Edited by

Alan Griffiths & Stuart Wall

APPLIED ECONOMICS

AN INTRODUCTORY COURSE

SIXTH EDITION

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PREFACE

As any teacher or student of economics well knows, the vitality of the subject depends largely upon a continual synthesis of theory with observation, and observation with theory. Unfortunately this exercise is costly in terms of the time and the effort involved in finding sources, in assembling and interpreting data, and in searching journals and periodicals for informed comment on contemporary events. That the exercise is, however, ultimately worth while, is eloquently expressed by Professor James Meade in the following quotation taken, with his permission, from a letter to the authors:

> The great tradition of Political Economy in this country is the application of basic economic analysis to the central economic problems of the time. For this purpose students must have a knowledge of institutions and quantitative relationships over a very wide range of sectors of the economy; and this instruction about the facts must be accompanied with guidance about methods of applying economic theory to the problems which arise over a very wide range of topics. Guidebooks to the UK economy which combine information and analysis in this way are all too rare; and the authors are to be highly commended for undertaking a comprehensive survey of this kind.

Our hope is that *Applied Economics* will take the reader some distance along this route, by combining information with analysis over twenty-nine separate topic areas. The book also examines in detail the major economic issues arising within each topic area. These are of interest in their own right and, more pragmatically, often form the substance of examination questions. Although the focus of *Applied Economics* is the UK, extensive reference is made throughout to the experience of the other advanced industrialized countries, helping the reader place any observations on the UK in a broader international context.

Each chapter concentrates on a particular topic area and begins with a synopsis, setting out the issues to be investigated, and ends with a conclusion, reviewing the major findings. The largely self-contained nature of each chapter gives the book a useful degree of flexibility. For instance chapters can be read selectively, in any order appropriate to the reader's interest or to the stage reached in a programme of study. This may be helpful to the reader as courses rarely follow the same sequence of topics. On the other hand the topics have been arranged with an element of progression, so that the reader may begin at Chapter 1 and read the chapters consecutively. The book then takes the form of a 'course' in applied economics.

Applied Economics is designed for undergraduate students in the first and second years of degree courses in economics, the social sciences and business studies, and for those taking professional courses with an economic content. The material will also be useful to many involved in Higher and National Diplomas and Certificates of the BTEC, and to the serious A level student. Much of the content begins at an introductory level and is suitable to those with little or no previous exposure to economics, although the diverse nature of the various topic areas inevitably means some variation in the level of analysis, and indeed in the balance between information and analysis. Overall, the book is best read in conjunction with a good introductory text on economic theory.

We are indebted to many individuals for help during the course of this project. The major debt is, however, clearly owed to those who contributed the various chapters, and this is acknowledged more fully at the end of the book. Thanks are also due to Professor James Meade and Dr Paul Stoneman for help on particular aspects of the manuscript. We would also like to thank Olga Peppercorn, Librarian at the Department of Applied Economics, Cambridge University, for access to a wide range of empirical sources, and Fred Chambers, formerly Head Librarian at Anglia Polytechnic University (APU), for much helpful direction. For typing the various drafts of the manuscript, our thanks go to Jenny Connor, ably assisted by Margaret Nichols and Barbara Mornin. Finally, for patience and forbearance during many months of absence from normal family activities, our thanks go to Sylvia and Eleanor. Of course any errors and omissions are entirely our responsibility.

We were delighted that the first five editions of *Applied Economics* were so well received by teachers and students across a wide range of courses. Our intention is to keep the book at the forefront of economic debate and events. Accordingly, in this sixth edition we have thoroughly updated all the data and empirical material and added new economic analysis where appropriate, including a new chapter on the economics of social problems and additional material on trading blocs and EU related issues.

Alan Griffiths, Stuart Wall. Cambridge 1995

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CONTENTS

1 CHANGES IN THE UK ECONOMIC STRUCTURE

In this chapter we review the changing economic structure of the UK, particularly the declining significance of industrial output and employment as compared with the service sector. Some comparisons are made with international experience. Alternative explanations of industrial decline are examined, such as economic 'maturity', low-wage competition, the advent of North Sea oil, 'crowding out' by the non-market public sector and low UK productivity *vis-à-vis* its competitors. We consider whether the changes observed in the UK are a cause for concern, or merely a reflection of changes experienced in other advanced industrialized countries.

