or the Merthyr Valley. On the other hand if we are interested in the causal mechanism of the regional cycle, then we would want to consider more closely intra-regional reactions, such as, for example, demographic shifts and their causes. There are a number of important factors influencing the course of house-building that we have not discussed, or have mentioned only in passing. This has been the unfortunate consequence of not having access to local records and other relevant information. We have, for example, indicated the broad changes in population for important valleys and towns, but it would have been far more useful, for our purposes, to have been able to determine
the rate of house-hold formation in the coalfield from a breakdown of internal migration data, the marriage rate, and other factors. It is possible that increases in population over a number of years can be accompanied by changes in the marriage rate and - or changes in the sex and age distribution of the population such that the net rate of house-hold formation declines. Thus, because the rate of house-hold formation is the appropriate explanatory variable in a demand function for housing accommodation, one may find an inverse relationship between changes in population and the course of house-building. For the South Wales coalfield such considerations are very important. "The people who went into the coalfield were mainly young unmarried men, and as a result we find that in the coalfield parishes, the number of males greatly exceeds the number of females; note this especially in the districts which have most recently developed as did the Rhondda Valley, where the females only number about 84 per cent of the males. In the parishes outside the coalfield, the reverse is the case."58 Such changes in the characteristic mix of the local population

may help explain why in some towns like, Cardiff between 1901 and 1911, the house-building industry stagnated while the town's population increased from 164,000 to 182,000 persons.\(^{59}\) Certainly the observation that in the valleys "nearly every dwelling contained its 'lodgers', and such was the shortage of sleeping accommodation that beds worked double time-day and night"\(^ {60}\) was prompted by the specific influence of such demographic factors.

The dearth of information on rents and vacancies has, of necessity, caused us to concentrate on other matters. The aggregate rent indices of Bowley, Cairncross and Weber are clearly inappropriate. If we are going to discuss the influence of changes in rental rates on the level of building activity, then the analysis must consider rents and building in a particular locality.

In the third section of this chapter we devoted some attention to building costs, rates of return in the building industry and their relationship to the course of house-building. This, however, was in the context of our analytical model and


\(^{60}\) Hodges, "Peopling of the Hinterland", p. 70.
requires much more empirical work at the local level.

We have discussed only briefly, with respect to house-building in Swansea and Cardiff, the role of credit and in particular the activities of building societies. Very little information is available on these financial institutions, which funded perhaps as much as 25 per cent of the house-building in Great Britain during this period. This issue concerning the supply of credit, both long and short, is a complicated one, and must be studied further if we are to fully understand the mechanism of the building cycle in South Wales.

In light of these difficulties, we have attempted in this chapter to outline the broad regional and local differences in the course of house-building in South Wales. The regional time-shape of residential construction is conspicuous in its general upward trend and the absence of the familiar long swings. Our analysis of causal mechanisms suggests that the course of residential construction in South Wales was largely determined by the long run expansion of the coal mining industry which not only drew labour incessantly from border and distant counties but also led to periodic shifts of population within the region. Short run movements in house-building were
primarily a result of resource stringencies arising during periods of brisk expansion of the primary sector. Earlier we described how fluctuations in the export trade worked through a price-profit mechanism to determine the industrial disposition and utilization of scarce productive resources. Finally, we have seen that the long swing is a mythical concept at the local level, where house-building is especially prone to random movements and exhibits a wide variety of patterns. We have perhaps raised more questions than we have answered, but this only serves to point out that more study is required at the regional level.
RESIDENTIAL CONSTRUCTION IN SOUTH-EAST LANCASHIRE

A REGIONAL INDEX OF HOUSE-BUILDING IN SOUTH-EAST LANCASHIRE

Extensive examination of Surveyor's Registers and the records of local Health Officers for fifty towns in South-east Lancashire produced a similar number of statistical series of plans approved and houses erected which were used by J. Parry Lewis to construct a regional index of building activity in the Manchester conurbation.¹ This region is of special interest because it was (and still is) the center of the cotton industry in Great Britain.

The approach taken in this chapter is identical to that of Chapter V. We begin by outlining the course of residential construction in South-east Lancashire as reflected in the regional house-building index. A comparison of the regional experience with the national pattern (Weber's index of residential construction in Great Britain) will be followed by a tentative explanation of the course of house-building in this area. Here, once again, the emphasis will be on demo-

¹J. Parry Lewis, "Indices of House-Building in the Manchester Conurbation, South Wales and Great Britain, 1851-1913".

196
graphic and industrial factors peculiar to South-east Lancashire. Finally, we will examine more closely the behavior of the local components of the regional index.

The data used for the construction of the South-east Lancashire regional index were subject to the many problems encountered by Richards and Lewis in their study of house-building statistics for South Wales. The adjustments required to transform the raw data into a reasonable approximation of the actual number of houses built were very much the same as those employed in the former study. (See Appendix II).

The regional index of house-building in South-east Lancashire is presented in Figure 10 along with Weber's index of house-building in Great Britain. From a trough in 1857 house-building activity in this region climbed steadily to a minor plateau in 1862-63. The mid-1860's were years of severe depression in Bolton and Ashton-under-Lyne. This is reflected in a shallow trough in the regional index between 1863 and 1868. The major upswing that got underway in the late 1860's was interrupted briefly in 1871-72, and then continued to rise to a major peak in 1876-77. From a value of 37.9 in 1860, the regional index climbed to its highest level for the century, 169.7. This boom in residential
construction reflects the similar experiences of Altrincham, Ashton-under-Lyne, Salford, Oldham, Bury, Bolton and Rochdale.

House-building fell precipitously after 1877. By 1882 the regional index had plunged to a low of 51.7. Crisis in the building industry appears to have prevailed side by side with crisis in the cotton industry throughout Lancashire in the late 1870's. The depression in residential construction, however, was to persist for ten years. A minor upswing in 1883-85 was followed by six years in which there was no significant change in the regional index. Although local house-building patterns were far from uniform, the construction industry in Salford, Altrincham, Rochdale and Bury was especially hard hit.

The second regional long swing in the period 1860-1914 got underway in South-east Lancashire in the mid-1890's. House-building climbed to a major peak in 1898. The upswing in cotton consumption during these years brought a wave of prosperity to the cotton towns of Lancashire, Rochdale, Oldham, Salford, Burnley and Altrincham, all experienced a marked increase in industrial activity, including house-building.

A sharp decline in the regional index after 1898 was arrested in 1902 and residential construction in South-east
HOUSE-BUILDING INDICES FOR GREAT BRITAIN AND SOUTH-EAST LANCASTER

Source: Great Britain 1860-1914 - See Table XV, Appendix I
South-East Lancashire, 1860-1914 - See Table XVIII, Appendix III.
Lancashire remains at a relatively high level until 1909. The regional index falls off, thereafter, reflecting a general trend in all of the local series during the five years that preceded the outbreak of war in Europe.

**DIFFERENCES BETWEEN THE COURSE OF HOUSE-BUILDING IN GREAT BRITAIN AND SOUTH-EAST LANCASHIRE**

A comparison of the regional index of house-building in South-east Lancashire with Weber's index of residential construction in Great Britain points up a number of striking similarities. In general, the minor fluctuations as well as the long term trends in the regional index are reflected in the national house-building pattern from 1860 to 1898. In 1862-63, when house-building in South-east Lancashire had reached a minor plateau, Weber's index shows a minor peak. The trough in the mid-sixties was somewhat more prolonged in the cotton region than at the national level. The upswing that followed gained momentum faster in South-east Lancashire than the nation as a whole. A pause in the regional index in 1871 came two years before the minor reversal in Weber's index that interrupted the first long swing. The burst of house-building activity that followed, pushing the regional index to its highest point in 1876 was far more intense than
its counterpart in the national aggregate.

In the late 'seventies house-building fell rapidly both at the national and regional level. The building industry of Lancashire shared in the national depression of the 1880's. The upswing that followed, however, preceded the national upswing by nearly two years. Both indices climbed to a major peak in 1898, but in the opening decade of the Twentieth century, their courses departed dramatically. A national building boom in 1903 has no counterpart in the regional index. House-building fell sharply in South-east Lancashire between 1898 and 1902. Yet these were years of exceptionally high building activity for Great Britain as a whole. The regional index remained relatively unchanged from 1902 to 1909, while Weber's index fell steadily after 1903. Only in the four years prior to the outbreak of hostilities in 1914 did house-building in South-east Lancashire assume a course similar to that traced by the national index.

We will now examine in some detail the available evidence on the industrial and demographic history of South-east Lancashire. Our purpose here (as in Chapter V) is to try to relate the long swings in residential construction to the economic development of South-east Lancashire within the context of a developing national economy with changing commitments abroad.
Lancashire offered a number of natural advantages favorable to the development of the cotton industry. The raw materials required for manufacture had to be imported and much of the final product was destined for foreign markets. For this purpose, Liverpool provided unlimited storage and commercial facilities. The domestic market was also a major source of demand and Manchester as the central hub of the industry was conveniently situated for the home trade. In addition there were cheap local sources of coal for power. Water was plentiful for use in boilers and the finishing process. The climate in Lancashire is particularly suited to the production of cotton goods. Air currents blown in off the Atlantic contain a high percentage of moisture, and the general dampness makes the cotton fibres more flexible and causes them to cling together, thus reducing breakages. Chapman argues that the primary reasons for the cotton industry settling in Lancashire were "that the woollen industry was already there, that foreigners were kindly received, and that Manchester was not a Corporation." These

factors encouraged manufacture and commercial enterprise by the comparative freedom provided from local restrictions on industry and trade. However, once the industry was established, the natural or geographical advantages became important in drawing the manufacture progressively to Lancashire.

