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CSO Wholesale price index Principles and procedures

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WHOLESALE PRICE INDEX
PRINCIPLES AND PROCEDURES

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CORRECTIONS

Page 18 Paragraph A2, third line
delete 'this' **insert** 'the'

Page 19 Paragraphs A7 and A8, formulae 6,7 and 8
insert rule between numerator and denominator in line with 100 x

Page 21 Paragraph A20, formulae 13 and 14
substitute formulae given below

$$100 \times \frac{\sum_{j}^{n^1(c)} \sum_{i}^{n^1(q)_j} Q_{(b)ij} P_{(c)ij}}{\sum_{j}^{n^1(c)} \sum_{i}^{n^1(q)_j} Q_{(b)ij} P_{(b)ij}} \qquad (13)$$

$$100 \times \frac{\sum_{m}^{n^5(o)} \sum_{l}^{n^5(m)_m} \sum_{k}^{n^5(p)_l} \cdots\cdots \sum_{j}^{n^5(c)_k} \sum_{i}^{n^5(q)_j} Q_{(b)ijklm} P_{(c)ijklm}}{\sum_{m}^{n^5(o)} \sum_{l}^{n^5(m)_m} \sum_{k}^{n^5(p)_l} \cdots\cdots \sum_{j}^{n^5(c)_k} \sum_{i}^{n^5(q)_j} Q_{(b)ijklm} P_{(b)ijklm}} \qquad (14)$$

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Page 22 Paragraph A27, formula 15
substitute formula given below

$$100 \times \frac{\sum_{k}^{n(p)} \frac{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ijk} P_{(c)ijk}}{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ijk} P_{(b)ijk}} \times \sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b+1)ijk} P_{(b+1)ijk}}{\sum_{k}^{n(p)} \sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b+1)ijk} P_{(b+1)ijk}} \qquad (15)$$

Page 23 Paragraph A29, formulae 18 and 19
formula 18
delete $P_{(b)}$ in denominator **insert** $P_{(b)}$
formula 19
substitute formula given below

$$100 \times \sum \frac{P_{(l)}}{P_{(b)}} W_{(b)} \times \frac{\sum \frac{P_{(c)}}{P_{(b)}} W_{(b+1)}}{\sum \frac{P_{(l)}}{P_{(b)}} W_{(b+1)}} \qquad (19)$$

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Wholesale price index
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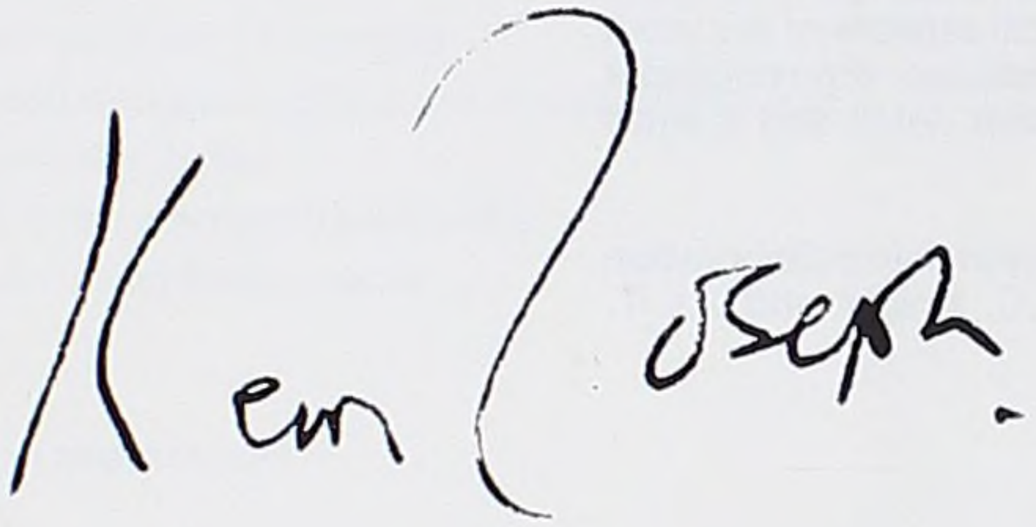
FOREWORD

Wholesale price index numbers have been compiled for many years by the Department of Industry, and its predecessor Departments. They are used for measuring changes in the prices of goods bought and sold by manufacturing industry; for deflating value series to measure both output and expenditure at constant prices; and for contract price adjustment purposes. More recently, they have been used for compiling price index numbers suitable for current cost accounting purposes. They are one of the most widely used official statistics by both the Government and the business community alike.

This study provides for the first time a full description of the wholesale price index numbers. It fills an important gap in the statistical literature.

The price quotations on which the index numbers are based are provided voluntarily by a large number of firms. The wholesale price index numbers are dependent as much on this voluntary co-operation as on the skill of the Department's Statisticians who compile the data. I am pleased to acknowledge them both.



Sir Keith Joseph
Secretary of State for Industry

INTRODUCTION

This publication describes the wholesale price index, which is one of the primary indicators of price movements in the United Kingdom.

The users of the wholesale price index and related indices are many and varied. An econometrician needs them as input to an econometric model; a contracts manager in a construction company uses them in a price adjustment clause of a building contract; an accountant needs them to adjust the value of the company's stocks and fixed capital assets to current replacement cost; the government statistician uses them to revalue expenditure series to constant prices. This study explains how the indices which meet these various needs are compiled.

The first two chapters discuss the broad concepts and the general principles upon which the index is based; Chapter 3 deals with the principles underlying the weighting of the index and the updating procedures; Chapters 4 and 5 are concerned with the practical problems which arise in compiling the index and Chapter 6 discusses publication. These main chapters are written in general with the non-specialist in mind and confine themselves to a broad description of the work. The appendices go into more detail; the first three discuss technical aspects of the work and are aimed primarily at the statistician; the remainder are concerned mainly with illustrative detail and a small glossary is provided.

This study was written by F.A. Fitzpatrick in collaboration with M. Neifield, R.A.R. Ward, T.C. Knight and J.L.T. Denman.

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September 1980

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CHAPTER 1

PURPOSE OF THE WHOLESALE PRICE INDEX

History

1.1 The history of the wholesale price index (WPI) in this country was given in a paper read to the Royal Statistical Society in 1951 by Mr J. Stafford of the Board of Trade*[1]. The first official United Kingdom wholesale price index was prepared by the Board of Trade and published in 1903 in a parliamentary paper on Wholesale and Retail Prices. The series covered the years 1871 to 1902 (with 1871 = 100) and was based upon forty five commodities, mainly basic materials and foodstuffs. The prices were largely derived from the trade accounts and the weights used to combine the price relatives were estimated values of the different commodities consumed, or used, in the country in the years 1881-1890. This index continued until 1921 when a new one was set up, first using weights derived from the results of the first Census of Production in 1907 and being reweighted in 1935 in accordance with the 1930 Census figures. The main interest in these early series seems to have been centred on the aggregate index rather than on the components. As explained in a paper to the Royal Statistical Society in 1921[2], the index was designed to answer the question, 'What is the average change in the value of money relative to other things'. It was thought possible to answer this question by means of a weighted mean of the price movements of a large number of commodities.

1.2 This limited approach was no longer considered satisfactory when the wholesale price index was next reviewed in the 1950s, and a new approach was adopted. The objective changed from one of deriving an index primarily focussed upon the manufacturing sector as a whole to one of producing a family of index numbers for smaller industrial sectors, each of which would be helpful to government and industry in providing comparisons between different sectors, and between sectors and the aggregate index. In addition the nature of the basic data changed: instead of relying largely upon published quotations and prices derived from official sources, a system was devised based upon individual price quotations supplied voluntarily by manufacturers. This new index, or family of indices, was first published in 1958, starting from 1954, with weights derived from the 1948 Census of Production, although it was soon rebased to incorporate the results of the 1954 Census. Subsequent rebasings have taken place when the requisite sales and purchases data have been available and are likely to continue at five-yearly intervals. The concept and system adopted in the 1950s was also described in a Royal Statistical Society paper[3]. It has remained virtually unchanged ever since, although the number of constituent indices has greatly increased over the years, reflecting the degree of interest shown by government and industry as the level of inflation in the economy has grown.

* The number corresponds to a list of references on page 17.

Aims and purpose

1.3 The name 'wholesale price index' is rather misleading. It was used originally to denote bulk selling prices as opposed to prices at the retail stage, but it is often taken now, mistakenly, to refer to wholesalers' selling prices. The indices are in fact focussed upon earlier stages of the economic process. The output price indices are indicators of changes in the prices charged by manufacturers for goods as they leave the factory gate. The input price indices measure changes in the prices of fuel and of materials bought by manufacturers for processing. Although the title of the index is a misnomer it has not been changed, partly because of its familiarity to users, and partly because of the lack of an entirely suitable alternative. The United Nations Statistical Office and other international statistical agencies are using the title 'producer price index' and it is likely that the United Kingdom wholesale price index will be changed at some convenient moment to conform to international nomenclature.

1.4 The wholesale price index and the constituent indices are among the most hard-worked of government statistics, being used extensively within government and the private sector for four main purposes:

i The index at the aggregate level of 'all manufacturing' is no longer considered to have the value attributed to it in the earlier series but it still serves a useful purpose as a general indicator of the price trends at important stages in the economic process. The input index represents one of the factors affecting manufacturers' prices and the output index is used as a guide to prices of goods offered to final buyers e.g. consumer goods appearing in the index of retail prices (RPI).

ii At lower levels of aggregation a wide range of indices are used as a means of adjusting value figures to constant prices. For example, many parts of the index of industrial production are derived with the aid of the constituent indices mainly at the Minimum List Heading (MLH) level; indices for specific products are used to revalue capital expenditure and manufacturers' and wholesalers' stocks, for incorporation into constant price estimates of gross domestic product.

iii Many indices are used in both public and private sectors for contract price adjustment. The indices may be used alone or in combination with others e.g. earnings indices, in order to correspond more closely to a total input index.

iv In recent years the need of the accountancy profession for a simple means of adjusting the book values of a company's fixed assets and stocks from historical cost to current replacement cost has led to the regular publication of a range of suitable price indices in *Price index numbers for Current Cost Accounting* (PINCCA). Most of the indices in this publication are derived from the family of wholesale price indices.

CHAPTER 2

GENERAL OUTLINE OF THE SYSTEM

Industrial structure

2.1 The aim of the WPI system has been described in paragraph 1.3 as the provision of indicators of changes in prices of goods purchased and sold by United Kingdom manufacturers. The number of contributors and amount of data fluctuates in accordance with changing priorities. At the beginning of 1980 the inquiry included about 2,500 manufacturers providing about 11,000 price quotations each month to serve as the basis of these indicators of changes in prices. In order to give coherence and structure to this large number of pieces of data a unifying framework is needed. For many years now the unifying framework for most of the WPI has been the Standard Industrial Classification (SIC). (Imports are the exception to this statement as they are arranged in accordance with the Standard International Trade Classification.) If an establishment has been classified to the manufacturing sector (Orders III—XIX of the 1968 SIC) it is part of the population from which the sample is drawn for the output indices; if an establishment manufactures products which are purchased for further processing by establishments classified to the manufacturing sector, then that former establishment forms part of the population of interest for the input indices. Having defined the populations concerned, the SIC also provides the detailed structure whereby the 11,000 individual price quotations are combined to obtain input and output indices at various levels of aggregation.

2.2 Each sector within manufacturing is defined by a set of principal products and they are, as the name suggests, the products principally manufactured by establishments classified to that sector. The industry, i.e. the group of establishments classified to that sector, and the set of principal products are not however coterminous: the establishments may manufacture products which are the principal products of another sector of industry. As an example the input/output tables for 1970 show that about 6 per cent of the principal products of the insulated wires and cables sector were manufactured by establishments classified to other sectors and, conversely, about 25 per cent of total production of the establishments classified to the insulated wires and cables sector consisted of principal products of other sectors. This lack of complete congruence between the sector and its principal products has been ignored in setting up the structure of indices for the WPI. The output index for a MLH, or an Order, is an index for the principal products of that MLH or Order. This lack of congruence varies between sectors but it diminishes in importance at higher levels of aggregation and virtually disappears at the 'all manufacturing' level.

2.3 The input indices correspond to the first stage in the manufacturing process, the purchase of materials and fuel by establishments classified to the 'all manufacturing' sector. Input price indices for each sector are produced by combining the price quotations for the appropriate group of products in accordance with the value of purchases made by that sector in the base or reference year. The input indices, unlike the output indices, are industry-based, i.e the weights used to combine the price quotations are based upon purchases made by those establishments which are classified to the sector concerned in the SIC. Many of the inputs to sectors within manufacturing are produced by other sectors of manufacturing so, although an input price is defined slightly differently from an output price (see paragraph 4.4) the same price quotation is often used for both purposes. Some purchases are made from outside the manufacturing sector (mining and quarrying, electricity, gas) and from abroad. Data are therefore collected from those other sectors of United Kingdom industry and for imports.

Structure of wholesale price indices

2.4 The WPIs rest upon the 'basket of goods' concept. Each month the same fixed set of products is priced and the total cost so obtained is divided by the average cost of the same 'basket' in a 'reference' year thus producing a ratio. This ratio is then multiplied by 100 to form a 'price index number' (which is the precise phrase to use although the shorter 'price index' has now become acceptable). By this definition the price index number for the reference year is 100 and the index numbers for all other periods show immediately the extent of the price change between the reference year and the relevant period. The reference year has no statistical significance and it is usually chosen to accord with international conventions and with the rest of the United Kingdom national accounts system.

2.5 The year chosen to provide the data from which the basket of goods is derived is normally known as the base year and it need not be the same as the reference year. Unlike the reference year, the base year is statistically significant because the movement in the price index is partly determined by the relative importance of the items in the basket and that relative importance changes from year to year. In principle the method of index calculation takes the quantities bought or sold in the base year, values them at the price levels obtaining in both the current period and in the reference year, and divides the former by the latter: in practice price relatives are used in the calculation rather than the actual prices and the price relatives are combined by means of weights derived from value figures i.e.

quantity times price, rather than just quantities (a technical description is given in Appendix A).

2.6 The end result of this method is a base-weighted price index with all the advantages and disadvantages of such an index. The main advantage of an index with fixed weights is that any change in the index numbers arises solely from price movements; alterations in the relative importance of the quantities have no effect. The main disadvantage of a fixed weight index is that those alterations in relative importance, which are eliminated from the index, are actually occurring to a greater or lesser extent within the manufacturing sector, with the result that the fixed set of quantities may cease to represent the real world. In order to maintain the advantages of the fixed basket of goods and still produce an index relating to the real world, the base year of the WPI is changed at regular intervals.

2.7 Apart from the relative changes mentioned above more fundamental alterations occur in the structure of industry and these changes are considered every ten years or so when the Standard Industrial Classification itself is reviewed. If, as a result of this review, the statistical definition of the manufacturing sector is changed, then the structure of the WPIs is revised accordingly. The review which resulted in the 1980 revision of the SIC was directed towards bringing it more closely into conformity with the system used by the European Community. There will therefore be some restructuring of the WPI when it is rebased on to the new reference year of 1980.