The popular view of the UK as an industrial economy, a manufacturing nation, is now inaccurate. Over the past thirty years the structure of the economy has been transformed. Manufacturing now contributes only 20% of total output and employs some 4.5 million fewer people than in 1964. One of the most prominent of today's industries, North Sea oil and gas, did not even exist twenty-five years ago, and service activities have now outstripped the industrial and manufacturing sectors, both in terms of output and employment. There are even suggestions that the UK is becoming a 'post-industrial' economy, i.e. one in which information-handling activities are predominant. We shall consider the causes and consequences of these changes, and in so doing point out that structural change has implications for other important economic issues.

Structure defined

An economy may be analysed in terms of its component parts, often called 'sectors'. Sectors may be widely drawn to include groups of industries (e.g. the engineering industries) or narrowly drawn to identify parts of industries (e.g. fuel-injection equipment), depending on our purpose. Structural change is often discussed in terms of the even more widely drawn 'primary', 'secondary' and 'tertiary' (service) sectors. It will be useful at the outset to define these, and other conventional sector headings: (a) *the primary sector* – includes activities directly related to natural resources, e.g. farming, mining and oil extraction; (b) *the secondary sector* – covers all the other goods production in the economy, including the processing of materials produced by the primary sector. Manufacturing is the main element in this sector which also includes construction and the public utility industries of gas, water and electricity; (c) *the tertiary sector* – includes all the private sector services, e.g. distribution, insurance, banking and finance, and all the public sector services, such as health and defence; (d) *the goods sector* – the primary and secondary sectors combined; and (e) *the production industries* – includes the entire secondary sector except construction, together with the coal and coke industries and the extraction of mineral oil and natural gas. There is an index of industrial production on this basis, and the term 'industry' usually refers to this sector heading.

Structural change means change in the relative size of the sectors, however defined. We may judge size by output (contribution to Gross Domestic Product

(GDP)),[1] or by inputs used, either capital or labour. Usually more attention is paid to labour because of the interest in employment and also because it is more easily measured than capital.

Through time we should *expect* the structure of an economy to change. The pattern of demand for a country's products will change with variations in income or taste, affecting in turn both output and employment. If economic growth occurs and real incomes rise, then the demand for goods and services with high and positive income will tend to increase relative to those with low or even negative income elasticities[2]. For example, between 1983 and 1993 total real consumer expenditure at 1990 prices rose by 33.5%, but expenditure on goods and services classified as 'recreation, entertainment and education' increased by 55%, whilst expenditure on 'food' increased by only 11.3%. Within the 'recreation, entertainment and education' category, consumer tastes favoured 'radio, TV and other durable goods', where real spending increased by 176%; by contrast spending on 'newspapers and magazines' rose by only 2.7% in real terms. These changes have clear implications for the pattern of output and employment.

The pattern of demand is also responsive to changes in the age structure of the population. The UK, like other developed countries, is experiencing important demographic changes which mean that by 1996 there will be 1.68 million fewer people in the 16–24 year old age group than in 1981. So, for example, the 'recreation, entertainment and education' sector may find this a constraint on its growth, unless it can adapt to the changing characteristics of the market. This smaller age cohort will form fewer new households than previous cohorts, so reducing demand for housing, furniture and consumer durables below what it would otherwise have been. In the longer term, a further demographic factor will be the continuing rise in the numbers of people aged over 75, who will place increasingly heavy demands on the medical and care services.

It is not only the demand side which initiates structural change. The reduced supply of young people in the labour market in the early 1990s increased their earnings relative to other workers, which encouraged firms such as supermarkets to recruit older workers. Employers may also respond by substituting capital for labour and so changing employment patterns, or by raising product prices which would reduce the growth of output and in turn influence employment.

Also on the supply side, technical progress makes possible entirely new goods and services, as well as new processes for producing existing goods and services. In Chapter 20 we note that microelectronics not only gives us new products, such as word processors and video games, but also reduces costs of production, whether through the introduction of robotics in manufacturing, or computerized accounting methods in banking services. Where such 'process innovation' raises total factor productivity, unit costs fall. The supply side is therefore itself initiating new patterns of demand, output and employment, by creating new products or by reducing the prices of existing products and raising quality.

Changes in resource availability may also initiate structural change, as happened so dramatically with oil in 1973 and again in 1979. When the oil-producing and exporting countries (OPEC) restricted world output, oil-based products rose sharply in price, with *direct* consequences for substitutes (e.g. coal and gas) and complements (e.g. cars). In response to higher oil prices not only did the demand for substitutes rise, and for complements fall, but decisions had also to be taken throughout the economy, by both producers and consumers, to use less energy. As a result there was a decline in output and employment in energy-intensive industries, a prime example being steel.