The concentration of the cotton industry in Lancashire was a strategic factor in realizing the advantages of specialization which tended to encourage still further the localization of production. Table XI provides striking evidence of this trend. In 1835, 59 per cent of the cotton operatives employed in England and Wales were located in Lancashire. This had grown to 87 per cent in 1881 and by 1911 the percentage of the domestic cotton industry concentrated in Lancashire and the border area of Cheshire had reached its peak i.e., 90 per cent in terms of employment.

In the course of the Nineteenth century the Lancashire cotton industry achieved a degree of internal specialization and division of labour unknown elsewhere. There are numerous technical and commercial reasons why, for example, spinning and weaving became separate branches of the industry associated with rather different types of firms and these have been
TABLE XI

LOCATION OF THE COTTON INDUSTRY IN ENGLAND AND WALES, 1835-1921
(000's)

<table>
<thead>
<tr>
<th></th>
<th>1835</th>
<th>1881</th>
<th>1911</th>
<th>1921</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALE</td>
<td>FEMALE</td>
<td>TOTAL</td>
<td>MALE</td>
</tr>
<tr>
<td>(A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number engaged in cotton industry in Lancashire and Cheshire</td>
<td>54</td>
<td>75</td>
<td>129</td>
<td>160</td>
</tr>
<tr>
<td>(B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number engaged in cotton industry in England and Wales</td>
<td>100</td>
<td>119</td>
<td>219</td>
<td>185</td>
</tr>
<tr>
<td>(A) as % (B)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>59</td>
<td>87</td>
<td>90</td>
<td>89</td>
</tr>
</tbody>
</table>

discussed elsewhere. The two operations also tended to be separated geographically within South-east Lancashire. Thus spinning was largely concentrated in the south and in the northern border region of Cheshire. But even within this area there was further specialization. The finer yarns were spun in the neighborhood of Bolton and Manchester, where there was a great demand for sewing thread. Coarse yarns were produced in Oldham and the surrounding towns. The weaving operations of the industry were chiefly conducted in the North, and here again there was a geographical differentiation of productions. Fine and light fabrics are produced in Preston and Chorley, while shirtings and other goods primarily destined for the India trade are manufactured in Blackburn, Darwin and Altrincham. Bolton is the center for fine quiltings and fancy cotton dress goods. Specialization also extended into the various processes following that of weaving, e.g., calico printing, bleaching, dying, mercerizing and finishing.

Intra-industry differences in the structure of production

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and trade, i.e., optimal size of firms and commercial organization, were often important factors contributing to local variations in prosperity and development. Weaving, for example, could be conducted profitably on a small scale, but spinning generally required a greater commitment of fixed and working capital. Because there were so few barriers to entry (looms were cheap and could be put up almost anywhere) weaving was far more competitive than spinning, and profits were, thus, more rapidly eliminated. As a consequence, this branch of the industry tended to respond quickly to changes in market conditions, while spinning lagged somewhat behind. To some extent this derived from the structure of the markets facing the two major branches of the cotton industry: spinners had many markets in which to sell their goods, while the large number of weavers had relatively few.

The applications of technical innovations to the various branches of the cotton industry at different times often meant that a wave of prosperity in the innovating sector coincided with periods of depressed activity in other sectors. The experience of Oldham and Ashton-under-Lyne in the 1880's provide a good example.
These towns "Were booming because they had developed their mule twist business. Mule was cheaper than warps made from throstle yarns. Keen competition had reduced costs but had also reduced prices, and the manufacturer who made most cheaply survived at the expense of the old fashioned throstle spinners. These were located largely in Burnley, Rosendale and Rochdale, and so we see those areas experiencing less happy times than Oldham saw."5

Thus, despite the highly localized nature of the industry and the more or less strong linkages between the various sectors there are reasons to expect that the local patterns of development within South-east Lancashire may have differed significantly. We will return to this issue in the final section of this chapter.

By 1860 the cotton industry of Lancashire and the border regions to the south and east had grown to impressive dimensions. At that time there existed nearly two thousand cotton mills employing half a million operatives. The importation of 1390 million pounds of raw cotton kept no less than 300,000 power looms and 211/2 million spindles operating near capacity.6 A very large percentage of this growth took place

5 J. Parry Lewis, Building Cycles and Britain's Growth, p. 117.

in the decade before 1860. Between 1850 and 1861 the number of looms in the weaving sector of the cotton industry (U.K.) increased by 150,635 or 60 per cent. While the number of spindles added in the spinning sector totalled 9,410,450, an increase of 39.1 per cent.\(^7\) This tremendous expansion in productive capacity, especially in the years 1859-1861, made possible the production of far more cotton cloth than available markets were ready to absorb.

The Lancashire cotton industry was highly dependent upon the Southern United States for her supplies of raw cotton.\(^8\) The outbreak of the American Civil War and the imposition of the Blockade led to an abrupt curtailment of cotton shipments to Great Britain. In 1861 British cotton imports totalled 1,261,400,000 pounds. A year later they had dropped by nearly 60 per cent to 533,100,00 pounds and it was not before 1865 that the former high level was regained.\(^9\) There can be little question that


\(^9\) Henderson, *Lancashire Cotton Famine*, p. 35.
the Cotton Famine contributed to the depression in the cotton industry during the period 1861-1864, however, the crisis was not due entirely to the shortage of raw material.

We noted above the marked increase in the productive capacity of the U.K. cotton industry from 1850 to 1860. Data referring specifically to the segment of the industry located in Lancashire is not available. However, it may be recalled that the operations of the industry are almost entirely confined to this region and thus the data for England and Wales presented in Table XII may be considered reasonable approximations to actual changes in the local industry.

In the years 1859 and 1860 the Southern United States supplied the world market with far more cotton than was needed. At the same time there was a sharp increase in the demand for cotton goods in the Far East. With abundant supplies of raw cotton being made available at falling prices and unusually favorable market conditions, Lancashire cotton manufacturers responded by operating their mills at capacity and, as shown by Table XII, by investing heavily in new mills and machinery to increase their capacity. Between 1858 and
### TABLE XII

Changes in the Number of Factories, Power-Looms, Spindles and Persons Employed in the Cotton Industry of England and Wales, 1858-68

<table>
<thead>
<tr>
<th>Year</th>
<th>Factories</th>
<th>Percentage Change</th>
<th>Power-Looms</th>
<th>Percentage Change</th>
<th>Spindles</th>
<th>Percentage Change</th>
<th>Persons</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1858</td>
<td>2,046</td>
<td></td>
<td>275,590</td>
<td></td>
<td>25,818,576</td>
<td></td>
<td>341,170</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td>33</td>
<td></td>
<td>10</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>2,715</td>
<td>-11</td>
<td>368,125</td>
<td>-6</td>
<td>28,352,152</td>
<td>7</td>
<td>407,598</td>
<td>-12</td>
</tr>
<tr>
<td>1868</td>
<td>2,405</td>
<td></td>
<td>344,719</td>
<td></td>
<td>30,478,228</td>
<td></td>
<td>357,052</td>
<td></td>
</tr>
</tbody>
</table>

1861, 669 new cotton mills were constructed, an increase of 32 per cent. The number of power looms in operation rose by one third, while there was a ten per cent increase in the number of spindles. The labour force swelled with 66,428 new cotton workers. Many of these were migrants from agricultural regions and border counties. The growth of the labour force added to the demand for housing accommodations and the prosperity of these years made this demand effective. The house-building industry participated in the general regional construction boom that got underway after 1857.

The tremendous growth of productive capacity led to considerable over-production in the cotton industry and the accumulation of millions of pounds of unsold cotton goods. To some extent the Cotton Famine provided relief from this condition by forcing a reduction in output. But whatever short-run benefits were gained by a few manufacturers and brokers, they were far outweighed by four years of depression in the cotton industry. And because this industry dominated the regional economy of Lancashire, the crisis was even more acute.

The impact of the crisis is clear from Table XII. Between 1861 and 1868, over three hundred mills closed their
doors. The number of power looms in operations fell by 6 per cent, and though there was a slight increase in the number of spindles, employment in the industry as a whole declined by 12 per cent. But this hardly tells the entire story.

"At the crisis of the famine (in November, 1862) there were 247,230 operatives out of work, and 165,600 working short time. In the same month no less than 485,454 persons, or nearly one-fourth of the entire population of the districts affected, were in receipt of relief ... During the course of the famine the losses of the trade amounted to between £65,000,000 and £70,000,000, including from £28,000,000 to £30,000,000 loss of wages to operatives. Of the latter about one-fourth was recovered in the form of relief, or in wages for employment on Public Works, etc. Many mill owners also regained a portion of their losses in the shape of profits on stocks held at the commencement of the famine; but a large number lost nearly everything they were worth, while many were reduced to bankruptcy."10

A crisis of such severity could not help but have an adverse influence on house-building. The high level of unemployment resulting from the dislocation of the cotton trade prompted many operatives to leave Lancashire for other parts of England or to emigrate overseas. The Victoria

Emigrants' Assistance Society and the Manchester Emigration Society were only two of many local emigration societies formed to assist unemployed operatives and their families in relocating where work was available. Many of those emigrating from Lancashire found employment in the worsted and woollen industries of Yorkshire. In addition to out-migration, there was an increase in the sharing of accommodations. Numerous reports of Medical Officers and Relief Societies cite the growing tendency toward overcrowding of houses among the operative class in the cotton districts. These various consequences of the depression in the cotton industry significantly reduced the demand for house room. But there were also factors on the side of supply that did not favor an increase in house-building at this time.