Indices for current cost accounting

2.8 The use of the indices as economic indicators and for deflating series expressed in value terms were for a long time the main justification of the WPI system. However, the faster rate of inflation experienced during the 1970s emphasised the need for companies and other traders to take account of changing price levels when compiling their accounts. The Report of the Inflation Accounting Committee (the Sandilands Committee)[4] recommended a system of 'current cost accounting' in which fixed assets and stocks are normally stated in the balance sheet at current replacement cost, and in which the charges in the profit and loss account for depreciation and stock consumed are also normally based on current replacement cost. This system has now been codified in an accounting standard[5].

2.9 To provide accountants with a simple and objective means of revaluing assets from historical cost to current replacement cost, the Sandilands Committee recommended that the Government Statistical Service should publish a range of suitable price indices. That is now done regularly in *Price index numbers for Current Cost Accounting* (PINCCA), the first issue of which appeared in April 1976. This publication includes a wide range of the normal WPIs for specific product groups, plus indices built up from the same basic data to measure the average price changes in plant and machinery bought as fixed assets by specific industries, and the average price changes in stocks held by specific industries. As with the WPIs, these plant and machinery and stocks indices are built up in accordance with the SIC. For the plant and machinery indices the appropriate price quotations are combined in accordance with the value of purchases of those items by each sector of industry in the chosen base year: the stocks indices are calculated on the same general principle, but the values of purchases or sales are used as proxy weights according to the nature of the stocks. (A detailed description of the methods used to deflate stocks is available from the Department of Industry on request.)

2.10 Because the WPIs are compiled according to the SIC each of the price indices represents average price movements of groups of products throughout the whole country. An index may not be a good indicator of price movements in a particular region at certain times and it cannot hope to reflect the experience of each firm in that sector. Thus, although many private users do find the published price indices suitable, there are a number who prefer to have special indices compiled so as to reflect their own circumstances more closely. The main reason for these requests is the need for variation of price clauses in contracts. The user might want the same set of products as in the WPI but with a different weighting pattern; or he might ask for an index which includes products from a number of different sectors within the SIC. If resources have been available a special index has been supplied and a charge made to cover expenses. This service becomes more restricted in times of staff economies.

CHAPTER 3

WEIGHTING OF INDEX NUMBERS

Base year

3.1 As mentioned in paragraph 2.4 above, the WPI is based upon the concept of a fixed basket of goods. This concept is realised by combining the price relatives with a set of fixed weights i.e. by a Laspèyres index (Appendix A gives a full technical description of this index). Whatever may be the theoretical arguments for and against Laspèyres index numbers, the use of fixed weights in the WPI is dictated by the fact that the full range of information needed to revise the weighting pattern is available only at infrequent intervals. Sales data are available each year but the purchases inquiry, which provides data for both input and output indices (see Appendix B), is normally conducted roughly once every five years. The base year for the WPI is therefore decided by the year in which a purchases inquiry is held. The recommendation of international statistical organisations is that new base years occur at five-yearly intervals in years divisible by five. In practice however, although the reference year is chosen to fit in with this recommendation and with the United Kingdom national accounts system, the base year for the WPI will only do so if the purchases inquiry is held in the appropriate year. When base year and reference year differ, the weights are composed of the quantities sold or purchased in the base year and revalued to the prices ruling in the reference year. Every effort is made to see that the weights all relate to the one period, although that cannot always be achieved.

Basic source of data

3.2 A full description of the principles involved and the methods used in deriving weighting patterns for the WPI is given in Appendix B. The starting point in deriving most of the weights for the indices is the aggregated annual figures for the base year collected by the Business Statistics Office in their quarterly inquiries into manufacturers' sales. In the data supplied to the WPI section, these figures are shown separately for each establishment together with a total, for each product group, for all establishments under common ownership (the enterprise). It is this latter figure — the total sales of the particular product group by the enterprise — which provides the weight used to combine the price relatives calculated from that contributor's price quotations with those from others to form the first-stage, i.e. product group, index. Thus the weights used in the basic indices are the gross sales in the base year.

Net sector and gross sector weights

3.3 Once calculation of indices reaches a higher level of aggregation there are two weighting patterns, one for net sector and one for gross sector indices; the differences between these two are explained fully in Appendix B. All input indices are compiled as net sector indices in principle although deficiencies in the data bring about some slight departures from the general rule. The picture is rather mixed with the output indices: below MLH level only gross sector indices are compiled; at MLH level both gross and net sector indices are compiled; at SIC Order and 'all manufacturing' level only net sector indices are compiled. All published WPIs are described as net sector indices although, at the levels below MLH, the gross sector indices are used as proxies because the difference between the two is likely to be very small. At present there are very few countries in the world which publish net sector indices even though it is the method advocated by the Statistical Office of the United Nations. Notwithstanding this recommendation, the Statistical Office of the European Community proposes to publish gross sector indices for member countries from 1983 onwards.

3.4 As has already been stated, there is little difference between net and gross indices at the lowest levels, but there may well be divergencies in movements at MLH and higher levels of aggregation. When using the gross sector method, an index for any sector can be regarded as a weighted average of the sub-sector indices and its value will always lie within the range of the sub-sector index values. That need not be so with the net sector method because a different set of weights will apply at the sector and sub-sector levels. To take an extreme example an item which was important at sub-sector level could disappear altogether at sector level because all transactions in that item took place within the sector. In general however, the extent of the 'netting out' is fairly small in producing the output indices so the differences between the net and gross indices will not be very large. In contrast the net sector input indices require a considerable amount of 'netting out' at the higher levels of aggregation. The MLH indices will include a significant proportion of purchases of semi-manufactures but, when calculating the input index for all manufacturing, they will be classed as within-sector transactions and will disappear, leaving mainly imports of raw materials — with a weight of about 55 per cent — and purchases from sectors outside manufacturing. If any of these indices, either input or output, are used for contract

price adjustment or for internal management purposes the user will need to think carefully about and perhaps obtain advice upon the one most suitable for his needs.

Indices for capital goods and for current cost accounting

3.5 There is one important exception to this netting out procedure. An attempt is made to ensure that all capital transactions in respect of plant, machinery and vehicles are included in the output price indices. A sale of a generator to a manufacturer of electrical machinery or a car-transporter to a vehicle assembler would be included in the net sector output indices for the appropriate MLHs and any higher level indices including 'all manufacturing'. This exception keeps the WPIs in conformity with the general economic framework of input/output analysis where a purchaser of a capital asset is regarded as a final buyer. Any WPI which relates to plant and machinery will therefore be a gross sector index, as will the corresponding indices published in PINCCA (see paragraph 1.4 (*iv*)). All the stocks indices in PINCCA are also gross sector indices as they are designed to revalue the items held in stock by manufacturers — either materials and fuel or finished goods — and the source of supply is not relevant.

Linking of two index series

3.6 A new set of weights is derived every five years and a description of a rebasing and reweighting exercise is given in Appendix B. Once the new weights have been produced, a new series of WPIs are calculated on the new base for each month going back for a number of years. This new series might show different movements from the one it is superseding if there have been some large revisions in weights — events such as the dramatic rises in oil prices in 1973 and 1979 can cause a shift in the weighting patterns. In the main large revisions to weights are rare and so the differences between the old and new index series are small. In principle the validity of a price index diminishes as the period covered moves further away from the base year and the 'best' point at which to move from the old to the new series is mid-way between the two base periods, provided there have been no unusual events of the kind described above. In practice however the old series will have been published and used, for contract price adjustment and other purposes, well past that mid-point before the new series appears. Users will be loath to go back over old contracts to renegotiate prices simply because the latest series suggests slightly different price movements. For the convenience of users, therefore, when the new series is first published, the last firm index on the old series is linked to the index value for the same month on the new series. The ratio between these two indices provides a multiplication factor by means of which index values in the new series can be converted to the old base so that continuity can be obtained for contracts which span the two series. Those who use the indices for contract price adjustment need to bear in mind that they are rebased periodically and allow for the eventuality in their contracts.

Chain linking in the wholesale price index

3.7 Although the WPIs are Laspèyres indices with the weights remaining fixed between rebasings when compiling indices at the higher levels, a few modifications of this rule occur for the compilation of first-stage indices. Radical changes in market shares of the producing companies can occur occasionally in some sectors, making the base year weighting pattern unrepresentative; in such cases the sales pattern for the most recent available year would be used to combine price quotations from the different contributors to produce a first-stage index. Another area in which the weights are changed is in respect of a few commodities which can be either imported or purchased from a United Kingdom producer. If the price movements of the imported and the home-produced products diverge and the relative importance of the two sources changes for whatever reason — price, quality, after-sales service — then a price index using fixed weights becomes increasingly divorced from the actual experience of firms making purchases of materials and fuel in the manufacturing sector. The best known example of such a transfer is the replacement of imported crude oil with that from the North Sea. Fortunately, in these cases, the relevant figures for each product group are available each year from the quarterly sales inquiries and the import and export tables in the overseas trade statistics. From this data the relative importance of imports and home-produced items can be derived and the weights adjusted accordingly for the next twelve months. This adjustment takes place only when compiling the first-stage index and in no way affects the weight used to combine that index with others to form a higher level index. Indeed at the higher levels the netting out generally removes most of the home-produced items and leaves only imports.

Treatment of missing components

3.8 The aim of the Department is to obtain a set of indices as accurate as resources will allow. Limited resources inevitably mean that there are gaps in the structure of the indices. If, when compiling an index for a sector with a number of product group components, it is discovered that one or more of the components are not covered by price quotations and therefore have no index, a decision has to be made on the method of dealing with the gaps. The simplest method is to ignore that particular component when compiling the sector index, i.e. give it a weight of zero; but include its sales value in the weight used subsequently when combining that sector's index with others to form a higher level index. This method is equivalent to assuming that the price movement of the missing component is best measured by the weighted

average of the remaining product groups in the same sector. That might well be a reasonable assumption in a sector composed of product groups with similar price movements over a long period but that does not always apply in the areas where the gaps exist. If resources were available it might be possible to review the missing product groups and identify suitable proxy price indicators from other sectors. For instance, if a missing item were largely composed of one material for which price quotations were supplied, they could be used not only within their own sector but also as proxies for the missing item. Such an approach would be limited in its effect and would require extra resources. The simple method outlined above is therefore the one adopted in setting up the weighting system.

3.9 The presence of a price quotation for a product group does not entirely remove the problem outlined above. There are certain product groups for which a large sales value might be represented by one quotation from a contributor who only accounts for a very small proportion of the total sales value. The price index for the sector containing that product group is then based in part upon that one quotation, which carries a weight in proportion to the total sales value of the whole product group and not just to the sales figure of the contributor. This situation presents no problems until that one quotation shows a price movement which is atypical compared with the rest of the sector. The question then arises as to whether this one quotation should be allowed to have such a large influence upon the sector index, out of proportion to the actual coverage known to be appropriate to the contributor. The only fully satisfactory answer to this problem is to reduce its impact by recruiting more firms to provide price quotations, but that is not always possible when conducting a voluntary survey. From time to time therefore these atypical movements are dampened down by using a more widely based index as a proxy in a particular month.

CHAPTER 4

DATA COLLECTION PROCEDURES

Introduction

4.1 The price quotations which form the basic data for all the price indices are supplied voluntarily, mainly by manufacturers but with some coming from trade associations and from importers; a small number of quotations appearing in trade publications are also used. In all about 11,000 quotations are used each month and 90 per cent of them are collected and processed by the Department of Industry. The remainder are collected by the Ministry of Agriculture, Fisheries and Food (food and drink industries) and by the Department of Energy (the energy industries) and passed to the Department of Industry for incorporation into aggregate indices. Some of these 11,000 price quotations form an element of the input indices only (e.g. crude oil); some are used as part of the output indices only (e.g. cars); yet a third group are constituents of both sets of indices (e.g. steel).

Recruitment of firms

4.2 The requirements of a statistically designed sample for the WPI — as described in Appendix C — are formidable, and no attempt is made to obtain contributors or price quotations by random selection processes. Instead a judgemental or purposive approach is adopted in recruiting respondents. An examination of the data supplied to the section from the quarterly sales inquiries reveals the more important product groups and also gives details of the manufacturers involved. Letters are written mainly to the large manufacturers of the product group and any relevant trade associations are also approached. If a firm is willing to help, agreement is reached, by correspondence or discussion, on the provision of one or more price quotations for items within each product group concerned. The selection of items is made by the contributor with guidance from the Department. The aim is to achieve a selection of items which 'represent' all other items in the product group with respect to price movements. Discussions with manufacturers often show that price movements within a product group are similar so a comparatively small number of price quotations will 'represent' all the items and, if the quotations are for items contributing the greatest value, this 'representativeness' is further strengthened (this concept of representativeness is discussed more fully in Appendix A). On average each contributor provides four price quotations but they can relate to different product groups.

Full specification details

4.3 Once an item has been agreed with a producer a full description is drawn up and entered on the price quotation shuttle card. This card (see Appendix D) is so called because it shuttles backwards and forwards by post between the contributor and the Department. The description on the price quotation shuttle card must be fully comprehensive, including any characteristic of the item whose change could affect the price. The initial discussions with the contributor on the price quotation cover the following points:

a The physical attributes — capacity, material composition, packaging.

b Units of sale — numbers, weight, size of order.

c Point at which sold — 'ex works' or 'delivered'.

d Timing of price quoted — 'time of order' or 'time of delivery'.

e Treatment of discounts and premiums.

f Treatment of indirect taxes.

g Date of price change.

It is quite obvious that the first two points must be covered in the specification since any change here would constitute a change in the fixed basket of goods and might well lead to a distortion in the index at some later period if not recognised and allowed for in the compilation. The other points are equally important however, for a variety of reasons, and are discussed in turn in the following paragraphs.

Delivered or ex-works

4.4 The specification must state whether the quoted price refers to the price of the item at the factory gate i.e.

ex-works, or whether it is a delivered price, including transport to the purchasers' premises. In principal an output price index should be based upon an ex-works price and an input price index should use delivered prices. In the interests of obtaining co-operation the general practice is to agree with the contributor a price which accords with the way in which business is normally conducted, emphasising the importance of informing the Department of any change in the future. In the main, delivery charges form a very small proportion of the total charge and the price movements of ex-works and delivered quotations are likely to be very similar. In those few instances where delivery charges are an important element of the total cost — sand, cement, granite chippings — two indices are calculated, one including and the other excluding the delivery charge.

Time of order or time of delivery

4.5 In any one month a contributor may be delivering to his customers items for which he is charging one price whilst at the same time taking orders from customers for the same items for which he may be quoting a different price. When the lag between order and delivery is short the difference in the two prices is trivial or even non-existent: as the lag increases so does the possibility of a difference between the two prices. It is important, particularly in a period of steeply rising prices, to decide between the two and a 'time of order' price is always asked for, although a 'time of delivery' price is accepted if that is all the contributor can provide. Where there is a lag between order and delivery, a 'time of order' price index should serve as a leading indicator of actual changes in prices of delivered goods. It is however less suitable than the alternative for deflating value figures of sales, purchases and stocks. In industries where the lag between order and delivery is large, the WPI is itself appropriately lagged when used for deflation purposes within the government statistical service, as described in an article in *Economic Trends*[6]. Published figures are unlagged.

Transaction prices

4.6 Even when the item has been fully specified it remains to obtain the price at which new business is transacted for that item. The list price quoted by the manufacturer is not always satisfactory because discounts may be offered to customers. These discounts vary with the size of the order and may be special to particular customers; they may even turn into premiums. In practice it is usually found possible to agree with the contributor on a discount offered to most customers or on one averaged over all customers. There are a few occasions when the discounting arrangements are very complex and the only feasible method is for the contributor to provide an average price. Provided the average relates to a fully homogeneous set of items this method is satisfactory but that cannot always be guaranteed. It is also a method which entails a lot of work on the part of the contributor so it is avoided if at all possible.