Oil has had further *indirect* effects on the structure of the UK economy by means of the exchange rate. The development of North Sea oil production enabled the UK to be self-sufficient in oil by 1980, but also bestowed 'petro-currency' status on the pound. This meant that the sterling exchange rate was now responsive to changes in oil prices, which between 1979 and 1983 tended to keep the pound higher than would otherwise have been the case. The result was to make UK exports dearer and imports cheaper in the early 1980s, with adverse consequences for output and employment in sectors facing international competition, both abroad and at home. During 1986 this was partially reversed. The oil price halved and sterling fell 9.2% (on average), providing a stimulus to industrial output during 1987. Although by 1990 the UK was not much more than self-sufficient in oil, the pound still behaved as a petro-currency during the Gulf crisis. Following the invasion of Kuwait by Iraq, and the consequent rise in the oil price, the pound appreciated by just over 6% during July and August 1990. Although oil is still of considerable importance to the UK economy, its declining role can be gauged from the fact that the UK visible surplus in its oil trade has fallen from a peak of £8,163 million in 1985 to only £2,462 million in 1993.

International competition is a potent force for change in the economic structure of the UK. Changing consumer tastes, the creation of new products and changing comparative costs result in the redistribution of economic activity around the world. The demise of the UK motorcycle industry in the face of Japanese competition, for example, was the result of UK manufacturers failing to meet consumer demand for lighter, more reliable, motorcycles which Japan could produce more cheaply. As we see in Chapter 25, for most products the major impact on UK output and employment has come not from Japanese producers, but from those EU countries which, unlike Japan, have unrestricted access to the UK market. Membership of the EU inevitably meant accepting some restructuring of the UK economy, in accordance with European comparative advantages. This is certainly true for industrial production, with the EU a protected free trade area, though less true for agriculture (see Chapter 28).

Decisions on the location of industrial production are increasingly taken by *multinational enterprises*. In the UK motor industry, decisions taken by Ford and General Motors during the 1970s and early 1980s to supply more of the European market from other EU plants, contributed to the fall in UK car output from 1.3 million in 1977 to 1.1 million in 1987, despite real consumer spending on cars and vehicles more than doubling in that period. On the other hand by 1996 the UK should increase its car output by half a million cars per year, if the plans of Nissan, Toyota, Honda and Peugeot-Citroen materialize.

Structural change in the UK

The data we shall use to trace changes in the UK economic structure are contained in Tables 1.1, 1.2 and 1.4. The choice of the years in these tables is not arbitrary; 1964, 1969, 1973, 1979 and 1990 are the peaks of successive business cycles. By using these years we shall be comparing like with like. Some activities, e.g. construction, show much more fluctuation in output and employment during the course of a trade cycle than do others, e.g. the public sector services. We must therefore compare years which have similar economic conditions if we are to avoid reaching wrong conclusions. It is, however, interesting to observe the way the recession of the early 1980s affected the different sectors, so data are provided for 1981. 1993 is also included as the latest year for which complete data are available. Following falls in the volume of output in 1991 and 1992, 1993 appears to be the start of another upswing in the business cycle.

Changes in output

Table 1.1 presents index numbers of output at constant factor cost,[3] recording changes in the volume of output for the various sectors. Data for GDP at factor cost is also given so that comparisons can be made between the individual sectors and the economy as a whole.

Table 1.1 **Index numbers of output at constant factor cost. 1990 = 100.**

	1964	1969	1973	1979	1981	1990	1993
PRIMARY							
Agriculture, hunting, forestry and fishing	55.0	59.0	69.5	71.3	81.2	100	103.5
Mining and quarrying	187.0	136.1	104.3	109.2	115.7	100	115.0
Coal and coke	295.0	213.2	166.1	144.4	143.8	100	81.2
Oil and gas extraction	–	–	–	88.8	99.2	100	127.4
SECONDARY							
Manufacturing	72.6	85.4	94.6	90.6	77.7	100	95.3
Construction	65.9	74.4	77.4	69.4	60.5	100	87.2
Electricity, gas and water supply	45.3	55.1	69.6	80.4	81.9	100	109.9
TERTIARY							
Distribution, hotels and catering, repairs	61.0	65.5	76.0	76.6	69.9	100	99.2
Transport and storage	60.2	66.7	79.3	81.5	77.9	100	101.6
Post and telecommunication	30.6	40.2	50.2	59.7	62.7	100	106.3
Financial, intermediation, real estate, renting and business activities	27.6	34.5	42.3	49.6	54.3	100	98.3
Ownership of dwellings	63.3	73.3	79.8	90.8	92.6	100	102.8
Public administration, national defence and social security	85.1	89.1	98.0	98.0	102.2	100	100.2
Education, health and social work	57.9	67.2	76.5	92.4	94.2	100	101.7
Other services	51.8	54.7	59.0	68.3	70.5	100	107.3
GDP	58.7	66.4	74.9	80.0	76.5	100	99.4
Production industries	62.6	73.3	81.4	87.6	78.9	100	97.9

Sources: CSO (1983, 1987 and 1994).