A series of bad harvests in 1860-62 necessitated large imports of food. At the same time gold was withdrawn by the United States to pay for the Civil War, and by France for public investment at home. Prior to 1861 Great Britain had purchased the great majority of her raw cotton supplies from the U.S. with exports of manufactured goods, but during

the Cotton Famine she turned to India, Egypt and Brazil for her sources of supply, paying primarily with gold and silver.\textsuperscript{12} The ultimate effect of all these factors was a drain on official reserves and a general stringency of credit.

The financial crises of 1864-66 and the uncertainty associated with the future of the cotton trade also had a generally depressing influence on expectations and credit conditions. The fall of Overend and Gurney in May, 1866 only served to compound a credit crisis that had been apparent since early in the year. The \textit{Economist} observed in July, "the principal centres of credit - the banks and discount firms - had done so much apparent bad business that the trust in many of them was weakened and a fatal pressure on a few of them created."\textsuperscript{13} Thus, the vicissitudes of the financial market were unfavorable to investment in housing since they tended to raise the costs of financing both the purchase and construction of houses.

The years immediately following the end of the American Civil War witnessed a marked improvement in the world cotton


### TABLE XIII

**RELIEF EXPENDITURES BY THE GUARDIANS AND RELIEF COMMITTEES 1860-1965**  
*(in pounds sterling)*

<table>
<thead>
<tr>
<th></th>
<th>1860-61</th>
<th>1861-62</th>
<th>1862-63</th>
<th>1863-64</th>
<th>1864-65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guardians</td>
<td>191,101</td>
<td>231,322</td>
<td>660,531</td>
<td>577,368</td>
<td>392,076</td>
</tr>
<tr>
<td>Relief Committees</td>
<td>---</td>
<td>---</td>
<td>809,167</td>
<td>563,287</td>
<td>188,012</td>
</tr>
<tr>
<td>Total</td>
<td>191,101</td>
<td>231,322</td>
<td>1,469,698</td>
<td>1,140,655</td>
<td>580,088</td>
</tr>
</tbody>
</table>

Source: Thomas Ellison, "The Cotton Trade of Great Britain"  

Table XIII does not include expenditures and donations by millowners and other private citizens which probably amounted to three or four million pounds.
trade. British manufacturers responded by feverishly expanding production and thus precipitating a crisis similar to that of 1860-61. In fact, there was a strong tendency toward industrial overproduction in cotton goods from 1865-1869. However, these were years of increasing employment and rising incomes, both of which contributed to a minor upswing in housebuilding.  

The recovery of the cotton trade in the late 1860's culminated, after a pause in 1869, with the exceptionally prosperous years of 1870-72. In many ways this period is a watershed in the history of the Lancashire cotton industry. According to Ellison

"In that season (1870-71) Great Britain consumed 23.7 per cent, the Continent 20.1 percent, and the United States 16.2 per cent, more than the average of the five years, 1865-70. It was in fact a period of inflation, not in cotton only, but in every other article of merchandise. There was a temporary interruption in business on the Continent during the Franco-Prussian war; but this only caused the inflation to take a more

14 The total number of operatives employed in the cotton factories of the United Kingdom fell from 451,600 in 1862 to 401,100 in 1867; by 1870 employment had climbed back to 450,100. See G.R. Porter, The Progress of the Nation, (London: Methuen and Co. Ltd., 1912), p. 317
aggravated form after the war was over. In the meantime, the war, by withdrawing a multitude of French and German operatives and artisans from industrial employment, led to an abnormal demand for English textiles."15

Under such favorable circumstances unusually high profits were not uncommon. Between 1867 and 1871 the directors of the Sun spinning mill in Oldham declared dividends ranging from 10 to 40 per cent. Exceptional profits and dividends stimulated the expansion of production not only by providing the necessary incentive, but also by attracting savings for investment purposes. This was of crucial importance not only because it enabled a major boom in the construction of cotton mills to take place, but also because it eased the credit constraint on the supply of mortgage finance, thus contributing to a similar boom in house-building. The wave of expansion in the 1850's was concentrated in the weaving branch of the cotton industry, but in the late 1860's investment took place primarily in the spinning sector. The great "floating mania" which culminated in 1875 witnessed a dramatic increase in the numbers of joint stock companies registered in the

English cotton industry. This is shown in Figure 11. "In the two years, 1874-75, about 3,000,000 spindles were "floated" in Oldham alone, while, including private firms converted into limited companies, 5,000,000 to 6,000,000 more were "floated" in other towns and districts of Lancashire." Weaving, though not the center of investment activity, did participate in the general growth of productive capacity. The number of power looms operating in Great Britain increased by 23,442 or 5 percent between 1870 and 1874.

The story of the Lancashire cotton region during these years is partly told by Figure 11. The upswing in exports of cotton manufactures and home consumption in response to favorable market conditions was accompanied by a rise in incomes. The working classes who suffered so severely through the depression of the sixties shared in the prosperity of recovery. From a minor trough in 1869 to weekly wage of cotton operatives rose to a peak in 1877. Not only did wages rise, but employment rose as well. In 1867 the cotton industry employed 401,064 persons, by 1874 this had

16 Ibid, p. 134.
INDICES OF ECONOMIC DEVELOPMENT IN SOUTH-EAST LANCASHIRE

(A) South-East Lancashire House-Building Index.  
Source: Table XVIII, Appendix III.

(B) Number of Joint Stock Companies Registered in the  
English Cotton Industry, 1861-1890.  
Source: D.A. Farnie, The English Cotton Industry,  
1850-1986, M.A. Thesis: Manchester University, 
Cited by J. Parry Lewis, Building Cycles and Britains  
Growth, p. 120.

(C) Index of Profits in the Cotton Spinning Industry,  
1886-1913, (1896-1905 = 100).  
Source: H. Campion, "Prewar Fluctuations of Profits 
in the Cotton-Spinning Industry", Journal of the  

(D) Average Weekly Wage of Cotton Operatives Employed in  
Factories and as Hand-Loom Weavers, 1860-1906.  
Source: G.H. Wood, "The Statistics of Wages in the  
Nineteenth Century. Part XIX. - The Cotton Industry", 
Journal of the Royal Statistical Society, Vol. LXXIII  
(June, 1910), p. 599.

(E) Home Cotton Consumption (in millions of pounds),  
1860-1914.  
Source: R. Robson, The Cotton Industry in Britain,  

(F) Exports of Cotton Manufactures (in millions of pounds  
sterling), 1860-1914.  
Source: R. Robson, The Cotton Industry in Great Britain,  
p. 334.
grown to 479,515. Rising wages attracted labour from the border counties and as the populations of the cotton towns swelled, so also did the demand for housing accommodation. The persistent rise in incomes allowed families that had crowded together years before, to now undouble. Relatively low food prices and the falling prices of manufactures, including cotton goods, especially after 1873, released earnings for improvements in the standard of housing. These factors contributed to a decline in vacancies and the widespread appearance of housing shortages. By 1876, all of the towns for which we have data were experiencing a major boom in house-building.

As the growing prosperity of the staple industry multiplied through the regional economy membership in and subscriptions to building societies burgeoned.

"There are also exceptional towns and villages in Lancashire where large sums of money have been saved by the operatives for buying or building comfortable cottage dwellings. Last year Padiham saved about fifteen thousand pounds for this purpose, although its population is only about eight thousand. Burnley has also been very successful. The Building Society there has six thousand, six hundred investors, who saved last year one hundred

\[18\] Ibid.
and sixty thousand pounds, or an average of twenty four pounds for each investor. The members consist principally of mill operatives, miners, mechanics, engineers, carpenters, stone-masons and labourers. They also include women, both married and unmarried. Our informant states that "great numbers of the working classes have purchased houses in which to live. They have likewise bought houses as a means of investment!" 19

There can be little question that building societies played a key role in the South-east Lancashire regional long swing in house-building activity. Manchester alone had over one hundred building societies, and the 66 located in Oldham held subscriptions totalling 800,000 pounds. 20 The accumulated savings of thousands of textile workers, spinners, entrepreneurs, etc., were mobilized through these and other financial institutions for the purpose of investment in cotton mills and dwelling houses.

By the end of 1872 the cotton textile industries of France and Germany were beginning to recover from the war. The revival of Continental production at prices below the


inflated British products led to a decline in demand and consequently a fall in the export of cotton manufactures. (See Figure 11). In the United States the failure of Jay Cooke and Company in 1873 resulted in American cotton consumption remaining stationary for two years. Falling prices led to an increase in home consumption of cotton goods in 1873-74. (See Figure 11) Britain chose to increase output at this time, as did France and Germany. It wasn't long before "the whole of Europe's cotton industry was burdened with heavy stocks and unprofitable prices. Investment slowed down, or even ceased. In 1875 the Eastern trade was disorganized by financial failures, and when hopes and output revived in 1876, gloom descended quickly as bad harvests and other factors reduced demand."21

The building boom in mill construction that took place in the early 1870's created an excess capacity that was to be a source of recurrent difficulties in the years that followed. The depression that set in after 1875 was accompanied by a sharp fall in the number of joint stock companies registered in the English cotton industry. Between 1878 and 1884 many of the Lancashire cotton mills were closed down. As prices continued to fall, profits disappeared and dividends

21 Lewis, "Indices of House-Building", p. 121.
became a thing of the past. Mill owners responded by lowering wages, which ushered in a period of labour unrest, thus further augmenting the industrial crisis.