Treatment of tax

4.7 All the index numbers are compiled exclusive of value added tax and (before its abolition) of purchase tax. The WPI is designed to reveal changes in manufacturers' costs, i.e. those arising from the purchases of materials and fuel (input indices), and manufacturers' prices (output indices). As VAT is recoverable by all but the very smallest traders it has no direct impact upon costs or prices and is therefore excluded. Thus the WPI, unlike the RPI, is not affected by any changes in VAT rates. Revenue duties (on cigarettes and manufactured tobacco, alcoholic liquor, matches and mechanical lighters) are paid by the manufacturer as part of his input costs so they are included in the appropriate indices. The duty on hydrocarbon oils is charged at the point of delivery from the refinery so it is excluded from the output price index for MLH 262. However all other sectors within manufacturing pay the duty on their purchases of hydrocarbon oil so their individual input cost indices include it.

Date of price change

4.8 The specimen copy of the price quotation shuttle card at Appendix D shows a column for the date at which the price change becomes effective in the month. The provision by the contributor of the actual date of the price change makes it possible to calculate indices which relate to average prices for the whole month rather than to one specific day in the month. No extra burden is placed upon the contributor by asking for this date; if the inquiry were tied to a specific date in the month he would still have to know the date of the price change, in order to be able to complete the card correctly. It is unlikely that there would be much difference between indices based upon the two different methods but an index which measures average monthly prices produces annual indices which are genuine averages covering every day in the year and not simply the average of twelve days i.e. one day in each month of the year.

Export prices

4.9 It has already been mentioned that a producer may

not have one price only for a particular commodity but may vary his discounts according to the customer and size of order. One very important reason for different prices for the same item arises when it is offered for sale on the home market or as an export. All output WPIs relate to products made by manufacturers in the United Kingdom and sold in the home market. If a product is not being sold directly for export then it is considered to be a home sale and it is formally within the scope of the WPI, even though it might ultimately be exported. As an example bearings produced by a United Kingdom manufacturer and sold to a United Kingdom vehicle manufacturer for incorporation into a vehicle which was finally exported would be counted as a home sale and the price data for that transaction would be included, in principle if not in practice, in the WPI. Thus contributors are asked to quote the price which they are charging for the item in the United Kingdom market and to ignore their export prices.

Import prices

4.10 Although export prices have no part to play in the WPI a significant proportion of the inputs to the United Kingdom manufacturing sector are imported. At the MLH level the importance of these imported items varies from one part of the manufacturing sector to another. As indices are calculated at the higher level of industrial aggregation the home-produced inputs are netted out by the procedures described in Appendix B, and the imports grow in relative importance. The advent of North Sea oil has helped to reduce imports of raw materials but that has been counter-balanced by increased purchases over the years of imported semi-manufactures, a situation not yet fully reflected in the WPI price data. Nevertheless resources are devoted to collecting import price information and, altogether, about 400 quotations are obtained each month from various sources. As mentioned in paragraph 4.4, these quotations should be priced at the point when the manufacturer takes delivery i.e. including all carriage, insurance and freight as well as transport charges within the United Kingdom. Although every effort is made to obtain prices on that basis, only a small proportion of quotations cover all costs and most refer to an earlier point in the purchasing procedure.

4.11 The import indices differ from other parts of the WPI in that quite a large proportion are based upon price quotations which appear in various trade publications or in newspapers. A glance at Table 4 in Appendix E will show that over half of the import indices are derived from such sources. These quotations are examined closely to ensure that the price refers to a group of homogeneous items whose individual price movements are likely to be similar so that the index is not affected by any changes in product mix. Only those which are thought to be reliable indicators are used and they are watched carefully to ensure that they remain so.

CHAPTER 5

PRACTICAL PROBLEMS CONSIDERED

Maintenance of quality

5.1 A very large proportion of the United Kingdom manufacturing sector is now covered in the WPI by price indicators, although some particularly complex sectors still remain to be developed. The work does not cease, however, with the recruitment of an adequate number of price quotations for a sector. Development involves not only the improvement of the deficient indices but also the maintenance in quality of those already set up. About 1,000 price quotations are lost each year for various reasons — the item might go out of production or the firm cease trading altogether. In about half of these cases the contributor can provide an alternative price quotation for the lost item but the remainder constitute the annual wastage which must be made good in order to preserve the quality of the index. In addition to these losses some 500 to 600 items are subject to modification during the year and, although the prices continue to be reported, they relate to a changed specification. These specification changes vary in complexity but they all require extra effort to ensure the continuation of a reliable index. Throughout each year therefore, resources need to be devoted to about 15 per cent of the existing quotations simply in order to prevent any deterioration in quality.

Linking of items

5.2 The WPI is designed to measure the price movement over time of a fixed basket of goods. A rigid adherence to this principle of a fixed basket would require that prices be collected only for those items available throughout the whole life-time of the index series. The manufacturing sector sees a constant disappearance of old items and appearance of new ones however, and such a rigid rule would produce a gradual deterioration in the quality of the index as it came to depend upon fewer and fewer price quotations. In order to maintain and, indeed, improve the quality of the index therefore, new price quotations are incorporated into the calculations as they become available. Whenever a new price quotation is linked into the system it must be given its appropriate weight and price relative. The weight for the new component is arrived at in accordance with the principles set out in Chapter 3, and the weights of the existing components are adjusted to allow for the new item by a simple arithmetical procedure. The treatment of the price relative is not quite so simple.

5.3 There is no question of producing a price relative for every month back to the base period. Even if the required price information were available, and that is rarely the case, its incorporation into the index might well entail revisions to past periods. These revisions would occur every time a new price quotation was provided, bringing about a constant series of trivial changes to past figures as well as a vast amount of work. To avoid these problems each new price quotation introduced in a month is assigned the price relative of the parent first-stage index of which it forms part. The new item assumes this price relative not only for the month in which it appears in the calculation for the first time but for all earlier months back to the base period. This method reduces the number of revisions to earlier indices and, in addition, it automatically provides a base period price which can be used to calculate price relatives for all subsequent months.

5.4 Some items, although new in one sense, can be regarded as replacements for existing items which are disappearing from the index e.g. a new model of record player, or transistor radio. In these cases the new item will be assigned the past history, i.e. the price relatives in earlier periods, of the one item it is replacing rather than that for the complete first-stage index. The main difficulty with these replacement items lies in assigning a price relative to the link month. If both old and new items have been on offer to customers for a period together, with full market conditions applying to both (e.g. there has been no deliberate policy on the part of the manufacturer to depress the price of the old item in order to sell outstanding stocks), the new item can simply take over the price relative of the old in the link month. The assumption in operation here is that any difference in price reflects a difference in quality between the two items. If however the difference between the two quotations is thought to include a price element in addition to any quality factor this price element must be reflected in the price relative adopted in the link month, even though all previous periods will retain the price relative of the old item. This distinction between quality and price and its implications for the linking mechanism is discussed further below.

New models

5.5 The linking of price quotations is more difficult when there is no period of overlap between the new item and the old. This situation is encountered most often with consumer durables — refrigerators, saloon cars, televisions

— where it is considered important to produce a new model from time to time. It also occurs with fashion clothing which changes with the seasons so that the price quotation for the autumn/winter costume is only supplied for a few months and is then replaced by something from the spring/summer fashions. In this latter sector the problem is exacerbated because the replacement item is probably in a different product group and therefore a different first-stage index. Where there is no overlapping period in which both models are on offer to customers no objective measure of their relative worth is available. The new car or television set may well give a better service, but manufacturers will often use the introduction of a new model as an opportunity to raise prices over and above the level of the increased service. Sometimes the new model will be inferior in quality because, perhaps, less durable material has been used in its construction. In all such cases it is unwise to link the new price quotation directly to the old without adjustment and the contributor is asked to provide an estimate of the quality difference between the two models so that it can be factored out of the index.

Specification changes

5.6 Another important cause of changes in the basket of goods, and of discontinuities in the index, occurs when a basic model or product undergoes a specification change of some kind. Specification changes vary greatly both in type and complexity. The simplest changes are those which reflect a difference in quantity — a change in the size of container, perhaps because of a move from imperial to metric measurement, or a change in the number of items in the standard pack. These are incorporated into the index by a simple arithmetical adjustment to the new unit of measurement. A rather less straightforward change might involve the substitution of one material for another in the fabrication of an item e.g. plastic instead of wood or man-made fibres in place of natural. In many cases of this kind it is difficult to assert firmly that the level of service has been altered in any way and the two items are considered, for the purposes of the index, to be identical. These material substitution items can produce an added complication when, in much the same manner as with the seasonal fashions mentioned in paragraph 5.5, the new item belongs to a different product group from the old or even, occasionally, a different MLH.

5.7 The most difficult problems arise when alterations are made to an item for which a price quotation is being provided and those alterations are considered to improve the service being offered thus making the item more useful to the purchaser. A machine which requires less maintenance; an electric lamp with a longer life; a television set with an extra channel available; a saloon car with a better cooling system; all of these situations represent an alteration to the original basket of goods, requiring very careful consideration before incorporating the price quotation for the changed item into the index calculation. The advice of the contributor is always sought in these circumstances. If he considers that the difference in price is entirely attributable to the improved service then that difference is completely factored out of the calculation. A change in specification may however be used by a manufacturer as an opportunity to increase prices so that the difference between the old and new items will be due partly to the specification or quality change and partly to an actual price increase; the contributors are asked to provide an assessment of the two separate elements in these cases. A more difficult situation is one in which a specification change has improved the quality of the item without increasing the cost of production or the selling price. In principle the contributor would be asked to give an assessment of the improvement and the item would be considered to have been reduced in price accordingly. In our experience such situations are rare.

Measurement of quality changes

5.8 Contributors are co-operative in trying to separate quality and price elements in these cases but the difficulties of making such assessments are obvious. The concept of quality is nebulous comprising both objective and subjective elements. It has been suggested that what matters is the degree of satisfaction experienced by the purchaser but this approach is not favoured by compilers of price indices because of the obvious difficulties, indeed impossibility, of measuring satisfaction. It might for instance be possible to change the specification of an engine in order to reduce petrol consumption by 25 per cent but an assessment of the change in consumer satisfaction would be impossible because petrol consumption is but one facet of the whole car and will have a different importance for each purchaser. Thus when a contributor is faced with the problem of assessing the quality component in a specification change he is likely to use the increase in his own production costs as a measure of the improvement in quality. This approach has the merit of objectivity. If it is the only method used however it means that there are some real though unquanitifiable improvements in the output of particular sectors of manufacturing industry — especially in the engineering sector — which are not reflected in official index numbers. Here, as in other areas, our statistical measuring devices cannot match the subtlety of the real world.

Advanced technology sectors

5.9 The problems discussed in the preceding paragraphs are particularly acute in industries which are subject to rapid technological change. The substitution of the transistor for the valve changed both production methods and the quality of service to an extent that cannot be objectively assessed. The linking of the old and new items in that instance can be no more than a subjective judgement. Similarly the technological gap between two generations of computers is so wide that there is no 'right' way of linking them. Even during the period when the one type of computer is being sold, the variations in customer demand mean that no two orders are exactly equivalent. This problem also occurs but with added problems in the aircraft and shipbuilding industries; not only are there variations in specification here but the very long gestation

period means that orders are taken at very infrequent intervals; a monthly price quotation therefore has little significance. Yet a further complication can arise in shipbuilding and other areas where large capital projects are involved, where an agreed price might be influenced by the financing arrangements which form part of the contract so that, even if it were possible to devise a price index, its interpretation would require great ingenuity. These problems have proved so intractable that, at the time of publication of this booklet, there are some very important sectors of the Engineering and allied industries (Orders VII to XII of the 1968 SIC) for which no WPIs are available, as can be seen from Table A of Appendix B.

Contributors' index numbers

5.10 Some contributors find it difficult to provide a series of price quotations to the Department. They may feel that they cannot distinguish a few representative items but need to take most of their products into account to measure price changes; they may have very variable discount arrangements which could not easily be incorporated into the WPI system; they may already have insituted a system of their own which they would prefer to use. Whatever the reason there are some contributors who provide a composite price index of their own. The advantage of a contributor's index number is that it will probably include quite a large number of items, more than could be obtained by way of quotations: the main disadvantage is that we cannot be sure that specification changes are dealt with adequately. In addition the base year will not necessarily be the same as that being used for the WPI and that might produce a different price movement from the 'correct' one, although the discrepancy is likely to be small unless the price changes of the individual items vary widely. Individual price quotations are preferable and every effort is made to secure them. If that cannot be achieved, discussions are held with the potential contributor to ensure that the method of calculation is appropriate to the WPI needs. About one per cent of quotations are of this kind but their incidence varies widely throughout manufacturing with a concentration in the engineering sector.

CHAPTER 6

PROCESSING AND PUBLICATION

Data checks

6.1 A wide range of price index numbers is produced and published every month and a regular procedure is followed to ensure, as far as resources permit, that timely and accurate figures are available. The price quotation shuttle cards are sent out to contributors at the beginning of the month for which price quotations are being sought. Fortunately many contributors know of their price changes some way ahead and about 65 per cent of the quotations are returned by the end of the month. Upon receipt of each price quotation shuttle card, the first task is to check the latest month's information.

6.2 Each price quotation shuttle card is examined on its return for any mistakes or omissions and to see that no specification change has occurred. If there is a specification change, the procedures outlined in Chapter 5 are followed; if there are no such changes, then the price quoted in the latest month is examined and compared with the previous month. If the price has decreased, or has increased by more than 10 per cent, the figure is queried with the contributor to ensure that it is correct. These queries usually confirm the price but mistakes are found and corrected and occasionally a specification change comes to light. A longer-term checking procedure identifies the 'too stable' items, which are those quotations which have remained the same for six months or more. These items are also queried with contributors and the occasional missed price increase discovered. Sometimes it transpires that the item no longer has a typical price movement and it is replaced.

Imputation for late items

6.3 A decision on the timing of the first calculation of the WPI for each month must balance both accuracy and timeliness; in consequence the first provisional figures are made available before all the data have been returned by contributors. An imputation procedure is therefore used to cover the missing items. in the early years of the WPI the method assumed no change and, where price data were missing, used the last known price for all subsequent months. This method was used for quite a long period when price increases were generally of the order of 3-5 per cent per annum and, whilst it obviously had a built-in downward bias, the size of that bias was not sufficient to cause much concern. With the advent of the higher rates of inflation of the 1970s however it was found that the first estimate for a month was constantly being revised upwards by a significant amount and it was decided that an alternative imputation procedure was necessary.