In the **primary sector**, agriculture, hunting, forestry and fishing grew at a rate of 1.8% per annum between 1964 and 1979, rising to a remarkable 6.5% per annum between 1979 and 1984, stimulated by EU policies and unaffected by the recession. Since then agricultural output declined by almost 5% in the four years to 1988 before renewing its growth path at around 2% per annum between 1988 and 1993, despite economic recession. Clearly the sector has been more influenced by the agricultural policy of the European Union than by the rate of growth of the UK economy. Within mining and quarrying there are two very contrasting industries; coal, which is the only industry where output has fallen throughout the period, and the oil and gas extraction industry which grew very rapidly in the late 1970s and early 1980s. Coal output fell by just over half between 1964 and 1979. High real energy prices after the 1973 and 1979 oil price 'shocks' improved the prospects of the coal industry, but at the same time made feasible rapid exploitation of high cost North Sea oil which was increasingly to act as a substitute for coal. Coal output fell by around 30% between 1979 and 1990 and then by almost a further 20% between 1990 and 1993 as the privatised electricity generating companies made their 'dash for gas'. Oil and gas extraction had peaked at an index number of 137 in 1987 before falling to the 100 in 1990 shown in the table (the halving of the oil price in 1986 may have been a factor in this decline). However renewed vigour in substituting oil and gas for coal in electricity generation in the early 1990s led to a dramatic rise of around 28% in oil and gas extraction between 1990 and 1993.

In the **secondary sector**, 1973 is again a significant date. Output from both manufacturing and construction rose steadily between 1964 and 1973 (at annual rates of 2.9 and 1.8% respectively), but between 1973 and 1979 output from both these sub-sectors actually fell, and fell still more sharply in the recession between 1979 and 1981. *Manufacturing* output fell by as much as 12.9 points or 14.2% in this recession. The recovery after 1981 took manufacturing output to a new peak by 1990 which was just 5.4 points above the previous peak seventeen years earlier in 1973. All of that gain in output was then lost in the recessionary years of 1991 and 1992, before a slight upturn in 1993.

Output in the *construction* industry follows a similar path to that in manufacturing up to 1981. The industry was a leading sector in the boom of the eighties, far outstripping manufacturing, with growth of almost 40 points or 66% between 1981 and 1990 (i.e. 5.7% per annum). Output of the industry then fell almost 13% between 1990 and 1993. *Electricity, gas and water supply* shows none of the volatility of construction. The long run growth of output in this sector tends to exceed that of GDP and does not become negative during recessions; indeed the sector rebounded more strongly after 1992 than any other except oil and gas extraction.

The index of output for the *production industries* (see earlier definition), is presented in the last row of Table 1.1. We see that industrial production grew between 1964 and 1973 by 18.8 points, an annual rate of 2.9%, but then grew more slowly between 1973 and 1979, and fell sharply between 1979 and 1981. This definition includes the contribution of North Sea oil and gas, which helped to compensate for the sharp decline of output in manufacturing since 1973. Exploitation of a non-renewable natural resource is, however, more akin to the consumption of capital than it is to the production of goods and services. The North Sea is providing the UK with a once-and-for-all 'windfall' gain in output over other less fortunate countries. To some extent this masked the full extent of the decline in *non-oil industrial output* which fell by 14.6% between 1973 and 1981, resulting in *non-oil GDP* being 2.5% lower in 1981 than in 1973.

After 1981, growth of UK industrial output resumed, led by the recovery of manufacturing output, and averaged 2.9% per year through to 1988. Industrial output in the 1980s was again growing at the rates of the 1960s, and changing oil output did not significantly affect the index. Industrial production then fell back under the impact of recession, falling 4.1 points between 1990 and 1992 before recovering 2 points in 1993.

International comparisons highlight the failure of British industry during the 1960s and 1970s. Industrial production in the industrial market economies (OECD) grew at a weighted average of 6.2% per annum between 1960 and 1970, slowing to what in the UK would still have been regarded as a healthy 2.3% per annum between