In 1877 operatives in Bolton struck in response to wage cuts by local spinning mill owners. The strike quickly exhausted the treasury of the Spinners' Amalgamation and was largely unsuccessful. The following year witnessed the "Great Strike" of more than 100,000 North Lancashire operatives against reductions in wages, lasting nearly two months. In 1880 a strike by weavers for a return to pre-1878 wage levels put 30,000 Blackburn operatives out of work. A year later doubling workers in Oldham did win a minor wage increase, but only after a six month strike. In general, the strikes, combined with increased unemployment, short-time and falling wage rates, led to a decline in incomes as well as a decline in the rate of increase of the labour force. These factors had a very depressing influence on the demand for housing.

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accommodations. Reports were not uncommon of operatives and their families migrating to other regions "leaving streets of empty tenements and houses, many of which were dilapidating. So great was the combined effect of sharing and migration that in 1881 the number of unoccupied houses in Manchester and Salford exceeded the number of inhabited houses in adjacent Stockport."\(^{25}\) The building industry was dealt a crippling blow. House-building fell precipitously after 1876 into a deep prolonged trough. (See Figure 11).

These were troubled years for building societies as depressed earnings and widespread pessimism led to withdrawals of funds and failure to make payments. Societies suffered in numerous circumstances many of which were entirely beyond their control. In October of 1878, the City of Glasgow Bank failed. Rumours circulated that a number of building societies in and around Manchester, including the Queen's Society (the fourth largest in Great Britain) had balances at the City of Glasgow Bank, and though these rumours had no justification in fact, they did cause a run on many societies. In only four days, 50,000 pounds sterling

was withdrawn from the Queens Society. 26

Building societies also became the innocent victims of labour disputes. The Burnley Society had in the past made loans to local mill-owners, some of them directors of the society. When weavers struck against wage reductions in 1878 they withdrew their funds from local societies, thinking that owners would then be unable to borrow money to meet mortgage payments and other expenses during the dispute. "No doubt strikers withdrawing their savings to meet current expenses, and the news of events in Manchester, helped to speed withdrawals. The result was that the Burnley Society's cash balance of £15,000 quickly disappeared. Notices of withdrawal in the last two weeks of October rose to nearly £50,000 and by December they had climbed to nearly £75,000 compared to a normal figure of £10,000." 27

In testimony before the Royal Commission of 1885 one witness stated that the building society movement had been so disrupted by the events of the late 1870's and early 1880's that it would take 20 years to recover. 28 This is no doubt

27 Ibid.
an exaggeration, but it is certainly true that the building societies faced many difficulties, not the least of which was a crisis of confidence, and that these contributed to the building depression of the 1880's.

The excess supplies of yarn and cotton goods that had accumulated in the world's markets by the mid-1870's were eventually absorbed during the depressed years of 1877-79. Between 1880 and 1883 there was a major upswing in the production of cotton manufactures, especially in Great Britain and the United States. World cotton consumption rose to 9.6 million bales per year, compared to the annual average of 7.2 million in 1878-79. British exports of cotton goods and home consumption increased sharply. (See Figure 11). Enormous American crops, especially in 1883, caused a sharp decline in raw cotton prices, further stimulating the manufacturing (weaving) branch of the industry. The result was reminiscent of the early 1870's. Table XIV gives an account of the number and nominal capital of "limited" cotton mills floated in each of the years 1873 to 1884. Many of the joint stock companies registered in 1873-75 had been private firms which were converted to limited liability ownerships. The companies formed in 1881-84, on the other hand, were almost all new enterprises. And because they
<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Nominal Capital</th>
<th>Year</th>
<th>Number</th>
<th>Nominal Capital</th>
<th>Year</th>
<th>Number</th>
<th>Nominal Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>1873</td>
<td>40</td>
<td>1,784.600</td>
<td>1877</td>
<td>19</td>
<td>1,180.000</td>
<td>1881</td>
<td>25</td>
<td>1,742.000</td>
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<tr>
<td>1874</td>
<td>101</td>
<td>5,790.400</td>
<td>1878</td>
<td>10</td>
<td>328,500</td>
<td>1882</td>
<td>24</td>
<td>1,908.500</td>
</tr>
<tr>
<td>1875</td>
<td>84</td>
<td>3,992.700</td>
<td>1879</td>
<td>6</td>
<td>257,000</td>
<td>1883</td>
<td>24</td>
<td>1,580.000</td>
</tr>
<tr>
<td>1876</td>
<td>17</td>
<td>953,000</td>
<td>1880</td>
<td>23</td>
<td>867,000</td>
<td>1884</td>
<td>45</td>
<td>2,597.500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>242</td>
<td>12,520.700</td>
<td>58</td>
<td>2,632.500</td>
<td>118</td>
<td>7,828.000</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Capital per mill</td>
<td>51,740</td>
<td>45,390</td>
<td>66,340</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

employed the latest machinery and techniques "the 118 mills represented a greater increased power of production than the 225 mills projected in 1873-75. There can be no doubt that what may be termed the abuse of the Limited Liability Act of 1862, has largely contributed to bring about the long continued unsatisfactory condition of the cotton industry." 29

As overproduction once again weighed heavily on the Lancashire cotton industry unemployment rose and wages fell. It wasn't long before looms began to be taken out of production "either voluntarily, or through bankruptcy, or in consequence of strikes against reduced wages." 30 The fate of the cotton industry was shared not only by the operatives, but also by the general populace, "there is scarcely a publican, railway porter, policeman, or shopkeeper who is not a shareholder." 31 Thus when profits and dividends were nil and share prices depressed, so also were savings. And it was out of the savings

of operatives and common folk that much of the financing of cotton mills and cottages was drawn.  

The 1880's and early 1890's were difficult years of adjustment in Lancashire. The waning of British economic hegemony had a direct impact on the domestic cotton industry. Between 1860 and 1870 the total increase in cotton consumption between the United States, Great Britain and the Continent was very evenly distributed. But between 1871 and 1883 "the lions share was taken by the United States and the Continent, leaving only a small increase for Great Britain." Not only did British cotton exports suffer at the hands of U.S. and Continental competitors, but increasingly through the 1880's and 1890's there were complaints of the decline in the East African and Far Eastern trade as a result of competition from a growing Indian cotton textile industry located in Bombay. These changes in world market conditions are reflected in the curve of British cotton good exports presented in Figure 11, as a gradual decline from 1881 to around 1897.

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34 See The Economist, May 28, 1885, p. 625; July 3, 1866, pp. 831-832; December 18, 1886, p. 1573; October 5, 1889, pp. 1267-68.
The average weekly wages of cotton operatives remained relatively low throughout the 1880's. A series of poor harvests and high food prices combined with depressed earnings to reduce demand for housing accommodation. Earlier we mentioned the tendency of families to double up, which had a similar effect. House-building remained depressed, as did the Lancashire cotton industry (except for a brief upswing in home consumption in the late 1880's) until the mid-1890's.

The final decade of the nineteenth century opened on a not too encouraging note for the Lancashire cotton trade. A decline in exports and home consumption coincided with a depression in profits. (See Figure 11). Campions profit index falls from a peak in 1890 and shows losses incurred between 1892-4. Despite a fall in Lancashire's main export demand for piece goods and complaints of idle weaving machinery, home consumption increased and profits were made in 1895. Trade conditions were unsettled in 1896-7, but in 1898 annual trade reports indicate "increased signs of Activity induced by exceptionally low raw material prices and the conviction that economic forces generally were bringing

35 The Economist, April 13, 1895, p. 485.
about a reaction after the long period of depression." 36
Earnings rose to their previous high levels. "The limiteds of South Lancashire have declared larger profits than anticipated, and paid dividends that were not expected." 37
The remunerative state of trade and the general prosperity that spread through the regional economy led to a boom in mill and house-building, the former concentrated primarily in the spinning centers of the industry.

Short time disappeared and as employment rose idle machinery was brought into production. The condition of the operative class improved considerably. To some extent this as well as the progress of the industry, is reflected in the decline of labour unrest in the course of the decade. In 1890 there were 135 recorded disputes in the cotton industry. This rose to 156 in 1891 and then fell to 52 in 1898 and 44 in 1899. The disputes recorded after 1894 were all minor, involving no more than a few days interruption of production. 38

The turn of the century brought a decline in home

37 The Economist, July 2, 1898, p. 969.
consumption, and in 1903-04 raw cotton prices rose sharply. This was accompanied by a slump in profits. Campion's index shows losses in 1902-03. A renewed upsurge in home consumption, however, and the tremendous rise in cotton good exports (see Figure 11), after 1903 gave a significant boost to the local economy. Changes in market conditions and industrial organization gave rise to a dramatic increase in profits and contributed to a period of feverish mill-building. The Economist's correspondent in Lancashire wrote in 1904:

"New cotton spinning mills are being erected on an extensive scale in various parts of Lancashire ... What the Bolton trade will be when these factories get to work no one can tell, but it looks simply disastrous that this large increase of spindles should take place when there is really no demand for them."40

But the trade was brisk and in 1905 mills went up in Heywood, Ashton-under-Lyne and the surrounding districts adding 5,000,000 new spindles in that year.41 In 1908, 48 mills


40 The Economist, October 15, 1904, p. 87.

41 The Economist, October 14, 1905, p. 1623.
in the course of construction. The reaction finally came in the following year. The decline in home consumption and exports saw many of the joint stock companies, floated on inadequate capital during the boom, in financial difficulties. By the end of 1909 a number were already in the process of voluntary liquidation.  