6.4 Procedures were therefore written into the computer programs to apply to a missing item the price movement of a suitable proxy available in the relevant month. Imputation is applied at the lowest level i.e. on the price relatives of individual items, which are combined to form a first-stage index. There are two proxies used depending upon the degree of response within the first-stage index to which the missing item or items belong. If response in that index is 50 per cent or more, the average movement of the responding contributors is imputed to the outstanding items; at this lowest level items generally form a homogeneous product group with similar price influences acting upon them, so the responders from within the product group should provide the best proxy indicator of price movements of the non-responders. This use of the parent product group has been found to work reasonably well in the main, although one or two important sectors have shown a response pattern in which the quotations with no price change are returned more promptly than those recording a change. For these sectors special arrangements have been made to contact the outstanding contributors to obtain the latest figures over the telephone. A different proxy is used if response is below 50 per cent. When that occurs the case for using the parent product group is not so strong and the missing items are given the average movement of the SIC Order of which they form part. These imputation procedures have helped to remove the downward bias in the first estimates of the output indices. Unfortunately it cannot be applied to the input indices, primarily because the higher stage input indices include a large proportion of quotations for imports, which are organised according to the overseas trade statistics and do not conform to an integrated industrial structure in the same way as the output items. In addition the vagaries of the exchange rate, with imports of similar items coming from a variety of countries whose currencies may be moving in different ways, make it extremely difficult to use other price movements as proxy indicators for missing items. In the main therefore, the imputation procedure for missing imported items is to use the last-known price data, adjusted where considered appropriate in accordance with movements in the sterling exchange rate in the relevant month.

6.5 This use of the parent product group or SIC Order as a proxy is a general rule applied to all missing output price quotations; its suitability obviously varies from one item to another. When discussing the treatment of missing components in the weighting pattern (paragraph 3.8) it was mentioned that suitable proxy indicators can occasionally be found from quite different industrial sectors because of a common link such as the same

material used in manufacture. The same procedure might help to improve the early estimates but it has not yet proved possible to introduce the degree of programming flexibility required to select the appropriate proxy each month.

Publication of the wholesale price index

6.6 The price index numbers are made available to users each month firstly by the issue of a Press Notice and later by an article in the journal *British business*. In deciding just when the indices should be published the varying needs of the users of the WPI have to be considered and a balance has to be struck between accuracy and timeliness. For economic analysts, who are primarily interested in measuring the rate of price inflation at the 'all manufacturing' level, the emphasis is on speed of dissemination; company accountants, using the indices for current cost accounting adjustments to their annual accounts, prefer to wait for an index that is unlikely to be further revised; parties to contracts with price adjustment clauses like to have early estimates to help with progress payments but also like to see an index go firm as quickly as possible. With this variety of needs prompt publication is thought to be the best policy to pursue and the monthly press notice is issued within five to twelve days of the end of the month covered by the figures. The *British business* article appears about ten days later with a full range of tables (as shown in Appendix E) and a commentary on the more important price trends. The press notice discusses price movements at the highest levels of aggregation and includes the figures shown in Tables 1 and 2 in Appendix E.

Provisional and firm indices

6.7 The index numbers relating to the highest levels of aggregation (Tables 1 and 2) which are published for the most recent month are usually based on about 65 per cent response (in terms of value of sales of all contributors); those for the immediately preceding month are based upon a response of 90 per cent or so. Of course at the MLH and lower levels (Table 3) the response varies greatly and can occasionally be very low indeed in the first month. It is in these cases that the second of the imputation procedures, described in paragraph 6.4, is used and the resultant figure for the product group is particularly unreliable. All indices for the two most recent months are labelled provisional but, where the figure has been largely derived from the imputation procedure, it is specially described as an estimate subject to possible major revision.

6.8 In the main the provisional label is removed from the indices when they are published for the third time. A determined effort is therefore made to obtain all the outstanding quotations in respect of this third month by contacting the contributors concerned, initially by telephone and subsequently by letter. If the provisional label is retained longer than two months for an index in Table 1 or 2 it is because response is below 95 per cent. It has been found that, once this level of response has been attained, any additional data is unlikely to produce a significant change in a high level index. That situation does not, however, always apply to the lower level indices in Tables 3 and 4 and a response rate of 98 per cent is required here in order to remove the provisional label. The lower level indices are often used in contract price adjustment clauses so every effort is made to make them as accurate as possible before declaring them firm. As can be seen from Appendix E the indices in Table 3 relate to the most recent four months only. In spite of the determined efforts mentioned above the occasional index remains provisional for periods of five months or longer. Once all the data has finally been received and the firm index calculated, it is published for each of the months affected as an addendum to Table 3 so that users are able to use that firm index as soon as it is known (an example of such a case can be seen in Appendix E).

Revisions policy

6.9 Before the provisional label is removed from a published index every effort is made to ensure that the basic data being supplied is correct and unlikely to be further revised. Occasionally however — perhaps as a result of the 'too stable' check described in paragraph 6.2 — an index published as firm is later found to be wrong, usually because a contributor has recorded the wrong price change or no price change at all for an earlier period. The revision can easily be published in respect of those months still covered in the next edition of *British business* but that still leaves a decision to be made for earlier periods. A decision rule has been devised to cover these situations. The published indices which are affected by the new data are recalculated and a comparison made between the published and corrected figures. If the difference between these two figures is below one per cent for the product index, no action is taken unless the correction changes the direction of the movement — the size of the revision is thought to be too small to outweigh the difficulties arising for index users from changes to firm figures. If the difference exceeds one per cent the corrected index is published; and if that corrected index is an important element of a higher level index, then the revised higher level index may also be published, even though the difference at that level is less than one per cent. The corrected figures are published as far back as necessary in an addendum to the normal Table 3 in the *British business* article (an example can be seen in Appendix E). Corrections of this kind are published for less than one per cent of the indices in the course of a year.

Accuracy of the indices

6.10 The fact that an index for a particular product group has been declared to be firm means that all or virtually all

the price quotations have been received from contributors and incorporated into the calculation. The index published as firm is accurate in the sense that it is not expected to change its value: it does not necessarily provide a completely accurate assessment of the average price movement for that product group. A number of indices can all be equally accurate in the first sense but we may have varying degrees of confidence in their accuracy in the second sense. However, for the reasons explained in Appendix C, the nature of the WPI sample does not permit the calculation of any objective measure of accuracy. These varying degrees of confidence which we may have in different indices are an amalgam of three main characteristics of each individual index — the sales coverage of the sample, the variability of the component price relatives, and the importance and complexity of specification changes.

6.11 Considering these three characteristics in reverse order, there are a number of indices calculated for 'advanced technology' products which are affected by the problem of specification changes. Despite doubts over their accuracy they nevertheless provide the best available measure of price movements in the product groups concerned. When compiling higher level indices it is better to include a component index which, however doubtful, is specifically related to the 'advanced technology' product than to exclude it and so allow the average price movements of all other products to act as a proxy indicator. The indices for these products are probably the least accurate within the WPI system but the complexity of specification changes and its effect upon an index is not susceptible to measurement in any way.

6.12 The second element — the variability of the component price relatives within an index — is calculated each month for the first-stage indices and the figures obtained could perhaps provide a partial measure of the degree of confidence to be attached to that index. However the sample is a non-random one perhaps with bias present to an unknown extent so this measurement of the variability of the component price relatives would not have a clear meaning. In addition it can change in size from month to month depending upon the pricing procedures and timing of the price changes of contributors. Whilst this second element has the merit of objectivity its interpretation remains a matter of judgement.

6.13 The first of the three elements — sales coverage for the particular product of the sample contributors — probably has the most immediate appeal and is the easiest to provide. It is also a relatively stable measure from month to month, although in the longer-term it can change as contributors are lost or gained. There are, however, limitations in this measure. It is obvious that the level of confidence in an index will increase as the sales coverage increases but there is no direct relationship between the coverage and the degree of accuracy. In addition the presence of other factors, such as those mentioned above, means that two indices based upon samples with the same sales coverage need not be equally accurate. This measure has its greatest validity at the lowest levels of aggregation where an index relates to a homogeneous product group, but it becomes more difficult to interpret at the higher levels. Nevertheless, despite these limitations, it is the most useful indicator of confidence available and it is one of the criteria used to determine whether or not an index should be published.

6.14 A much larger number of indices are actually compiled than those appearing in the tables in the *British business* article. In particular many more could be added to Table 3 but are excluded, mainly because of disclosure problems and lack of confidence in their reliability. The disclosure problem is discussed more fully in the next paragraph. The confidence criterion is almost entirely in terms of sales coverage — if the contributors' sales exceed 30 per cent of the total sales of the product group, the index for that product group is included in Table 3. Therefore, as new contributors are recruited and the sales coverage for a sector increases above 30 per cent so a new index will appear in Table 3: conversely, as existing contributors drop out and the sales coverage reduces, indices are withdrawn from the table. This withdrawal does not necessarily mean that the index is no longer available to users. Provided the confidentiality requirements, as discussed in the next paragraph, are met, the index can be supplied each month to individual users, although they are warned of the low level of confidence attached to it.

Confidentiality

6.15 As with all other government statistical inquiries much time and effort is devoted to ensuring that the price information from contributors is treated in strict confidence. The identity of contributors is never divulged. No individual price quotations are released outside the WPI section and every effort is made to prevent the movement of a price quotation being deduced from information made available to users. If an index has less than four contributors, or if one or two contributors have a dominating influence on an index, it will be used only within government and will not be published or made available in any way unless the contributors concerned have given their consent. In addition to requests for unpublished and special index numbers, users of the WPI also ask for data on the composition of the indices i.e. the products included and their respective weights. At the higher levels of aggregation this information is derivable from published data, namely the annual total of the quarterly sales figures appearing in Business Monitors. Such requests can therefore be readily satisfied. At the lower levels however, where price quotations from several contributors are being combined to produce a product group index, the weights can sometimes reveal the relative importance of those contributors' sales in the base year, thus infringing a confidentiality guarantee given by the Business Statistics Office. The general rule in these circumstances is to be as helpful as possible but always with due regard to the interests of contributors.

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APPENDIX A

TECHNICAL DESCRIPTION OF THE WHOLESALE PRICE INDEX

General description of Laspèyres price index

A1. The wholesale price index is a Laspèyres price index and the simplest expression for such an index is

$$100 \times \frac{\sum Q_{(b)} P_{(c)}}{\sum Q_{(b)} P_{(b)}} \qquad (1)$$

where Q and P are the quantities and prices respectively of products, the subscript (b) denotes 'in the base period' and the subscript (c) denotes 'in the current period'.

A2. This expression needs to be modified slightly when the base year of the index (the year for which the value figures $\sum Q P$ are available) differs from this reference year. In these circumstances the expression is

$$100 \times \frac{\sum Q_{(b)} P_{(c)}}{\sum Q_{(b)} P_{(r)}} \qquad (2)$$

where the subscript (r) denotes 'in the reference period'.

A3. These two expressions suggest that, for each product, the base period quantity is multiplied by the current period price for the numerator and either the base period or reference period price for the denominator. The more usual method of calculating price indices, and the one used for the WPI, is to obtain price relatives for products $(P_{(c)}/P_{(b)})$ and combine them by means of value weights related to the base or reference period. For this more usual method the expression corresponding to (1) is

$$100 \times \frac{\sum (Q_{(b)} P_{(b)}) P_{(c)}/P_{(b)}}{\sum Q_{(b)} P_{(b)}} \qquad (3)$$

A4. If the base period and reference period are not the same then the required weights are obtained by applying the price relative between the reference period and base period to the base period value for each product as follows

$$P_{(r)}/P_{(b)} \times Q_{(b)}P_{(b)} = Q_{(b)} P_{(r)} \qquad (4)$$

These new weights are then applied to price relatives which use the price in the reference period as the denominator to give the following expression

$$100 \times \frac{\sum (Q_{(b)} P_{(r)}) P_{(c)}/P_{(r)}}{\sum Q_{(b)} P_{(r)}} \qquad (5)$$

A5. An example of the way in which this formula (5) is used to produce a price index is given in the Annex to this Appendix.

Application of the Laspèyres principle to the wholesale price index

A6. Having discussed the general expression or formula for a Laspèyres price index the next step is to consider the general principle underlying the calculation procedures adopted for the WPI. Each stage in the calculation will be considered from the basic price relative for an item up to the highest industrial level i.e. 'all manufacturing industries'. At each level it will be seen that the underlying principles produce an index formula which is identical in layout to formula (1) above. The distinction between the base period and reference period has no relevance in this discussion and will be ignored. The formulae will be presented in terms of output indices but the principles apply with equal force to the input indices. There are some differences as between gross sector and net sector indices and each will be discussed separately in turn starting with the gross sector indices.

Gross sector indices

A7. In order to produce a gross sector output index in accordance with formula (3) we need to obtain price relatives and weights. For the weights in the WPI system the starting point is the value of sales in the base year of each product group within the industrial sectors covered by the index. These sales values $(Q_{(b)}P_{(b)})$ are those reported by each respondent in the quarterly inquiries into manufacturers' sales (QSIs). Each product group whose sales are separately distinguished in the QSIs includes a number, sometimes large, of items with some common attributes but often varying widely in price. A potential

contributor to the WPI — and each responder to the QSIs is a potential contributor — could decide, when approached, to submit price quotations for every item within the product group. If he also provided a full set of weights derived from the sales values of each item in the base period they could be applied to the price relatives to give a price index in the following way

$$100 \times \frac{\sum_{i}^{n(q)} (Q_{(b)i} P_{(b)i}) P_{(c)i}/P_{(b)i}}{\sum_{i}^{n(q)} Q_{(b)i} P_{(b)i}} \qquad (6)$$

This formula is in exactly the same form as formula (3), with subscript i referring to each item for which a price quotation is being provided and $n(q)$ being the number of such items within the product group. When comprehensive data is being supplied by the contributor there is a full congruence between the value weights and the price relatives so that the $P_{(b)i}$s in the numerator can be cancelled to give an expression equivalent to formula (1):

$$100 \times \frac{\sum_{i}^{n(q)} Q_{(b)i} P_{(c)i}}{\sum_{i}^{n(q)} Q_{(b)i} P_{(b)i}} \qquad (7)$$

A8. Formula (7) represents a contributor's index; the next stage is to derive an index for a product group by combining a number of these contributors' indices. If each company which had reported sales of a particular product group in the base year were a contributor to the WPI and provided price quotations for every item, then a product group index could be derived conforming precisely with formula (1). The contributor index in (7) would be treated as a price relative and weighted by the contributor's total sales of that product group. As this latter value forms the denominator of formula (7) the two values would cancel and the simplified product group index would take the form:

$$100 \times \frac{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ij} P_{(c)ij}}{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ij} P_{(b)ij}} \qquad (8)$$

where subscript j refers to each of the contributors providing price quotations for that product group and $n(c)$ is the number of such contributors.

A9. Formula (8) relates to indices for product groups. The situation discussed here, in which fully comprehensive coverage is obtained, can be considered to extend to all product groups, all MLHs, and so on for every industrial sector covered by the WPI. The congruence between weights at each successive level of aggregation would produce a series of cancellations resulting in a price index for all manufacturing on the lines of formula (1) as follows:

$$100 \times \frac{\sum_{m}^{n(o)} \sum_{l}^{n(m)_m} \sum_{k}^{n(p)_l} \cdots \sum_{j}^{n(c)_k} \sum_{i}^{n(q)_j} Q_{(b)ijklm} P_{(c)ijklm}}{\sum_{m}^{n(o)} \sum_{l}^{n(m)_m} \sum_{k}^{n(p)_l} \cdots \sum_{j}^{n(c)_k} \sum_{i}^{n(q)_j} Q_{(b)ijklm} P_{(b)ijklm}} \qquad (9)$$

where subscript k refers to each product group and $n(p)$ the number of such product groups within a MLH; subscript l refers to each MLH and $n(m)$ the number of such MLHs within an Order of the SIC; and subscript m refers to each Order of the SIC within the manufacturing sector, of which there are $n(o)$. The dots between the j and k summations allow for intermediate summations of product groups where these occur.