The regional boom of the late 1890's witnessed a gradual increase in the average weekly wages of operatives. A somewhat sharper increase occurred after 1903. As emigration overseas slackened in the 1890's, people of the house-seeking age group constituted a larger share of the new increase in population. Many of these people were attracted to the cotton towns of Lancashire because of employment opportunities and the expectations of higher incomes. The prolonged building depression of the 1880's and early 1890's had allowed time for vacancies resulting from the previous period of over-building to be reduced. As profits rose in the cotton industry capital flowed in to take advantage of the high returns on investment in the regional economy. This eased local credit conditions and favored investment in residential construction as well. These were all important factors contributing

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42 The Economist, April 11, 1908, p. 777; April 17, 1909, p. 817.
to the upswing in building activity which was a prominent feature of the home boom in the 1890's.

The financial stringency associated with the Boar War and the crisis in the cotton industry which followed in 1902-03 brought house-building down quickly. However, the upswing in home consumption and the phenomenal rise in exports after 1903 precipitated a wave of highly speculative investment in the Lancashire cotton industry which had a marked spillover effect in house-building. Incomes remained relatively high compared with other regions of the country until depression descended in 1908-09. Building fell off thereafter as poor harvests caused food prices to rise and expenditures on housing accommodation declined.

We have attempted here, to briefly trace the economic development of Lancashire, drawing attention to the inter-relationships between regional industrial development and the course of house-building. We have seen that investment in residential construction tended to follow the fortunes of the cotton industry. This contrast, at least in the short run the experience of South Wales. When prices and profits rose in the coal industry, investment took place, but at the expense of house-building. There are a number of reasons for
these differences. For one thing the gestation period of investment in coal mining is much longer than in cotton textile production. Looms can be set to work in a shed, but it takes years to open out a new mine. The capital requirements of investment in collieries are very large relative to most branches of the cotton industry. Yet it was the latter which exploited to the fullest the advantages of limited liability, while the coal industry was dominated by private family firms. The cotton operatives of Lancashire, as well as the butcher, the baker and the candlestick-maker were "capitalists" in a very important respect: their savings were held as share capital, either in joint stock cotton mills, banks or building societies. For these reasons periods of prosperity in Lancashire had a more widespread and intense impact on the regional economy than they did in South Wales.

We have not attempted to give a complete and rigorous account of the causal mechanism by which regional building cycles have arisen. For one thing little has been
said about migration and population change; these will be discussed in the next section. Before such a mechanism can be specified more intensive study is required.

DEMOGRAPHIC FACTORS AND THE COURSE OF HOUSE-BUILDING IN SOUTH-EAST LANCASHIRE

We have explored briefly the interrelationships in the development of the Lancashire cotton industry and the course of residential construction reflected in the South-east Lancashire regional index of house-building activity. Attention was drawn to the migration of labour into and out of the region during periods of prosperity and depression, and the extent to which these demographic movements reinforced upswings or accelerated downswings in residential construction. In this section we will look closer at the demographic experience of Lancashire in an attempt to relate changes in the population to the pattern of building activity. A study of the fluctuations in the regional population, through both natural increase and migration will provide greater insight into the local mechanisms of economic development.

The data used here are drawn largely from the Inland Revenue ledgers, the Census of Population and the researches
of Cairncross and Thomas. Once again, the problem of available data at the appropriate level of aggregation raised its ugly head. Unfortunately, comprehensive demographic statistics for all of the towns included in the regional house-building index do not exist. The Census of Population however, does contain decennial estimates of the population in each of the large towns in South-east Lancashire, as well as for each county in Great Britain. So that this data might be used to explain fluctuations in the course of house-building, Thomas constructed a regional index of residential construction from the Inhabited House Duty statistics found in the Inland Revenue ledgers. These records contain annual estimates of the number of houses assessed to duty on a county-wide basis. In Chapter II we discussed a number of the difficulties associated with these statistics, in particular, the effect of periodic re-valuations. To overcome this problem Thomas has "averaged inter-revaluation years plus the revaluations year following them; this prevents any misleading impression that the series can be used for annual changes and at the same time provides

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44 Brinley Thomas, "Demographic Determinants of British and American Building Cycles, 1870-1913".
an adequate indication of the time-shape." The I.H.D. regional index, constructed in this way, provides annual approximations of the number of houses built in the counties of Lancashire and Cheshire from 1875 to 1912. Because we do not have access to the original disaggregated data, it is not possible to construct an index more appropriate for our own purposes, i.e. of Lancashire alone. The inclusion of Cheshire on the other hand has only a minor influence on the final results.

The I.H.D. index covers a region that is somewhat larger than that represented by the index graphed in Figure 10. In an attempt to determine the extent to which the I.H.D. index is representative of South-east Lancashire we have presented both indices in Figure 12 along with annual estimates of house-building in Liverpool. The indices for Liverpool and South-east Lancashire are, of course, the major "components" of the I.H.D. index.

The peak of 1878 in the number of houses erected in Liverpool is in close agreement with the peak in the I.H.D. index from 1877 to 1879. The South-east Lancashire index rises to its peak one year earlier, however, a sharp decline

\[45\] *Ibid*, p. 5.
Figure 12

MIGRATION, NATURAL INCREASE AND HOUSE-BUILDING IN LANCASHIRE
1871-1913

(A) Houses Erected in Liverpool, 1892-1914.

(B) Index of House-Building in South-East Lancashire (1901-11 = 100), 1860-1914.
Source: Table XVIII, Appendix III.

(C) Inhabited House Duty Index – Number of Houses
Built in Lancashire and Cheshire, 1875-1912.
(Inter-Reassessment Years Averaged).
Source: Table XX, Appendix III.

(D) Change in Population Aged 20-44, Natural Increase
and Migration, Quinquennially, 1871-1910.
Source: Table XIX.

Net In-Migration

Net Out-Migration
to the trough in 1883-5 corresponds very nearly with the pattern traced by the I.H.D. index. The downswing in Liverpool is more gradual but continuous while the other indices remain at a very low level until the second long swing gets underway in 1892-4. The boom in the late 1890's and the subsequent decline in South-east Lancashire is reflected with a lag in the measure for Lancashire-Cheshire. The relatively high level of building activity shown by the I.H.D. index between 1899 and 1903 reflects a balance between the weakening boom in South-east Lancashire and the continued high level of house-building in Liverpool.46

Figure 12 conveys the impression that house-building in South-east Lancashire followed closely the time-path outlined by the I.H.D. index. To a large extent, this is explained by the similarity of the experience of Liverpool and South-east Lancashire and the tremendous weight accorded these components in the larger regional index. We might thus reasonably assume that the demographic determinants of the course of house-building in South-east Lancashire are basically the same as those operating in the broader region of Lancashire and Cheshire. This assumption underlies the analysis

46 Ibid, p. 11
in the remainder of this section.

Following Thomas\(^47\) and Feinstein\(^48\) among others, we will assume that the age group 20-44 constitutes the great majority of the house-seeking segment of the population. By separating the effect of natural increase and migration on changes in the regional population aged 20-44, we can perhaps gain some understanding of the relative importance of these factors in explaining the regional pattern of house-building activity.

Thomas defines "natural increase" in the age group 20-44 as "an estimate of the population change which would have occurred in this age group in the two quinquennia following each census, if there had been no migration in either of these periods."\(^49\) Such changes result from variations in the excess of births over deaths in earlier periods. The Census of Population contains decennial totals in quinary age groups for each county in Great Britain. These

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\(^{49}\) Thomas, "Demographic Determinant", p. 7.
figures are obviously the resultant of natural increase and net migration over a ten year period. Thomas has combined the census data with age specific figures on recorded deaths contained in the Registrar-General's annual reports and decennial supplements to derive estimates of quinquennial changes in the population aged 20-44, had migration not taken place. The difference between these estimates and the actual census totals represents the net migration for the decade. Information on the years in which profit income was rising contained in the Inland Revenue records was used as a guide to allocate the net decennial migratory flow between quinquennia.

The quinquennial estimates of natural increase and migration for the population aged 20-44 in Lancashire and Cheshire can be found in Table XIX, Appendix III. They are also presented graphically in Figure 12. Table XX, Appendix III contains the I.H.D. series of houses assessed and not assessed to duty in these two counties. Turning now to Figure 12, there is a strong correlation between the long swing in house-building and the curve of population change. The shape of the latter is largely determined by "the swing in the balance of migration."^50

The early 1870's witnessed a very large net inflow of population into South-east Lancashire. This, along with a sharp rise in the marriage rate (see Figure 13) brought about a tremendous increase in the demand for house room, thereby contributing to the major upswing in building activity during this period. Between 1876 and 1880, both the volume of in-migration and the marriage rate fell precipitously. No significant increase in either is apparent before the mid-1890's. This corresponds to a downswing and prolonged depression in residential construction. In the late 1880's, there is a sharp rise in the curve of natural increase. According to Thomas, "the quinquennium 1890-5 saw the powerful echo effect of the sharp increase in the birth-rate twenty-five to thirty years before."\footnote{51} This bulge in the population aged 20-44 facilitated a sharp rise in the marriage rate when economic conditions improved in South-east Lancashire after 1895. To this was added a resurgence of net in-migration which further swelled the demand for housing accommodations. The boom in house-building followed with a lag the upswing in the curve of population. The net outflow of population in the house-seeking age group after 1900

\footnote{51}Ibid.
Figure 13

MARRIAGE AND BIRTH RATES (PER 1000 POPULATION)
ENGLAND AND WALES 1860-1910

and the fall in the level of natural increase eventually brought a contraction in the volume of building activity. This was reinforced by a decline in the marriage rate after 1899.