Representativeness of the basic data

A10. The preceding paragraphs have been considering the principles underlying the WPI and formulae (6) to (9) are the price indices which would follow from the conditions put forward in paragraphs A7 to A9. In practice the assumptions upon which these formulae are based cannot possibly be attained — fully comprehensive coverage at all levels is neither practicable nor, in many cases, necessary. A sample only of the many items produced by potential contributors is requested and, for reasons explained in Appendix C, it is not possible to design a sample which can be guaranteed to be free from bias by the application of random sampling techniques. A purposive sample has to be selected from the large number of individual items which comprise a product group and the selection can be made only by the contributor. In order to help the contributor in making his selection the concept of 'representativeness' is used.

A11. Potential contributors are first approached by letter and, if interest is shown, further contact by telephone or, where necessary, by a visit will follow. As part of those early explanatory contacts, the idea of varying price movements is raised and the suggestion is made of stratification of the items within a product group by reference to cost influences. If a company has a limited homogeneous set of items within a product group and adopts a policy of raising simultaneously the price of all those items by a similar proportion then there is only one stratum. In such circumstances one price quotation would 'represent' every item in that product group, although it is found advisable in practice to try to get at least two items so that one can act as a control on the other. In most cases discussions with the contributor reveal that the items within a product group have differing cost influences and a number of strata are identified and items are chosen to 'represent' each of those strata. Where more than one price quotation is offered the contributor may be asked to give an indication of the relative importance (in terms of sales value) of each item, for use as weights in combining the price relatives calculated from the price quotations.

A12. Although the WPI procedure does not calculate a contributor's index but goes immediately to the higher level of a product group index, the former is obviously derivable from the data supplied by each contributor. This

implicit index is the practical equivalent of formula (7). If a proper statistical sample were devised by the contributor and the items chosen by random selection methods, then it would be possible to express the relationship between that sample index and the population index (formula (7)) in terms of expectations. Given the purposive nature of the sample, expectations do not apply and it is impossible to say anything very specific about the degree of representativeness of the sample index. It is hoped however that the guidance given in the initial discussions will have reduced the bias (i.e. the difference between the actual contributor index and formula (7)) to negligible proportions.

The index for a contributor

A13. As has already been mentioned a contributor's index is rarely compiled in practice; the calculations proceed straight to a product-group index corresponding to formula (8). However, contributors' indices are implicit in the calculation procedures and they take the form

$$100 \times \frac{\sum_{i}^{s(q)} V_{(b)i}\,(P_{(c)i}/P_{(b)i})}{\sum_{i}^{s(q)} V_{(b)i}} \qquad (10)$$

where $s(q)$ is the number of sample items for which separate price quotations are being provided and V represents the weights applied to the price relatives. These weights come from one of several bases: they might reflect either the sales values of the individual items whose price quotations form the price relatives, or the sales values of the groups of items which each quotation individually represents; they might be sales values relating to the base period or to the period when the contributor was recruited; they might simply be equal weights because the contributor could suggest nothing more appropriate.

A14. Reverting to the discussion of representativeness above it can now be expressed, in principle, as the ratio of formula (10) to formula (7): the nearer this ratio approximates to unity the greater the degree of representativeness of the contributor's index. Although it is impossible to measure this ratio, it is likely to be close to unity when the data is first supplied. Changes in cost influences over time might cause the original items to become less representative and attempts are made to overcome that problem by periodic reviews of items within the WPI section. The use of sales figures for years other than the base period does not appear to affect the resultant index to any great extent. The reweighting exercise which takes place every five years leaves many of the indices showing much the same movement as on the earlier base, apart from a few fast-growing high-technology industries where items can disappear altogether from production. The WPI system therefore rests upon the assumption that, in most cases,

Formula (10) $\doteqdot$ Formula (7)

The product group index

A15. The method used in compiling the product group indices from the contributors' indices is, in principle, the same as that outlined for the population index in paragraph A8 above. The contributors' indices in formula (10) are treated as price relatives and are combined by weights based on the contributors' total sales of that product group. However in contrast to the population index, there will not be strict congruence between the weights used in the two stages: the weights used to combine contributors' indices relate to the base period whereas the weights for the items might relate to other periods; similarly the former will use the total sales figures whilst the latter may not. In these circumstances the cancellations which are possible in formula (8) are not permissible here, and we are left with the formula

$$100 \times \frac{\sum_{j}^{s(c)} \left[\frac{\sum_{i}^{s(q)_j} V_{(b)ij}\,(P_{(c)ij}/P_{(b)ij})}{\sum_{i}^{s(q)_j} V_{(b)ij}} \sum_{i}^{n(q)_j} V_{(b)ij} \right]}{\sum_{j}^{s(c)} \sum_{i}^{n(q)_j} V_{(b)ij}} \qquad (11)$$

If however we use the assumption, set out in paragraph A14, of effective congruence between the actual and the ideal index, the sum of the sample weights $\sum_{i}^{s(q)}$ can be taken as equal to the sum of the population of weights $\sum_{i}^{n(q)}$ and formula (11) can be simplified to

$$100 \times \frac{\sum_{j}^{s(c)} \sum_{i}^{n(q)_j} V_{(b)ij}\,(P_{(c)ij}/P_{(b)ij})}{\sum_{j}^{s(c)} \sum_{i}^{n(q)_j} V_{(b)ij}} \qquad (12)$$

A16. This last formula follows the general format of formula (3). The weights are values and, as such, they have both the quantity and price components shown in formula (3) although the separation of those two components is not possible from the available data. Formula (12) could be considered to reduce to the simplified layout of formula (1) and to provide an unbiassed estimate of formula (8) if each of the component contributors' indices were unbiassed and if those contributors formed an unbiassed sample of the total population of potential contributors within the product group. The realised sample is dependent upon the voluntary co-operation of the companies approached and tends to concentrate on the larger firms. The use and publication of an index for a product group rests upon the assumption that cost influences on individual items do not vary greatly, so that the price movements of contributors

show small divergences in the longer term. Insofar as this assumption holds then

Formula (11) ≒ Formula (12) ≒ Formula (8)

Higher level indices

A17. The assumption set out in paragraph A16 will be more fully realised in some product groups than in others; if a large producer is not a contributor doubt is cast upon the accuracy of the index for that product group, particularly if the producer is a price-setter, or tends to follow an independent pricing policy. Similar doubts must arise when higher level indices are calculated and a whole product group is missing from the index for a MLH or a complete MLH is missing from the index for an Order. Although proxy indicators may be used (see paragraph 3.8), lack of resources means that there are a number of product groups which are simply assumed to have price movements similar to those of their parent sector. The accuracy of these higher level indices and in particular of the actual equivalent of formula (9) depends upon the assumption that the price movements of the missing areas do not differ, on average, from the calculated index.

Net sector indices

A18. The preceding paragraphs have discussed gross sector indices. All the points discussed there apply with equal force to the net sector indices but they have an additional problem.

A19. When compiling gross sector indices an index at a higher level of aggregation can be derived from the results already obtained for the component indices at the lower level. This connection is clearly demonstrated in formula (9) where each successive stage in the calculation is achieved by a further summation of the same basic items. With the net sector indices however a different method has to be used because the components used to calculate an index at one level will not necessarily be needed for the next level of aggregation. As an example three product groups (within a MLH) might all be sold in full to purchasers who are classified to other MLHs; in such circumstances a net sector index for the MLH would be no different from the gross sector index, with each product having its full weight in terms of value of sales. When calculating the index for the Order of which the MLH forms part however, it might be found that one of the three products is sold mainly to purchasers within that Order, part of a second product similarly but none at all of the third. In compiling the net sector index therefore for the Order the three products would have very different weights from those used for the MLH index, and different from those used to compile a gross sector index for the Order. In other words, the summations appearing in formula (9) will vary from stage to stage and the complete set of basic items need not remain in the calculation throughout each stage.

A20. Although the summations vary from stage to stage, the concept used for the net sector index takes the same general format as those for the gross index. The net sector equivalent of formula (8) is

$$100 \times \frac{\sum_{j}^{n^1(c)} \sum_{i}^{n^1(q)_j} Q_{(b)ij}\, P_{(c)ij}}{\sum_{j}^{n^1(c)} \sum_{i}^{n^1(q)_j} Q_{(b)ij}\, P_{(b)ij}} \qquad (13)$$

where the $n^1(q)$ and $n^1(c)$ shows that some items and product groups respectively have been eliminated from the calculation so that $n^1(q)$ and $n^1(c)$ are respectively less than $n(q)$ and $n(c)$ in formula (8). The net sector equivalent of formula (9) is

$$100 \times \frac{\sum_{m}^{n^5(o)} \sum_{l}^{n^5(m)_m} \sum_{k}^{n^5(p)_l} \sum_{j}^{n^5(c)_k} \sum_{i}^{n^5(q)_j} Q_{(b)ijklm}\, P_{(c)ijklm}}{\sum_{m}^{n^5(o)} \sum_{l}^{n^5(m)_m} \sum_{k}^{n^5(p)_l} \sum_{j}^{n^5(c)_k} \sum_{i}^{n^5(q)_j} Q_{(b)ijklm}\, P_{(b)ijklm}} \qquad (14)$$

Here $n^5(q)$, etc. show that up to five layers of items have been removed from the original number of $n(q)$ to take account of the transactions within the five levels up to the final aggregate for 'all manufacturing'.

A21. Paragraph A20 demonstrates the point made at the beginning of paragraph A19. Although the items appearing in formula (14) also appeared in formula (13) there were many additional items in the latter. Even with the set of items which are common to both formulae, the relative importance might change. Formula (14) cannot be considered as a weighted average of the net sector indices calculated in respect of the component sectors. If there were a connection between transactions and price movements such that, in the compilation, all the lower price movements were eliminated at the next stage, the index for that higher stage could show a movement outside the range of the index of the stage below. Such an occurrence is highly unlikely among the output indices where price movements do not vary widely but it can occasionally happen with the input indices.

A22. The discussion of net sector weights in Appendix B mentions that no data is available to allow for the derivation of such weights below the level of the MLH. In order to operate the net sector concept fully in calculating the WPI, the basic data for within-sector transactions would have to be available at the level of each individual product group. In addition however, contributors would be required to divide their products into separate categories in accordance with the industrial classification of their purchasers. Items being sold for further processing and incorporation into something which would appear under the same product group heading in a sales inquiry should be ignored altogether; the remaining products should be sub-divided by sales within the MLH, sales within the Order, and sales within all manufacturing. In this way the elimination procedures required for formula (14) could be effected. As the data is not available at the lowest levels, and as no attempt is made to divide the contributors' items into different categories, nothing can be eliminated from the indices below the MLH level. The

net sector index actually compiled for a product group takes the same form as those shown at formulae (11) and (12) for the gross sector. In practice nothing is eliminated from the set of basic items until a whole product group is removed at MLH level or above.

A23. As long as a product group index is calculated for incorporation into a net sector index it is calculated gross i.e. the original $n(q)$ and $n(c)$ do not vary. As indices are compiled at the higher levels the requirements of the net-sector approach are allowed for by an adjustment to the weights of the product group indices only. Thus the within-sector transactions of the product group are spread proportionally between all contributors and all items. This procedure is equivalent to assuming that the homogeneity within product groups produces similar price movements among items and contributors and that those price movements are not connected in any way with the purchasers of the items.

A24. In summary therefore the published net sector wholesale price index for 'all manufacturing' depends for its accuracy upon the extent to which the assumptions hold true that:

a the items selected and weights used to combine the basic price quotations result in a price movement with no bias i.e. equal to the average price movement for all items produced by the contributor (paragraphs A13/14);

b the contributors within a product group, although selected by non-random methods, constitute an unbiassed sample of all possible contributors (paragraphs A15/16);

c the proxy indicators representing the important missing product groups/MLHs are well chosen i.e. they have similar price movements to those of the missing product group/MLH (paragraph A17); and

d the price movements for items sold to purchasers within the manufacturing sector do not differ on average from those sold to other purchasers (paragraphs A22/23).

Chain linked indices

A25. Although the WPI is a Laspèyres type of index and therefore uses fixed weights there is a slight departure from this rule in compiling some input indices for reasons explained in paragraph 3.7. There are a small number of product groups which form inputs to some sectors of manufacturing industry and which come both from home-produced sources and from imports. The relative importance of these two sources changes from year to year as can be seen from the published data. This data is therefore used to calculate a form of chain-linked index.

A26. No change in weights occurs in the first-stage indices; they all retain the same weights until a complete revision of the whole weighting system is undertaken. A distinction is always maintained between the imported items of a product group and the home-produced items at the level of a first-stage index. It is when indices for imported and home-produced items need to be combined at some higher level that the attempt is made to use value weights which change from year to year. Referring back to the population indices in earlier paragraphs, formula (8) for a product group — a first-stage index — remains unchanged as far as the weights are concerned. Changes occur when proceeding to the higher levels up to and including formula (9).

A27. In the year of an index series immediately following the base year the base year weights are used and the formulae are as set out in paragraphs A8 and A9. In the following year however new weights are derived for a combination of a number of product group indices and the population index for the first month using the new weights would take the following form:

$$100 \times \frac{\sum_{k}^{n(p)} \left(\frac{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ijk} P_{(c)ijk}}{\sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b)ijk} P_{(b)ijk}} \times \sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b+1)ijk} P_{(b+1)ijk} \right)}{\sum_{k}^{n(p)} \sum_{j}^{n(c)} \sum_{i}^{n(q)_j} Q_{(b+1)ijk} P_{(b+1)ijk}} \qquad (15)$$

where the k summation would refer to the combination of the imported and home-produced items. The transfer to a new set of weights from year (b) to year ($b+1$) precludes any cancellation in the numerator of formula (15). This index would be used in subsequent months until it was time once again to up-date the weights, when those for year $b+1$ in the above formula would be replaced by a new set appropriate to year $b+2$.

A28. If the practical equivalent of formula (15) is applied in the link month (i.e. the first month using the new weights) without any further adjustment, then the movement between the link and preceding months has two causal factors. Part of the change is caused by price movements of the component items and part by the change in weights. In order to preserve as much as possible the primary aim of the WPI, which is to serve solely as a measure of price movements, the second of these causal factors has to be removed. That is done by means of an adjustment factor which effectively links the first month of the new weights to all subsequent months.

A29. There is only one way in which the effect of the change in weights can be removed between the last month with the old weights and the first month with the new and that is to use the old weights again. If we call the first month with the new weights the link month (l) the newly constituted index would take the form

$$100 \times \sum \frac{P_{(l)}}{P_{(b)}} W_{(b+1)} \qquad (16)$$

In this simplified form $P_{(l)}/P_{(b)}$ is equivalent to the first term in the numerator of formula (15) and $W_{(b+1)}$ represents the weighting element in both the numerator and denominator of that formula. As has been said the only way to obtain an index in this link month which shows the required movement is to revert to the old weights. That means that formula (16) must be adjusted by the factor:

$$\frac{\sum \frac{P_{(l)}}{P_{(b)}} W_{(b)}}{\sum \frac{P_{(l)}}{P_{(b)}} W_{(b+1)}} \qquad (17)$$

This factor is applied to the index calculated for each subsequent month in which the new weights are used. For any current month *c* therefore the complete index formula will be as follows:

$$100 \times \sum \frac{P_{(c)}}{P_{(b)}} W_{(b+1)} \times \textit{formula (17)} \qquad (18)$$

This formula can then be rearranged as follows:

$$100 \times \sum \frac{P_{(l)}}{P_{(b)}} W_{(b)} \times \frac{\sum \frac{P_{(c)}}{P_{(b)}} W_{(b+l)}}{\sum \frac{P_{(l)}}{P_{(b)}} W_{(b+1)}} \qquad (19)$$

A30. From formula (19) the linking procedure becomes clearer. The expression on the left is the index for the link month on the original set of weights. The expression on the right is a measure of the price movements between the link month and the current month, using the new set of weights. This procedure is used each year so that, over the life of any index, a number of adjustment factors may be used, chaining the indices forward from year to year by means of the link months.