The evidence appears to indicate that demographic factors were an important part of the mechanism which gave rise to regional long swings in house-building in South-east Lancashire. The behavior of these factors, however, is largely explained by the changing fortunes of the cotton industry. Thus, for example, the prosperity of the cotton trade in the early 1870's (the cause of which was discussed in the last section) drew a tremendous number of young adults to Lancashire. Rising incomes and employment made it easier to marry and establish a separate house-hold, as well as support larger families. In this sense, the upswing in natural increase during the 1890's and the building boom which followed are partially explained by the prosperity of the early 1870's and the inability of France and Prussia to get along.
We have seen that house-building in South-east Lancashire followed closely the national pattern between 1860 and 1900. Was this, however, the typical experience of individual towns throughout the region? In this section we restrict ourselves to addressing this question only. The reason for this is that we have access to even less information on the local demographic and economic history of South-east Lancashire than we did for South Wales. The information that is available will be used, where relevant, to indicate possible local behavioral relationships.

We proceed by partially disaggregating the regional index. Statistical series for eleven major towns included in the regional index will be found in Table XVIII of Appendix III. Those for Ashton-under-Lyne, Bolton, Altrincham, Salford, Oldham, Stockport, Bury and Rochdale are in the form of indices of building activity based on the average number of house plans approved annually between 1901 and 1910 in each town respectively. The data for Burnley, Preston and Manchester are in their raw form. The local records of house plans approved in Manchester between 1869 and 1890
have been lost or destroyed, which accounts for the gap in that series.

The local indices were constructed from raw data on the number of house plans approved annually in each town. Once again, it is important to emphasize the limitations of the data. This was discussed in the last section of the previous chapter as well as in Appendix II, and need not detain us here. In light of these difficulties, however, the series can only be considered rough approximations to the actual course of building activity at the local level. For ease of reference, they have been graphed in Figure 14.

Turning now to Figure 14 one is struck by the diversity of local building patterns. The short run fluctuations of the disaggregated series provide a sharp contrast to the relatively smooth regional curve of house-building in Southeast Lancashire. Our observations on the existence of long swings at the local level in South Wales appear to hold true in the present case as well. Though recognizable in a number of the series, they hardly display with any degree of uniformity, the time shape of the regional or national pattern. On the other hand, one does observe a coincidence of relatively
Figure 14

INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN SOUTH-EAST LANCASHIRE 1860 - 1914

Source: Table XVIII, Appendix III
high levels of construction activity in all of the towns in South-east Lancashire during the mid-1870's and again in the late 1890's.

We have seen that house-building was relatively depressed in the mid-1860's. This was especially true in Bolton and Ashton-under-Lyne. Manchester, however, experienced a minor boom in these years, while Altrincham appears to have fluctuated around a relatively constant level. The regional upswing in the late 1860's primarily reflects the unusual experience of Bolton where a major peak in both housing and industrial building came in 1869. The high level of in-migration swelled the urban labour force and added to the demand for housing accommodation. Between 1861 and 1881, the population of Bolton rose from 70,000 to 105,000, and increase of 50 per cent.\textsuperscript{52}

The 1870's witnessed a tremendous increase in building activity throughout South-east Lancashire. The pause in the regional index in 1871-2 results from minor reversals in Altrincham, Ashton-under-Lyne, Bolton and Oldham. All of the towns for which we have data in this period were experiencing a major boom in residential construction by 1875-6.

\textsuperscript{52}Mitchell, \textit{British Historical Statistics}, pp. 24-25.
The most dramatic increases occurred in Ashton-under-Lyne and Oldham between 1873 and 1877, in Salford from 1872 to 1875, in Bury from 1875 to 1877, and in Rochdale between 1869 and 1875.

In the previous section we discussed briefly the structure of the two main branches of Lancashire cotton industry and the tendency for the weaving or manufacturing branch to experience the prosperity of an upswing before the spinning branch. This may, in part, explain why the building booms in Oldham and Ashton-under-Lyne, which were primarily spinning centers, lagged somewhat the booms in other towns.

The experience of Oldham provides a remarkable example of local participation in the wave of expansion that overtook the cotton industry in the decade of the 'seventies. The growth of profits and dividends in the late 1860's and early 1870's stimulated an upsurge in the formation of joint stock companies. Between 1873 and 1875, 60 companies representing over 3,000,000 spindles and a total nominal capital of 3,517,000 pounds were floated in Oldham. The working

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classes both participated in and promoted this wave of investment.

"Before 1873 the working class was estimated to have owned at least three-quarters of the capital then invested in the local spinning companies ... There were hundreds of people earning well under £2 a week each with hundreds of pounds invested in their local mills. By March, 1874, there could not have been fewer than 10,000 persons holding shares in Oldham."\(^{54}\)

The remarkable growth of Oldham is reflected in her burgeoning population resulting not only from natural increase, but, as we have seen, from the heavy net inflow of population through internal migration. In 1871 her population stood at 83,000; by 1881, this had grown to 111,000, an increase of 34 per cent.\(^{55}\) There can be little question that such a dramatic rise in population was an important factor contributing to the building boom of 1876-7.

The crisis of the late 1870's hit the working classes especially hard, not only because of unemployment and reduced wages, but also because of heavy calls in unpaid-up share capital. Many workers lost their entire invested savings.


Working class savings were subsequently diverted away from the cotton industry to savings banks and building societies. During the depression of the 1880's fewer than 10 per cent of mill workers held shares in local industry. Lewis describes the role working class savings played in the pattern of regional development as follows:

"We thus have the phenomenon of workers saving, investing in their own industry, and drawing high dividends which were usually reinvested. They stimulated not only industrial building, but also house-building, more through migration into the area than through an income elasticity of demand. When capacity and building had been overdone, and they lost both their jobs and their savings, they migrated, or moved together, and left surplus houses. But when better times came they retained their thrifty habits and now facilitated house-building by supplying funds."  

House-building fell off sharply throughout South-east Lancashire during the trade crisis of the late 1870's. The 1880's opened with a building depression in all of the towns for which we have data. As the decade unfolded, however, there was a growing diversity of local house-building experiences. Some towns such as Altrincham and Salford follow closely the regional and national activity in the 1880's and early 1890's, followed by an upswing in 1894-5. This, on the other

56 Lewis, Building Cycles and Britain's Growth, p. 126.
hand, was in sharp contrast to the course of house-building in Bolton, Oldham and Ashton-under-Lyne. In the preceding section we noted the boom in the mule twist trade during the early 1880's. The above towns were the primary centers of this industry, and experienced a wave of investment in spinning mills during these years which was accompanied by an upswing in house-building. Reversals occurred in both Ashton-under-Lyne and Oldham after 1886, while Bolton, after a brief pause in 1886-7, continued to climb to a minor peak in 1890. Between 1891 and 1911, house-building in Bolton fluctuated around a relatively high constant level.

Recovery came early to Rochdale and Stockport with upswings in residential construction getting underway after 1885-6, and leveling off after 1889. Bury on the other hand, experienced a longer period of depression in house-building than any other town in the region, extending from 1878 to 1906. Her population which stood at 99,494 in 1881, remained almost stationary over the entire period, climbing to 102,103 in 1891, 102,687 in 1901 and then declining in the next decade

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to 96,591 in 1911.58

Residential construction was relatively depressed throughout South-east Lancashire in the early 1890's, but as the home boom gained momentum after 1894-5, it drew in all of the towns included in the regional index, with the exception of Stockport, Bury and Bolton. The regional upswing is dominated by the building boom in Manchester, where the number of houses erected annually increased sharply from 687 in 1893 to 2939 in 1899. The towns population rose from 890,622 in 1891 to 1,011,605 in 1901, a growth of 13.6 per cent.59 Major booms also took place in Altinham, whose population rose from 38,603 in 1891 to 43,122 in 1901 (an increase of 11.7 per cent), Ashton-under-Lyne where the increase was from 84,654 to 90,492 (6.9 per cent), Burnley whose population climbed from 87,016 to 97,043 (11.5 per cent) and Rochdale where the increase was slightly lower, from 76,161 to 83,114 (9.1 per cent).60

58 Page, Commerce and Industry, p. 9.
60 Ibid.
The crisis which hit the Lancashire cotton industry at the turn of the century was accompanied by a decline in home consumption, increased unemployment and labour unrest, falling wages and incomes plus the appearance of out-migration in the house-seeking age group. This coincided with a slump in house-building in most of the towns for which we have data. There were, however, significant local differences in timing and duration. Residential construction fell off sharply in Burnley after 1897 and remained in the doldrums until an upswing got underway in 1905. The decline in Salford began in the same year, 1898, leveling off somewhat in the early 1900's, and if the peak in 1908 is considered a random shock, the trend is downward after 1905.

The downswings in Oldham after 1898 and in Rochdale after 1900 are mild compared to the precipitous declines in Burnley and Manchester. A trough occurs in 1905, after which building activity in both towns rises to a minor peak in 1908-9. Altrincham, on the other hand, experiences a long fluctuating boom from 1894 to 1904, falling thereafter until the outbreak of war in 1914. Stockport, in much the same way as Bolton, enjoys relatively high levels of building activity throughout the entire period 1890 to 1912. If the isolated
peak in 1903 for Ashton-under-Lyne is ignored, then the local course of house-building bears a close resemblance to the regional pattern.

The boom in house-building that got underway in most of the towns in South-east Lancashire during the late 1890's differed in a number of ways from the swing of the 1870's. In many cases it was far less intense. The peak year, 1898, in Oldham saw less house-building than the minor boom of the mid-1880's, and was only one-third of the amplitude of the major boom of 1876-7. In Altrincham, on the other hand, the boom of the 1890's overshadowed the long swing in the 1870's, while in Rochdale, their relative magnitudes were about the same. In general, however, the boom of the 1870's was far more dramatic, with the period of exceptionally high building activity spanning only a few years in the middle of the decade. Our data for the 1890's, which includes a number of new towns, displays far more variation in local patterns over the entire period 1890-1910, despite the general tendency toward higher levels of building construction in the late 1890's. This not only has the effect of reducing the intensity of the second regional long swing, but also lengthens its period.

In this chapter we have seen that the course of house-
building in South-east Lancashire resembles closely the national pattern before 1900. May we thus assume that the causal mechanisms giving rise to long swings in residential construction were basically the same at the national and regional level? Our analysis of the economic and demographic development of Lancashire suggests that such an assumption might be misleading. The national mechanism holds that the cessation of foreign investment and emigration which was accompanied by a decline in exports after 1873, released financial capital and labour for home investment. The decline in emigration, primarily from the countryside into the cities, thus increasing the demand for housing accommodation. The relevant question to ask with respect to the experience of South-east Lancashire is whether a regional boom would have taken place in the absence of the international redirection of resources implied by the working of the Atlantic economy. The evidence we have presented in the course of this regional analysis is sufficient to venture a tentative answer to this question.

The late 1860's and early 1870's were years of heavy foreign investment and emigration overseas. At the same time, the balance of internal migration in favor of Lancashire was exceptionally high. Foreign development imposed little if any
restraint on the industrial recovery of the regional economy, and its ability to attract necessary supplies of labour and capital following the raw material and credit crises of the early and mid-1860's. The ebb of external migration after 1873 is accompanied by a decline in internal migration to South-east Lancashire. The evidence suggests that changes in the regional population (the major determinant of housing demand) were positively related to the development of the Lancashire cotton industry, and were not a residual influence of overseas expansion.

The early 1870's was undoubtedly one of the most prosperous periods for the Lancashire cotton trade. A world wide inflation contributed to exceptional profits and dividends. The impact of the Franco-Prussian war, which must be considered an exogenous shock in this context, gave a fillip to this trend. The working class shared in the prosperity through increased earnings and employment. High profits stimulated a wave of investment in mill-building and the increased incomes and growing labour force had a similar influence on house-building.

The market for cotton goods softened somewhat after 1873, yet profits and dividends continued to be declared until mid-1876 and wages of operatives continued to rise until 1877.
The fact that the building boom continued to 1876 is perhaps best explained by the structural reorganization which took place in the regional economy during this period (this is not to dismiss many of the factors discussed in Chapter III, which also played a part). Regional construction was not eclipsed by what in the past had become a traditional credit crisis. The proliferation of joint stock companies and building societies provided a crucial supplement to the existing banking system for the purpose of realizing the savings generated by the expansion of the regional economy. The construction of cotton mills and cottages was by and large financed locally out of the savings of operatives, carpenters, miners and mechanics, among others. There is little question that the decline in foreign investment and the diversion of loanable funds into the domestic economy was an important factor easing credit conditions at home. We are simply suggesting that it was not critical

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61 In 1876 the Economist observed, with respect to the country as a whole that "the greatly demand (for wood) seems to be owing chiefly to the low price of money, and to the inclination on the part of capitalists to prefer investments in substantial property in England to foreign stocks ... As long as money continues cheap, this rate of consumption may be maintained, although it will probably results in building beyond the requirements of the population". The Economist Commercial History and Review, 1877, p. 19, quoted in Lewis, Building Cycles and Britain's Growth, p. 199.
in the mechanism of the regional long swing in South­
east Lancashire. At this stage it is clear that we need
more study of the functions of building societies and
other regional financial relationships before anything
more assertive can be said.
CHAPTER VII

SOME CONCLUSIONS AND THEIR IMPLICATIONS
FOR FURTHER STUDY OF HOUSE-BUILDING
IN VICTORIAN BRITAIN

Long swings in residential construction are found to be a prominent characteristic of the time-path traced by various aggregate measures of house-building activity in Great Britain from 1860 to 1914. In general, these secular fluctuations of approximately twenty years duration have been explained in terms of macro-causal relationships, the most intriguing example of which is found in the hypothesis of an "Atlantic economy".

The peculiar institutional arrangements which characterize the housing market give rise to lagged response patterns in the process by which changes in demand are translated into changes in the supply of housing accommodation. A general analysis of housing market structure suggests that the appropriate level at which to analyze the behavior of residential construction is the regional or local level.¹

¹The emphasis here is on "regional", although a number of specific localities, for example London or Birmingham whose populations exceed those of many well defined regions, require special study.
Two of the reasons given for this were, first, it allows us to identify and assess not only those forces of a national or international character which impinge on the housing market but also those structural and institutional factors of specific local or regional origin which combine to influence the course of house-building activity. Second, there is less chance of specifying causal relationships whose underlying behavioral implications are inconsistent with the level of aggregation.

We have repeatedly emphasized the fundamental local character of the market for housing accommodation. In a very real sense, there is no national housing market. A house standing vacant in Oldham can hardly be considered a substitute for a house demanded in Glasgow. Yet, it is precisely this point which has been overlooked in so many of the studies of house-building activity in Great Britain.

The existence of considerable regional differences in the course of house building renders the burden of generalization very hazardous. The enhanced possibility of drawing seriously misleading conclusions by arguing an aggregates suggests that a more productive approach could be made at the regional level. The present paper as one of the first few steps in this direction lends substantial support to
this opinion.

We have shown that house-building in South Wales fluctuated inversely to that of Great Britain as a whole, especially after 1880. The regional course of residential construction was primarily determined by the long run expansion of the coal mining industry (the latter being a natural response to overseas expansion and the application of a steam technology in transportation around the world) and by fluctuations in the export sector which, through the price-profit mechanism described in Chapter V, determined the industrial disposition and utilization of productive resources. The fact that this expansion was uninterrupted, drawing labour continuously to the coal fields and thereby creating a perpetual housing shortage, helps explain the absence of regional long swings in South Wales.

In contrast to South Wales, house-building in South-east Lancashire followed closely the national pattern from 1860 to 1914. We have seen, however, that the regional course of residential construction was largely determined by forces of local origin and the influence of exogenous shocks. Important factors of a regional or local nature were the growth of limited liability ownership, the proliferation of building societies and, in general, the evolution of a more
"perfect" capital market which provided the necessary facilities for the realization of savings flowing from the increased wages and earnings generated during an upswing in the cotton industry. International influences were primarily in the form of shocks which could hardly be considered endogenous in an international mechanism. The Cotton Famine and its aftermath had a depressing influence on the regional economy and local house-building, while the interruption of production on the Continent occasioned by the Franco-Prussian War gave a sharp boost to the Lancashire cotton trade in the early 1870's. There were also shocks of a primarily domestic origin. The failure of the City of Glasgow Bank, and the rumours which led to a run on building societies in Lancashire were fortuitous events in the present context. Building societies (and there-by, house-building) also suffered from the retaliatory tactics of labour unions in their fight to regain wage cuts. Withdrawals of funds and failure to make payments had a disruptive impact on the market for mortgage credit. These exogenous factors played an important role in the regional course of house-building activity.

On the other hand, there were what might be referred to as endogenous international forces which had a marked influence
on the pattern of regional development, but in a way quite different from that implied by the Atlantic economy hypothesis. For example, the upswing in foreign investment and the expansion of the British export sector in the 1880's coincided with a gradual deterioration of the Lancashire export trade in cotton goods. The regional economy failed to participate in the expansion overseas because rapidly growing cotton textile industries abroad were gaining greater control of their own markets and slowly undermining Lancashire's hegemony in the world cotton trade.

It is possible that there does not exist any real behavioral mechanism to explain the aggregate volume of building activity at the national level. Indeed, the national pattern may be only a statistical creation with no other explanation than, let us suppose, the individual, consistent behavioral relationships giving rise to "real" regional house-building patterns. The national pattern in this case would simply be a sum of the regional experiences with no explanation independent of the individual regional explanations.

If there exists an operative set of macro-causal relationships at the aggregate level, as claimed by Thomas, Cooney,
Cairncross and others, then it should be possible to relate these mechanisms to the local or regional experience. This they have failed to do and it is here that the present paper makes a principle contribution.

We have seen that the causal mechanisms giving rise to the regional pattern of house-building in South Wales are basically consistent with the inter-relationships embodied in the Atlantic economy hypothesis. This, however, was not found to be true of the center of the British cotton industry. The regional experience of South-east Lancashire is explained by causal relationships and exogenous factors which are in direct disagreement with the implied mechanisms of the Atlantic economy.