ANNEX TO APPENDIX A

In order to demonstrate the use of formula (5) in paragraph A4 the procedure will be described whereby, at the time when the wholesale price index is rebased, a second-stage index is compiled from a number of first-stage indices. The procedure at higher levels follows exactly the same pattern.

Let us consider a second-stage index with six first-stage components. At the time of rebasing the index series for each will be rescaled to equate the index for the reference period to 100. A set of indices for the base period, reference period, and any current period are set out for these six first-stage indices in the first table opposite.

	Components					
	A	B	C	D	E	F
Base period $(P_{(b)})$	95.2	95.9	100	90.9	92.8	83.3
Reference period $(P_{(r)})$	100	100	100	100	100	100
Current period $(P_{(c)})$	107.1	108.3	102.1	110.0	107.1	110

At rebasing a new set of weights needs to be compiled from the value figures of sales which are available for the base period. These sales figure $(Q_{(b)}P_{(b)})$ for each of the components are set out in the second table opposite together with the derived percentage weights.

Components	Base period sales $Q_{(b)}P_{(b)}$	Percentage weights $(W_{(b)})$
	£	
A	100	5.6
B	200	11.1
C	250	13.9
D	350	19.4
E	400	22.2
F	500	27.8
	1800	100.0

The next step in the procedure requires the conversion of the weights from base year figures $(Q_{(b)}P_{(b)})$ to reference year figures $(Q_{(b)}P_{(r)})$ by use of the price relative $P_{(r)}/P_{(b)}$ and this calculation is shown in the third table opposite. The final column showing the percentage weights is obtained obviously by dividing each sales value figure $(Q_{(b)}P_{(r)})$ by the total sales value of all components $(\sum Q_{(b)}P_{(r)})$ and we will denote this figure by $W_{(r)}$. The percentage weights $(W_{(b)})$ calculated above in respect of the base year are not used but have been provided simply to show how the weights can change between base and reference periods, depending upon the variation in the price relatives.

Component	Price relative $P_{(r)}/P_{(b)}$	Base period sales $Q_{(b)}P_{(b)}$	Reference period weight $Q_{(b)}P_{(r)}$	Percentage weight $(W_{(r)})$
A	100/95.2 = 1.05	100	105.0	5.3
B	100/95.9 = 1.043	200	208.7	10.5
C	100/100 = 1.00	250	250.0	12.6
D	100/90.9 = 1.10	350	385.0	19.5
E	100/92.8 = 1.077	400	430.8	21.8
F	100/83.3 = 1.20	500	600.0	30.3
			1979.5	100.0

The reference period weights can now be used, in conjunction with price relatives $P_{(c)}/P_{(r)}$, to obtain an index for the current period as shown in the final table opposite.

The percentage weights $W_{(r)}$ can be expressed in full as

$$W_{(r)} = 100 \times \frac{Q_{(b)}P_{(r)}}{\sum Q_{(b)}P_{(r)}}$$

In the shortened form the index value of 108.1 obtained from the above table can be expressed as

$$\sum (P_{(c)}/P_{(r)})\, W_{(r)}$$

In its full form this is

$$100 \times \frac{\sum (Q_{(b)}P_{(r)})\, P_{(c)}/P_{(r)}}{\sum Q_{(b)}P_{(r)}}$$

which is the exact equivalent of formula (5) in paragraph A4.

Component	Price relative $(P_{(c)}/P_{(r)})$		Reference year weight $W_{(r)}$		
A	1.071	x	5.3	=	5.7
B	1.083	x	10.5	=	11.4
C	1.021	x	12.6	=	12.9
D	1.100	x	19.5	=	21.4
E	1.071	x	21.8	=	23.4
F	1.100	x	30.3	=	33.3
					108.1

APPENDIX B

GROSS SECTOR AND NET SECTOR WEIGHTING

Introduction

B1. One of the problems which bedevils any wholesale price index or producer price index which covers a large sector of the economy, such as all manufacturing industry, is the problem of the multiple counting of price movements. As an example consider the situation which can arise when a particular type of steel, as used in the manufacture of ball-bearings, becomes more expensive. The price index for the steel will rise but in addition this increase will show up in the indices for the ball-bearings, the motor into which they may be incorporated, and the machine tool of which the motor forms part. Each of these consequential price changes would have a smaller effect than the previous one and would occur with a lag which depended upon the speed of the manufacturing process. An aggregate index for 'all manufacturing' which included each of these component indices would be very difficult to interpret and would be susceptible to structural changes within the sector (e.g. if the ball-bearing manufacturer took over the steel fabricator and eliminated from the market the transaction involving the purchase of steel, the index for that particular type of steel could perhaps disappear altogether, thus affecting the aggregate index).

B2. When the wholesale price index was reconstructed in the 1920s and based upon the data collected in the 1907 Census of Production an attempt was made to reduce the problem of multiple counting by compiling indices for three processing stages, one relating to the basic materials, the second covering intermediate products (any item other than a basic material which was sold for further processing), and the third for finished manufactures. This procedure did reduce the problem, particularly with the basic materials index, but it introduced a new difficulty of defining and clearly distinguishing these stages. Some items — batteries, electric motors, pumps — can be purchased by other manufacturers for incorporation into larger units, making them intermediate goods, or by private consumers, in which case they should be classified as finished manufactures. In addition the problem still remained of structural changes affecting the index.

B3. When the present system was set up in 1950 the problem was tackled from another angle. The intermediate products index was abandoned and two indices only were set up, one to measure the price movements of inputs of raw materials and fuel and the other to measure the price movements of final outputs. In addition however the method by which the many component indices were combined to produce an aggregate index was changed from a gross sector to a net sector basis. The earlier aggregate indices for the three processing stages had been produced by combining the component indices with weights proportional to the value of total sales of the item in the United Kingdom market without any regard for the destination of the purchased item. As the weight of the component index was related to the gross sales of the item this is referred to as a gross sector method. Under the system used since the 1950s, a 'ring fence' has been placed around each sector for which an index is required and that index only includes price movements in proportion to the value of transactions which cross that ring fence. All the transactions which take place within the ring fence are eliminated or netted-out by methods described below. It is therefore described as the net sector method.

B4. Referring back to the example in paragraph B1, an output index for 'all manufacturing' would include only the final sale of the machine tool: all the other transactions, although outputs for their own specific sector, would be considered as intermediate transactions occurring within the 'all manufacturing' ring fence. Similarly the input index would only consider the transaction involving the original purchase of the raw steel. An output index for the mechanical engineering sector (Order VII) would include the price movements of the ball-bearings and the machine tool because both of these transactions had crossed the ring fence, the first going to the electrical engineering sector (Order IX) for incorporation into the electric motor and the second going to a final buyer. An input index for the same sector would include price movements in respect of the steel — purchased by the ball-bearing manufacturer — and of the electric motors — purchased by the machine tool manufacturers.

B5. The description of inclusions and exclusions in paragraph B4 applies only to the specific example in paragraph B1. It is not necessarily the case that all transactions involving the purchase and sales of ball-bearings and electric motors are ignored when compiling the input and output indices for 'all manufacturing'. Reference has already been made to goods which can either form part of an intermediate or a final transaction; ball-bearings and electric motors both fall into this category and, to the extent that they do cross the ring fence, their price movements will be incorporated into the aggregate index. Similarly finished steel, ball-bearings, and electric motors could all form part of the input index for 'all manufacturing' if they are purchased from abroad. The construction of net sector price indices was simpler in the days when British industry imported only raw materials. The growth in imports of semi-manufactures has led to difficulties in using the purchases data (see paragraph B15 below) and extended the amount of work needed

to obtain full coverage of price quotations.

B6. Thus the difference between a gross and a net index for any sector is that in the latter we remove (or net out) within-sector transactions and are left with only the between-sector transactions. The net index provides a much clearer distinction between an output and an input index, unlike the gross index where an item like an electronic component can appear as both input and output for the electrical engineering sector. It should not however be assumed that net indices are always to be preferred to gross: the choice of type of index depends upon the use to be made of it. Those who use the index as a deflator of value figures (e.g. sales) will need a gross index because the value figures themselves are on a gross basis. Those who are interested in prices as a general economic indicator will look to the net indices.

B7. Having described the principles underlying the compilation of the WPI the rest of this appendix is devoted to a description of the methods by which those principles are put into practice, the data sources used, and the conceptual and practical problems encountered.

Practical definitions of indices

B8. A general description of the principles adopted in the WPI system has been given above. The principle of netting out is effected by producing a set of weights relating to transactions across the ring fence. These weights are derived from three major sources of statistical data: the quarterly inquiries into manufacturers' sales (QSIs) and the quinquennial inquiries into purchases of materials and fuel by manufacturing industry (PI), both of which are conducted by the Business Statistics Office; and imports and exports data extracted from the statistics on overseas trade (OTS) as collected by Customs and Excise. With these data sources in mind we can define the weight for any sector as follows:

Gross sector output weight	=	Total sales of principal products *less* sales of products for export. (This total includes sales of products to purchasers within the same sector and sales to United Kingdom purchasers outside the sector.)
Net sector output weight	=	Total sales of principal products *less* sales of products for export and *less* sales to purchasers within the same sector.
Gross sector input weight	=	Total purchases of materials and fuel from United Kingdom producers *plus* total purchases from abroad. (This total includes purchases of materials and fuel from producers within the same sector and purchases from producers outside the sector.)
Net sector input weight	=	Total purchases of materials and fuel from United Kingdom producers *less* purchases from producers within the same sector and *plus* purchases from abroad.

B9. Two points should be made about the definitions set out above and indeed about the general concept of a net sector price index. Firstly, as can be inferred from the two output definitions, no attempt is made in the output indices to consider the price movements of items which are exported even though they relate to transactions which pass through the ring fence: the WPI is concerned to measure price movements of United Kingdom products sold in the home market and the indices are often referred to as home sales indices. Secondly, the net sector approach is not applied to transactions involving capital goods; by general economic convention such items are classified as final goods and therefore automatically pass to a different sector of the economy.

B10. The operational definitions given in paragraph B8 above provide the basis of the reweighting exercise which is undertaken every five years when a purchases inquiry is held and a new base year is adopted within the national accounts. In this exercise a whole new hierarchy of weights is derived for the WPI, from those required for compiling each first stage index right through to those needed to combine all the component indices which form part of the all manufacturing aggregate. By way of illustration a description will now be given of the procedures adopted in deriving weights for the 1975 = 100 series.

Output weights

B11. The starting point for the output indices was to produce weights for the first-stage indices i.e. the product indices formed by combining price quotations from individual contributors. Where it was available, information was provided to the WPI statisticians on the sales by each individual contributor of the appropriate product group, and this sales data formed the basis of the weights used to compile these first-stage indices. However, at this low level of aggregation the definitions set out in paragraph B8 could not be followed rigorously. Firstly, there was no data available by which to determine the amount of within-sector transactions at the product group level, although it was thought to be very small, and so no attempt was made to calculate both a gross and net index. Secondly, no attempt was made to base the weights on home sales rather than total sales; the data needed to do so was usually not available. Even if it were it would be difficult to justify the extra work involved in deriving the theoretically more correct weights as any change in the index resulting from the work would be well within the existing margin of error. The compilation of these first-stage indices is therefore based upon the assumptions that (a) for both gross and net indices the total sales pattern is a sufficiently accurate indicator of the home sales pattern and (b) any within-sector transactions would produce a trivial

difference between the gross and the net sector indices.

B12. The complete range of first-stage indices thus compiled formed the basic building blocks for all higher level indices both in the input and the output series. For the output series the weights for all higher level indices were derived from the published sources referred to in paragraph B8. To obtain the gross sector weight the total sales figures for all the product groups forming the higher level aggregate were first obtained from the QSIs. These totals included both home and export sales so the next step was to eliminate the latter. In a few cases the QSIs included separate headings for export sales and here the derivation of home sales was comparatively straightforward. In most cases however no separate export figures were collected by the Business Statistics Office and it was necessary to use the commodity breakdown in the OTS. Even when comparable figures of total sales and export sales were collected by the Business Statistics Office difficulties arose because the amount of detail was often lower for export sales; when the OTS had to be used rather than the QSIs there were the added difficulties of difference in coverage, commodity description, recording, valuation and timing between the two sets of figures. However these inconsistencies in the data were most prevalent at the lower levels of aggregation where the indices are not very sensitive to small changes in the weights so the data deficiencies are not thought to have produced significant inaccuracies in the results. This method was therefore used to produce the whole hierarchy of gross sector output weights right up to the 'all manufacturing' level.

Netting out

B13. Having produced the figures of gross home sales the next stage involved the calculation of the net weights. As can be seen from the definitions in paragraph B8, these calculations required that the total home sales be reduced by the value of sales to customers within the same sector. If the theoretical basis of the net sector approach had been applied fully, the identification and elimination of within-sector transactions would have begun at the very lowest level i.e. at the level of the individual contributor, because the sales figures collected by the Business Statistics Office include transfers of goods between establishments within a company. In practice however, the limitations of the data meant that this exercise had to start at the level of the MLH; although sales data is provided at product group level, the classification of the purchasing establishments does not go below MLH level. For each of the product groups comprising a MLH, four figures were needed — the proportion of home sales which were sold to (or purchased by):

1 establishments classified to the same MLH,

2 establishments classified to any one of the MLHs in the same Order,

3 establishments classified to the manufacturing sector, and

4 establishments classified to the manufacturing sector other than Order III (Food, drink and tobacco).

B14. The first stage of the exercise to derive these porportions was tantamount to the production of an input/output matrix with a greater number of rows and columns than is normally available in officially published tables. The data sources were the 1974 QSIs and PI. This latter inquiry provided an analysis for the establishments classified to each census industry (MLH) of their purchases, by type of commodity and by value. Thus for each industry, the industrial source, or point of origin, of each of its purchases was determined in terms of its MLH. Having analysed the purchases data according to the MLH from which the product ostensibly came, it was then rearranged to show, for each MLH, the sales figures broken down according to the MLH of the purchaser.

B15. In other words the data on purchases *by* industries of commodities, was transposed to produce data on the sales of intermediate products *to* industries. A major drawback to using transposed purchases inquiry data in order to classify sales data according to the industrial destination of those sales lay in the fact that the PI did not distinguish between purchases of domestically produced products and imported products. That meant that the sales figures produced by the transposition method described above were sales in the home market by both home and foreign establishments. The data needed to divide these total figures into their two separate components do not exist so the assumption was adopted in this exercise that the industrial distribution of the total figure (home produced *plus* imported goods) also applied to both of those components.