It has not been the purpose of this study to present a theory of the long swing. Indeed, our conclusions suggest that far more research is required before such an ambitious task could fruitfully be undertaken. Our analysis of house-building in South Wales and South-East Lancashire, incomplete though it may be, indicates that the mechanism of the building cycle not only varied between regions but was far more complex than many students of the long swing have been willing to admit. In the course of this study we have attempted to outline the operative causal relationships behind the regional
patterns of house-building activity in South Wales and South-east Lancashire. They have not been proven to be correct in any formal sense, but rather, rest on our interpretation of historical fact. In this regard, a comment by J. Parry Lewis is especially appropriate:

"This is not to say that historical proof does not exist. It most certainly does. But it needs a far greater expert to recognize it than does a statistical proof; and on occasion the expert must declare that he sees no prospect of proof or disproof, unless some unsuspected data are revealed."  

We have left many stones unturned. This has been the unfortunate consequence of not having access to relevant information as well as being constrained by time. It is clear, however, that far more work needs to be done at the regional level. The present paper hardly provides a balanced approach to the study of regional house-building patterns in all of Great Britain. Other areas in which similar research might be conducted are the worsted and woollen region of Yorkshire (the West Riding), the coalfields of North-east

2Lewis, Building Cycles and Britains Growth, p. 211.
England, the Birmingham conurbation, the Glasgow conurbation and London (including the towns in the outer ring).

We also need to know more about the impact of internal migration and natural increase on the rate of household formation at the regional level. What was the effect of changes in the age and sex distribution of the regional population on the demand for house-space? Another extremely important area where our knowledge is relatively fuzzy concerns the evolution of the building society movement and the role of building societies in a progressively changing capital market. Only when we learn more about these and other factors at the regional level will we be able to perhaps fully understand the mechanism of the long swing.


Hoyt, Homer. *One Hundred Years of Land Values in Chicago.* (Chicago: University of Chicago Press, 1933).


. England's Recent Progress: An Investigation of the Statistics of Migration Morality, etc. in the Twenty Years from 1881 to 1901, as indicating Tendencies Towards the Growth or Decay of Particular Communities and of the Rural Portions of England and Wales. (London: Chapman & Hall Ltd., 1911).


APPENDIX I

The number of towns for which building statistics are available before 1900 gradually decreases to six in 1856. To construct a general index of building activity by combining an increasing number of series it was necessary for Weber to vary appropriately the number of towns in the base period (1900-09). "Thus the houses built in the towns included in, say, 1856 were added up and the sums were expressed as relatives of the average number of houses erected in the same towns in the base period. As further towns were added, the average for 1900-09 was correspondingly raised by the average amount of building in the added towns."¹

London presented a number of interesting problems. The course of house-building in the metropolis often varied considerably from that in other regions of Great Britain. Consequently, when it was included in the index as described above, it tended to have an exaggerated influence on the trend in building activity. To avoid this problem, a general index based on thirty-three towns, excluding London, was

constructed and used to estimate the actual number of houses built in Great Britain not including London. The official statistics of all houses built in Great Britain from 1924 to 1937 minus the houses constructed in London were used as a base to construct these estimates.

Data on house-building in the following towns were used to construct Weber's Index of Residential construction in Great Britain.²

The index of houses under construction in England and Wales on Census day (Column 4 in Table XVI) has been plotted in Figure 15. This evidence is in rough agreement with that provided by Weber's Index of building activity. Available data from the Census of Population in Scotland was excluded from Table XVI because of a change in the definition of a house in 1881 that precludes comparability in previous years.

²Ibid., p. 129.
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<td>Wolverhampton</td>
<td>1861-69, 1877-84, and 1887-1923</td>
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<td>Weighted Index</td>
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TABLE XV - Continued (2)

NATIONAL INDICES OF BUILDING ACTIVITY IN
GREAT BRITAIN, 1860-14

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<th>CAIRNCROSS New Houses Built (000's)</th>
<th>Inhabited House Duty Statistics Volume of Residential Building 1907=100</th>
<th>Net Increase in Housing-Stock (000's)</th>
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TABLE XV - Continued (3)

NATIONAL INDICES OF BUILDING ACTIVITY IN GREAT BRITAIN, 1860-1914

| Year | WEBER New Houses Built (000's) | WEBER Building Index 1900-09=100 | WEBER Weighted Index 1901-10=100 | LEWIS New Houses Built (000's) | LEWIS Volume of Residential Building 1907=100 | CAIRNCROSS New Houses Built (000's) | CAIRNCROSS Volume of Residential Building 1907=100 | Inhabited House Duty Statistics
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(6) J. Stamp, British Incomes and Property,(London: P.S. King and Son,Ltd,1927)
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<th>Year</th>
<th>Col. (1) Housing Stock (000's)</th>
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<th>Col. (3) Houses Under Construction on Census Day</th>
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Figure 15

HOUSE-BUILDING IN GREAT BRITAIN ANNUALLY AND IN ENGLAND AND WALES ON CENSUS DAY 1860 - 1911

(A). Weber index of house-building in thirty-four towns, 1860-1914, 1900-09=100.

(B) Number (in thousands) of houses erected in Great Britain 1860-1914.

(+) Index of houses under construction in England and Wales on Census Day, 1861-1911, 1901=100.
APPENDIX II

The regional index of residential construction in South Wales constructed by Lewis is based primarily on raw data series of house plans approved. It was necessary to make a number of adjustments so that these series could be transformed into estimates of actual houses erected. Two important problems were to determine the percentage of house plans approved that were never realized and the time-lag between plan approval and actual construction. Extensive examination of those local registers where all the relevant details were recorded led Lewis to conclude that 85 percent of the houses planned were eventually built and there intervened generally a period of six months from the time a plan was approved until actual construction began.

To adjust for municipal boundary changes it was assumed that if the population increased from $X_1$ to $X_2$ as a result of the change, then the number of houses that would have been built in the enlarged area before the change was made would have been approximately the number for the smaller area multiplied by $X_2/X_1$. This is, of course, a very naive adjustment, prone to overestimation in some cases and underestimation in others. In an attempt to avoid such results Lewis studied old maps where available and existing population data to get some idea of the time-pattern of development in the annexed region.
before it was absorbed. Where appropriate, the multiplicative factor $X_2/X_1$ was modified by a time coefficient $t$, which in most cases increased from $X_1/X_2$ to unity. The actual adjustment depended upon a detailed study of each locality. Thus, a series showing the "actual" course of house-building in the area of the most recent boundary change was constructed for each town in South Wales.

From these individual local series the regional index was produced in the following manner.

"First an index for two towns covering the period 1852-1913 was derived, based on 1901-10=100. Then an index for four towns, consisting of the previous two plus two others, was computed for 1856-1913, based on activity in these towns during 1901-10. In 1856 the value of the two-town index was 73.1 while the value of the four town index was 81.6. To obtain a single index for the period from 1852 based on the maximum amount of data these two indices were spliced by multiplying the first three years of the two-town index by 81.6/73.1. This procedure was continued whenever a new town appeared in the index."  

This method of aggregation has the advantage of avoiding the discrete jumps in the series resulting from the addition of

new towns to the index. On the other hand, such additions tend to result in a smoothing out and lowering of the former series. This may obscure significant interregional differences that are apparent only at the local level.

The following table contains the raw data series of house plans approved for 16 towns in the South Wales coalfield. The South Wales regional house-building index is also presented in column one.
### TABLE XVII

**HOUSE-BUILDING DATA FOR SELECTED TOWNS IN SOUTH WALES**  
(Numbers of House Plans Approved)

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<th>Year</th>
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<th>(C) 83</th>
<th>(D) 20</th>
<th>(E) 153</th>
<th>(F) 131</th>
<th>(G) 20</th>
<th>(H) 553</th>
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<td>Cardiff</td>
<td>Newport</td>
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(B), (C), (D), (E), (F), Hamish Richards and J. Parry Lewis, "House-Building in the South Wales Coalfield, 1851-1913", *Manchester School*, Vol. XXIV, (September, 1956), pp. 297-298.

(G), (H), (I), (J), (K), (L), (M), (N), (O), (P), (Q), J. Parry Lewis, *Building Cycles and Britains Growth*, (London: MacMillan & Co., Ltd., 1965), pp. 308-311.
APPENDIX III
## TABLE XVIII

INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN SOUTH-EAST LANCASHIRE 1860-1913
(1901-10=100)

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TABLE XVIII - Continued (4)

INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN SOUTHEAST LANCASHIRE 1860-1913
(1901-10=100)

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<th>Manchester (No. of Houses Erected)</th>
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TABLE XVIII - Continued (5)

INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN
SOUTH-EAST LANCASHIRE 1860-1913
(1901-10=100)

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<th>Preston (No. of House Plans Approved)</th>
<th>Manchester (No. of Houses Erected)</th>
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TABLE XVIII - Continued (6)

INDICES OF HOUSE-BUILDING FOR SELECTED TOWNS IN
SOUTH-EAST LANCASHIRE 1860-1913
(1901-10=100)

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<th>Burnley (No. of House Plans Approved)</th>
<th>Preston (No. of House Plans Approved)</th>
<th>Manchester (No. of Houses Erected)</th>
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### TABLE XIX

**NATURAL INCREASE AND MIGRATION POPULATION AGED 20-44**  
**1870 - 1910**  
**LANCASHIRE AND CHESTER**

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<th>1886-1890</th>
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TABLE XX

TOTAL NUMBER OF HOUSES ASSESSED AND NOT ASSESSED TO DUTY
(Thousands)

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Source: Brinley Thomas, "Demographic Determinants of British and American Building Cycles, 1870-1913", p. 37