B16. It is now possible to see from the description given above that, in practice the definition of the net sector output weights was as follows:

Net sector output weight	=	Total sales of principal products *less* sales of principal products and *less* purchases from United Kingdom producers within the same sector.

B17. By this first stage in the exercise figures were obtained of the proportions of the total output of the MLH which should be netted out at each level of aggregation up to 'all manufacturing'. This overall proportion for the MLH had then to be allocated among the product groups which comprised the total MLH. For instance the input/output data in the first-stage exercise might have shown that, of the total sales of products within one MLH, 20 per cent was purchased by establishments classified to the same MLH, 35 per cent by establishments classified to MLHs within the same Order, and 65 per cent by establishments classified to MLHs within 'all manufacturing'. In the second stage these three proportions were spread between the groups of products which comprised the MLH. There was much less data available to help with this part of the exercise which relied heavily upon knowledge of the industry and informed judgements, although an examination of the detail in the PI did help in some sectors. Where a particular product group was identifiable in the PI analysis it might show that it was all sold to establishments outside its own MLH but within its own Order of the SIC. In those circumstances the product group index would return its full sales-value weight in the MLH net sector index but would have no weight at all in the index for the Order. In this second stage of the exercise therefore each of the product groups was assigned a set of weights to be used in compiling the indices at the various levels of aggregation.

B18. It is obvious that as the index calculation proceeds to higher levels of aggregation and the sector under consideration grows larger, the amount of netting-out increases. A group of products which are quite important at the MLH level can reduce considerably and even disappear altogether at Order or 'all manufacturing' level.

The reduction process is uneven in its effect upon different sectors with the result that the MLH with the largest weight in the Order index might be among the least important in the 'all manufacturing' index. The netting effect, and its variability, is demonstrated in Table A at the end of this appendix.

B19. This table shows the figures from which the net sector output weights are derived for the index for 'all manufacturing'. The first column of figures gives the gross home sales of each sector, as derived by the methods described in paragraph B12. The second and third columns show respectively the percentage of those sales going outside the parent SIC Order and the percentage going outside the manufacturing sector. Overall 60 per cent of gross home sales of establishments in the manufacturing sector go to purchasers outside that sector with considerable variation between sectors. Order XV (Clothing and footwear) makes 96 per cent of home sales outside manufacturing whilst Order VI (Metal manufacture) sells only 8 per cent. At the lower level sectors like MLH 411 (Production of man-made fibres) and MLH 415 (Jute) sell all of their output to purchasers within the manufacturing sector (indeed 97 per cent of home sales of man-made fibres go to establishments within the same Order); at the opposite end 100 per cent of the sales of MLH 396 (Jewellery and precious metals) and MLH 433 (Fur) go outside the manufacturing sector. The net sector output weighs for the 'all manufacturing' index are given in the fourth column: these weights are obtained by applying the percentages in the third column to the sales figures in the first column and reducing them to percentages.

Input weights

B20. The same basic data — the price quotations and first-stage indices built up from them — are used for the input and output price indices. The products covered by the first-stage indices will, in many cases, represent the output or sales of one sector and the input or purchases of another. If the requirements set out in paragraph 4.4 were strictly adhered to, different price quotations would be needed for the two series but, in the main, the same first-stage indices are used in compiling the aggregate indices for both input and output. There are however some differences in the two procedures and in the actual indices compiled.

B21. The first point of difference is that no gross sector input indices are produced at any level — the use of the gross sector output indices as deflators is not repeated with input data. In addition no input indices are compiled below MLH level and there are very few even at this level. Industrial establishments are not classified to any grouping below this level so purchases data are not available from which to calculate any lower level indices. A few input indices are compiled and published at the MLH level but, in the main, it is at the Order and the 'all manufacturing' level that most are available.

B22. As with the net sector output indices the purchases inquiry provided the primary data source by which the transactions between the various sectors within manufacturing could be measured. The industrial source of each product separately distinguished in the purchases inquiry (i.e. the MLH which includes that product as one of its principal products) was identified, allowing a distinction to be made between inputs or purchases emanating from manufacturers classified within the same sector (be it MLH, Order or 'all manufacturing') and inputs emanating from manufacturers classified to other sectors. The main difficulty in this part of the exercise arose from the fact that the purchases inquiry did not distinguish between purchases from United Kingdom producers and purchases through imports. This has already been mentioned in paragraph B15 as a problem in the estimation of net sector output weights and it was no less of a problem with the input weights. As an example purchases of steel by the tubemakers should have been netted-out of the input index (i.e. the price quotation should have a zero weight) if the steel was produced in the United Kingdom but should have been retained if the steel had been imported; the available data did not help with this allocation problem. In practice therefore the assumption was made that the imports share in the total value across all sectors of imports and home-produced sales of a product applied to each individual sector.

B23. The netting-out procedures were somewhat more straightforward for the input weights than the output, leading to a greater degree of simplification at the higher levels of the input indices. In the net sector output system the weight for a product was reduced to the extent that its sales went to producers in the same sector and the degree of reduction in that weight could vary between zero and 100 per cent. For the input indices however a product purchased from within the same sector would be completely eliminated and would automatically carry a zero weight. Thus at the 'all manufacturing' level the output index could include quite a large number of products which, although very largely traded within the manufacturing sector, nevertheless are sold in small amounts to other sectors such as mining and quarrying or construction. These products would all have very small weights in the output index and will help to swell the numbers of first-stage indices in the 'all manufacturing' output index. With the input index however products are either fully included to the extent of their total purchases value by that sector or they are completely eliminated. The 'all manufacturing' input index therefore has a smaller number of first-stage indices than the output index.

B24. The figures used in deriving net sector input weights are shown in Table B at the end of this appendix. The same structure cannot be adopted here as in Table A because the basic products, which appear once only in their appropriate MLH in the output index, can appear as inputs to many MLHs. Table B therefore confines itself to showing how the 1974 gross purchases, shown in the first column of figures, are reduced as the index is calculated at Order level and 'all manufacturing' level. The second column shows the percentage of gross purchases which were estimated to have been manufactured by establishments outside the parent Order. This percentage varies greatly from 97 per cent for Order XV (Clothing and footwear) to 36 per cent for Order XIII (Textiles). The third column shows the percentage of the gross purchases which were estimated to have been made by establishments classified to the 'all manufacturing' sector. Here again there is a good deal of variation: at one extreme, Order XV (Clothing and footwear) is almost entirely dependent upon other parts of the manufacturing sector for its inputs (very largely textiles) and at the other, Order IV (Coal and petroleum products) obtains 91 per cent of its inputs from outside the sector. This third column shows that quite a large part of manufacturing (particularly Orders VII-XI) derives most of its inputs from other parts of the

sector; as can be seen from a comparison of the total purchases figures at the bottom of columns 1 and 3, about two thirds of gross purchases are netted out in arriving at the weights for the 'all manufacturing' input index.

Input price indicators

B25. Although it is not strictly relevant to a discussion of weighting procedures, an integral part of the whole reweighting exercise was the allocation of suitable price indicators to the products described in the purchases headings. Where commodities had been purchased entirely from abroad import price indices were required and attempts had already been made to obtain price quotations to cover those items. Where the purchased items were home-produced they were also outputs of various home sectors and, in principle, suitable price indicators should have been available from among the output price indices. Where there was full congruence between a product heading in the 1974 purchases inquiry and one in a quarterly sales inquiry the output price indicator was readily available. In most cases however this complete congruence was not present and the output index which appeared to correspond most closely to the purchases heading was chosen. Some purchases headings were too vague and all-embracing to allow for the identification of an appropriate output price indicator and were disregarded; others were too small in value to be worth including. Apart from these two exceptions, every purchased product was assigned a suitable price indicator and a weight appropriate to each level of aggregation of the input index.

Methodological weaknesses

B26. Some of the weaknesses present in the system described in the foregoing paragraphs have already been touched upon. Most of them derive in some way from deficiencies in the data sources and these deficiencies are inherent in any statistical inquiry system. In addition to those already mentioned the data itself has already been subjected to a number of estimation processes within the Business Statistics Office. In order to reduce the form-filling burden neither the PI nor the QSI cover the smallest firms, nor do they obtain full response from those they do cover. To allow for these deficiencies therefore estimates are incorporated into the totals used in deriving the weights and, whilst those estimates might be reasonably accurate at aggregate levels, they could be much less accurate for individual products.

B27. A further problem arises as a result of the 'product' and 'industry' concepts. Output indices are produced to represent a particular sector — a MLH, an Order, or some other aggregate. Each of these sectors is defined within the SIC by means of a list of the 'principal products' of that sector, and a gross sector output index is compiled by combining the price indices for each of those principal products in accordance with the total sales figures in the base or reference year. Thus under this 'principal products' approach the aggregate output indices are, strictly speaking, product indices rather than industry indices. When we speak of an industry we are normally referring not to a collection of products but to a group of establishments. This group of establishments has been classified to an industry because their products are mainly, but not exclusively, to be found among the principal products of that industry. In practice some of the principal products which define one industry are produced by establishments classified to other industries (carry-in) and conversely establishments classified to one industry manufacture products which are the principal products of other industries (carry-out). This crossing of boundaries between products and industries is ignored in deriving the WPI weights because the QSI totals, which form the basis of the weights, are product totals; the PI totals, which are then used to net out the within-sector product transactions, are part industry and part product based. Thus the normal concept of a sector — the aggregation of sales of all products, whether principal or otherwise, by establishments classified to an industry — is not the one used in practice; the data available produces a mixed situation in which the sector hovers between product and industry. The situation is not so mixed for the input weights as the data sources are confined to the PI and imports whereas the net output weights also use the QSIs.

B28. Data deficiencies also lead to a dilution of the netting-out system. In order to be entirely consistent the net sector approach should be used at every level of index calculation. It has already been mentioned that net sector calculations were confined to MLH level and above. All indices at levels below MLH are gross sector indices and they are incorporated into the higher level net sector indices. There is here therefore a departure from the pure concept of a net sector index and it affects both input and output indices. Many of the headings used in the purchases inquiry and therefore in the input indices call for a price indicator which is below the MLH level and which is therefore a gross index. The same is true on the output side since any net output index at whatever level is a weighted combination of the basic building blocks, which are gross indices. The price quotations themselves represent a whole range of items which should be netted out at different points in the aggregation process but, in practice, they all remain in the index together and are all eliminated together. We thus have a system which combines gross price information by means of net weights.

B29. In compiling the WPI the practice falls short of the theory in several ways. As with all other official statistics, compromises have to be made in adapting the concept to the real world. The compromises outlined in this appendix are not thought to have seriously impaired the efficacy of the indices.

Derivation of net sector output weights

TABLE **A**

Order	MLH	Home sales: Gross (£ million)	Percentage of home sales sold outside: Own Order	Percentage of home sales sold outside: All manufacturing	Percentage weight at level of all manufacturing
	211	604	*34*	*34*	*0.6*
	212	779	*95*	*95*	*2.2*
	213	330	*95*	*95*	*0.9*
	214	1,207	*92*	*92*	*3.3*
	215	1,236	*89*	*89*	*3.3*
	216	709	*39*	*39*	*0.8*
	217	674	*95*	*95*	*1.9*
	218	702	*93*	*93*	*1.9*
	219	864	*95*	*95*	*2.5*
	221	330	*45*	*20*	*0.4*
	229	723	*93*	*92*	*2.0*
	231	1,095	*92*	*91*	*3.2*
	232	287	*93*	*87*	*0.9*
	239	121	*92*	*91*	*0.3*
	240	1,784	*99*	*99*	*5.7*
III	**Sub-total**	11,445	*86*	*85*	*29.9*
	261	435	*98*	*60*	*0.8*
	262	3,895	*96*	*65*	*7.6*
	263	263	*99*	*9*	*0.1*
IV	**Sub-total**	4,593	*96*	*61*	*8.5*
	271	1,435	*32*	*9*	*0.4*
	272	403	*73*	*68*	*0.8*
	273	265	*97*	*97*	*0.8*
	274	386	*99*	*73*	*0.9*
	275	306	*85*	*82*	*0.7*
	276	751	*87*	*0*	*0*
	277	86	*96*	*1*	*0*
	278	290	*95*	*88*	*0.8*
	279	475	*87*	*57*	*0.8*
V	**Sub-total**	4,397	*69*	*39*	*5.2*
	311	3,200	*62*	*7*	*0.7*
	312	347	*81*	*18*	*0.2*
	313	590	*92*	*15*	*0.3*
	321	636	*63*	*6*	*0.1*
	322	857	*63*	*7*	*0.1*
	323	460	*64*	*8*	*0.1*
VI	**Sub-total**	6,090	*66*	*8*	*1.5*
	331	109	*99*	*99*	*0.3*
	332	160	*94*	*90*	*0.5*
	333	314	*66*	*54*	*0.5*
	334	138	*53*	*25*	*0.1*
	335	79	*88*	*88*	*0.2*
	336	408	*92*	*92*	*1.1*
	337	361	*94*	*91*	*1.0*
	338	59	*99*	*99*	*0.2*
	339	893	*98*	*96*	*2.7*
	341	766	*85*	*81*	*2.0*
	342[1]	—	—	—	—
	349	394	*25*	*0*	*0*
VII	**Sub-total**	3,681	*92*	*84*	*8.7*
	351	9	*93*	*93*	*0*
	352	28	*92*	*90*	*0.1*
	353	65	*100*	*100*	*0.2*
	354	288	*96*	*75*	*0.6*
VIII	**Sub-total**	390	*96*	*80*	*0.9*

Derivation of net sector output weights

TABLE **A** *continued*

Order	MLH	Home sales	Percentage of home sales sold outside		Percentage weight at level of all manufacturing
		Gross (£ million)	Own Order	All manufacturing	
	361	568	*77*	*31*	*0.6*
	362	405	*77*	*61*	*0.6*
	363	350	*97*	*85*	*0.9*
	364	479	*25*	*16*	*0.2*
	365	428	*100*	*99*	*1.3*
	366	181	*98*	*98*	*0.5*
	367	295	*97*	*92*	*0.9*
	368	302	*100*	*99*	*0.9*
	369	517	*90*	*56*	*0.9*
IX	**Sub-total**	3,525	*81*	*64*	*6.8*
X	**Sub-total**[1]	—	—	—	—
	380	115	*70*	*70*	*0.3*
	381	2,364	*77*	*76*	*5.5*
	382	27	*85*	*85*	*0.1*
	383[1]	—	—	—	—
	384/5	83	*100*	*100*	*0.2*
XI	**Sub-total**	2,589	*77*	*76*	*6.1*
	390	214	*87*	*27*	*0.2*
	391	56	*99*	*80*	*0.1*
	392	45	*96*	*96*	*0.1*
	393	186	*87*	*17*	*0.1*
	394	505	*73*	*20*	*0.3*
	395	273	*99*	*6*	*0.1*
	396	107	*100*	*100*	*0.3*
	399	1,498	*95*	*50*	*2.2*
XII	**Sub-total**	2,884	*90*	*40*	*3.4*
	411	477	*3*	*0*	*0*
	412	443	*20*	*9*	*0.1*
	413	289	*87*	*0*	*0*
	414	753	*44*	*20*	*0.4*
	415	50	*20*	*0*	*0*
	416	44	*91*	*83*	*0.1*
	417	634	*97*	*74*	*1.3*
	418	19	*76*	*35*	*0*
	419	323	*99*	*96*	*0.9*
	421	73	*80*	*9*	*0*
	422	170	*99*	*96*	*0.4*
	423[1]	—	—	—	—
	429	114	*95*	*58*	*0.2*
XIII	**Sub-total**	3,389	*60*	*37*	*3.4*
	431	142	*75*	*26*	*0.1*
	432	64	*100*	*92*	*0.1*
	433	1	*100*	*100*	*0*
XIV	**Sub-total**	207	*83*	*46*	*0.2*
	441	73	*100*	*100*	*0.2*
	442	292	*100*	*100*	*0.9*
	443	212	*100*	*100*	*0.6*
	444	183	*100*	*89*	*0.5*
	445	447	*99*	*99*	*1.2*
	446	24	*96*	*96*	*0.1*
	449	130	*99*	*99*	*0.4*
	450	389	*97*	*90*	*1.0*
XV	**Sub-total**	1,750	*99*	*96*	*4.9*

Derivation of net sector output weights

TABLE **A** *continued*

Order	MLH	Home sales	Percentage of home sales sold outside		Percentage weight at level of all manufacturing
		Gross (£ million)	Own Order	All manufacturing	
	461	260	*95*	*70*	*0.6*
	462	128	*88*	*54*	*0.2*
	463	332	*96*	*49*	*0.8*
	464	191	*70*	*66*	*0.4*
	469	808	*97*	*84*	*2.2*
XVI	**Sub-total**	1,719	*93*	*71*	*4.3*
	471	842	*64*	*85*	*1.2*
	472	642	*95*	*90*	*1.7*
	473	141	*98*	*95*	*0.4*
	474[1]	—	—	—	—
	475	102	*100*	*64*	*0.2*
	479	170	*60*	*36*	*0.2*
XVII	**Sub-total**	1,897	*79*	*68*	*3.7*
	481	775	*83*	*11*	*0.3*
	482	902	*95*	*19*	*0.5*
	483	303	*44*	*43*	*0.4*
	484	320	*93*	*78*	*0.8*
	485	749	*100*	*100*	*2.3*
	486	392	*100*	*100*	*1.2*
	489	1,101	*93*	*90*	*3.1*
XVIII	**Sub-total**	4,542	*80*	*61*	*8.7*
	491	666	*95*	*64*	*1.3*
	492	97	*96*	*43*	*0.1*
	493	43	*93*	*84*	*0.1*
	494	177	*99*	*98*	*0.5*
	495	59	*85*	*84*	*0.2*
	496	954	*96*	*48*	*1.3*
	499	96	*90*	*80*	*0.2*
XIX	**Sub-total**	2,092	*95*	*60*	*3.8*
All manufacturing		55,191	*82*	*60*	*100*

[1] For various reasons, mainly associated with difficulties in obtaining satisfactory price quotations, there are no wholesale price indices for these sectors.

Netting-out of purchases for input index

TABLE **B**

SIC Order	Total purchases	Percentage of total purchases from outside:	
	Gross (£ million)	Own Order	All manufacturing
III	8,706	*72*	*56*
IV	4,950	*93*	*91*
V	4,965	*53*	*24*
VI	4,598	*55*	*41*
VII	3,946	*71*	*8*
VIII	448	*88*	*6*
IX	3,199	*66*	*6*
X	460	*75*	*9*
XI	3,756	*70*	*6*
XII	2,413	*81*	*17*
XIII	2,659	*36*	*19*
XIV	227	*75*	*52*
XV	1,030	*97*	*2*
XVI	976	*84*	*33*
XVII	1,586	*77*	*48*
XVIII	2,509	*40*	*24*
XIX	1,460	*91*	*16*
Total (£ million)	47,888		16,231

APPENDIX C

SAMPLING PROCEDURES WITHIN THE WHOLESALE PRICE INDEX

C1. Altogether about 2,500 contributors provide 10,000 or so price quotations to serve as the raw data from which the wholesale price index is compiled. As the number of possible contributors runs into many thousands and the number of separate items for which price quotations could be supplied is even higher, it is obvious that the WPI is based upon a small sample of the total population. When compiling estimates from small samples there are strong reasons for following statistical sampling theory and using random selection procedures if at all possible; in fact the WPI methods of selection are much less rigorous and much more purposive than those recommended in text-books. This appendix considers the WPI procedures and contrasts their advantages and disadvantages with those associated with probability sampling.

C2. All samples are designed with the same basic aim in mind — the collection of a limited amount of data from which estimates of population parameters can be calculated. For the WPI the population parameter is the average price movement of all products and an estimate of this parameter is obtained from the price quotations in the sample. If the WPI sample had been designed and selected according to random sampling methods (defined as a method by which each and every member of the population has a calculable and non-zero chance of selection) no bias would be present in the selection system and, provided that there was full response, a standard error with a clearly understood meaning could be calculated. A sample known to be unbiassed would be a great asset. In addition the ability to determine the limits within which the population parameter lies (at a given confidence level) would be a very useful piece of information. It is therefore worth considering the circumstances required to achieve a true probability-based sample of price quotations.

C3. The basic sampling units are the items for which price quotations are to be collected. These items are already classified to product groups and the sales data are supplied to the Business Statistics Office by individual manufacturers so the basis of a stratified two stage sample is, in principle, present. Two sampling frames would be needed: the first would be a list of all United Kingdom manufacturers stratified by reference to each product group for which sales data is available; the second would be a list of all items sold on the home market in the base year by those manufacturers selected at the first stage. These two frames would form the basis of a stratified two-stage sample with the probability of selection proportional to the size (sales value) of the manufacturer and the item within the product group stratum.

C4. A frame of manufacturers is available in the shape of the respondents to the Business Statistics Office quarterly inquiries into manufacturers' sales and a separate list can be provided for each product group. The sales values are available for the base year so that the first stage of sampling with probability proportional to size could be done. This frame is not perfect: the very small firms are not included in the quarterly inquiries and there are a few sectors within manufacturing for which quarterly inquiries do not exist. Nevertheless this list could be regarded as a satisfactory sampling frame for most of the sectors covered by the WPI. The second frame — a complete list of items manufactured by each respondent to the quarterly sales inquiries — almost certainly does not exist except for a small number of manufacturers. If, however, it were possible to obtain such a list from the selected manufacturers, showing the sales value of each item in the base year, then a probability-based sample of items could be chosen. The price quotations could all be weighted together according to their probabilities of selection to give an unbiassed estimate of the current cost of the basket of goods appropriate to each product group (stratum) as well as a measure of the precision of those estimates in the form of 'standard error' calculations and confidence intervals.

C5. Although the advantages of random sampling are considerable the full data required for its implementation simply do not exist and could not be provided except at great cost. A satisfactory first-stage frame is fairly readily available but the second-stage frame would require that the selected establishments provide a complete list of all their products and the relevant sales data so that a proper random selection could be made. Such a requirement would obviously place a very heavy burden on potential contributors; innumerable administrative and statistical questions would arise from changes in specifications; the disappearance of old items and the emergence of new ones would pose resampling problems. The statistical gains from probability sampling would be at the expense of much greater costs.

C6. A further difficulty would arise from the application of probability sampling methods because the inquiry would have to be made compulsory in order to preserve the lack of bias i.e. manufacturers would have to send in details of the selected price quotations whether they liked it or not. Such an inquiry would contrast strongly with the present system and would raise more problems than it would solve. Although the voluntary nature of the inquiry means that some product groups do have inadequate samples there is no reason to suppose that the index would be improved by making the inquiry compulsory. Apart from the inherent difficulties of short-term compulsory or 'statutory' inquiries, the assistance of contributors is absolutely essential in such matters as the initial selection of suitable price quotations, notification of changes in specification, and replacement of discontinued items. The publication of timely and reliable indices is possible only because contributors are willing to co-operate in providing this extra help. A change from a voluntary to a compulsory inquiry would alter the relationship between contributors to the WPI and the Department almost certainly to the detriment of the index.

C7. The system of selection used adheres as closely as possible to the staging and stratification procedures

outlined above but without making use of probability methods in taking samples. The list of establishments is supplied by the Business Statistics Office, classified according to the various product groups. This list or these lists are used in the selection of potential contributors although the actual method of selection is judgemental and tends to concentrate on the larger suppliers of the product concerned — a rough approximation to probabilities proportional to sales value. In those sectors where co-operation is forthcoming therefore it is likely that the sample of contributors actually achieved does not differ greatly from the sort of sample that would have emerged from the application of random selection processes at this first stage.

C8. The area in which the actual selection procedure is furthest from that suggested by the theory is in making a choice from the whole range of items manufactured and sold by the potential contributors. The sample is obtained very largely through the exercise of judgment by the contributor both as to the number and type of items, although it is a guided judgment arrived at after the aims of the WPI have been explained and such matters as pricing policy, discounts, relative size of sales, etc. have been considered. It is impossible to be sure what kind of a sample arises from this method and how it compares with a randomly selected sample of items; it is probably safe to say however that the price movements selected by contributors will tend to cluster more closely round the average and will include a smaller proportion of 'outliers' than would a random sample. If the high and low outliers were equally under-represented the actual sample of items within a product group would have a small bias. The standard error would obviously vary depending upon the homogeneity of items within a product group but, if one were calculated from the actual sample data, it would probably be smaller than the 'true' standard error because of the under-representation of the outliers.

C9. The practical problems involved in attempting to use a probability-based sample here led to a more purposive approach to the selection of contributors and items for the WPI. Nevertheless, although the letter of statistical sampling theory is not followed, efforts are made to adhere as closely as possible to the spirit of that theory. The realised sample is based upon two important elements of the theory: that an increase in the size of the sample increases the accuracy of the estimate of the population parameter at the product group level; and that stratification into homogeneous product groups in both the sampling and the calculations increases the precision of the estimates of the indices at the higher levels of aggregation.

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APPENDIX E

SPECIMEN TABLES AS PUBLISHED IN BRITISH BUSINESS

Statistics

Wholesale price indices in September

Output prices

The price index for the home sales of manufactured products increased by 1 per cent between August and September to 178.2 (1975 = 100). The change in this index measured over a 12-month period rose from 14 per cent in August to 14½ per cent in September. The six-monthly change was 9¼ per cent in September compared with 9 per cent in August. The index for manufactured products other than food, drink and tobacco also rose by 1 per cent between August and September to 178.5, as a result of increases spread across most sectors. This index rose 5 per cent over the latest three months.

Among the individual sector indices which are published in table 2 the largest monthly increase was in the instrument engineering industries (3 per cent) whilst the smallest increases of ½ per cent occurred in the textiles, made-up clothing and timber industries. Slightly more than half of the 3 per cent increase in the index for the instrument engineering industries was accounted for by higher prices for spectacles, etc. In the latest three months this index rose by 5 per cent.

The most significant contributions to the 2 per cent increase in the index for the bricks, cement, etc, industries were accounted for by higher prices for precast concrete goods and asbestos cement goods. This index has shown the largest increase (8¾ per cent) in manufacturing over the latest three months.

Higher prices for fibreboard packing cases made the most significant contribution to the 1¾ per cent increase in the index for the paper industries.

Almost half of the 1½ per cent increase in the index for the pottery and glass industries was

Table 1 **Price index numbers of materials and fuel purchased**

1975 = 100

1968 SIC Orders or MLH numbers		1978 3rd qtr	1978 4th qtr	1979 1st qtr	1979 2nd qtr	1979 3rd qtr p	1978 Sep	1979 Feb	1979 Mar	1979 Apr	1979 May	1979 Jun	1979 Jul	1979 Aug p	1979 Sep p
Orders III to XIX	Materials and fuel purchased by manufacturing industry:	144.9	147.1	152.2	161.3	167.2	144.8	152.2	153.5	158.4	161.0	164.6	165.4	166.7	169.4
	Materials [1]	143.8	146.2	151.7	160.7	166.1	143.7	151.8	152.9	157.7	160.3	164.2	164.5	165.6	168.1
	Coal (except for carbonising), gas and electricity	152.8	153.0	154.1	164.5	174.3	152.8	153.0	156.2	162.2	164.9	166.3	171.2	174.1	177.6
Orders IV to XIX	Materials and fuel purchased by manufacturing industry, other than food, drink and tobacco manufacturing industries	139.2	140.9	146.6	158.7	166.1	139.1	146.9	148.4	155.3	158.3	162.4	163.6	165.6	169.1
	Materials [1]	136.6	138.6	145.1	157.5	164.4	136.4	145.7	146.8	153.9	157.0	161.5	162.0	163.9	167.4
Order III	Materials and fuel purchased by the food, drink and tobacco manufacturing industries	156.4	159.1	163.0	167.4	171.3	156.3	162.6	163.7	165.1	167.2	169.8	170.7	170.9	172.2
	Materials and fuel purchased by selected broad sectors of industry														
211 to 229	Food manufacturing industries	157.2	160.8	164.2	168.1	172.4	157.6	163.7	164.6	165.8	167.6	171.0	171.9	171.7	173.5
	Materials	157.3	161.0	164.5	168.0	171.6	157.7	163.9	164.8	165.7	167.5	170.7	171.2	170.9	172.7
	Fuel [2]	155.9	156.0	158.4	171.6	191.1	155.9	158.4	160.7	166.2	170.6	178.1	189.1	190.9	193.3
211 to 229 (excluding MLH 219)	Food manufacturing industries (excluding animal and poultry foods)	157.5	161.1	164.0	168.1	173.6	158.3	163.5	164.1	165.4	167.2	171.6	173.0	172.9	174.8
Order V	Chemicals and allied industries	153.2	155.3	161.3	171.9	185.5	153.6	162.0	164.0	167.2	171.6	177.0	183.3	184.7	188.4
311 and 312	Steel industries	146.7	148.8	153.2	160.6	168.7	147.6	152.4	156.5	158.4	160.6	162.8	167.7 p	168.4	170.0
321 to 323	Non-ferrous metals industry	146.7	155.6	171.4	178.2	173.5	150.2	173.7	179.1	179.4	177.8	177.5	168.9	172.5	179.2
Order VII (excluding MLH 342)	Mechanical engineering industries	155.8	159.3	162.9	168.7	173.7	157.1	163.2	164.4	167.6	168.7	169.7	172.1	173.6	175.3
Order IX	Electrical engineering industries	151.2	155.2	163.5	171.2	174.6	152.6	164.0	167.3	170.7	171.2	171.7	172.2	174.4	177.2
Order X	Shipbuilding and marine engineering industries	151.3	154.5	158.7	163.8	168.9	152.2	158.8	160.0	162.4	163.9	165.2	167.3	168.7	170.8
Order XII	Metal goods industries	155.5	159.1	163.9	170.6	176.7	156.7	164.3	166.0	168.7	170.9	172.2	174.6	175.6	180.0
Order XIII	Textile industries	146.1	149.6	154.3	162.4	167.1	146.7	154.2	156.6	160.4	163.0	163.8	166.3	167.0	168.1
Order XV	Clothing and footwear industries	144.9	148.4	154.0	162.3 p	168.1	145.9	153.0	156.5	160.0 p	162.8 p	164.1 p	166.9 p	168.2	169.3
461, 464 and 469	Bricks, cement etc, industries	154.5	157.2	163.1	173.3	185.4	154.8	163.0	166.0	169.9	173.9	176.1	182.6	185.7	187.8
462 and 463	Pottery and glass industries	160.2	163.3	167.2	177.5	188.4	160.6	167.4	168.9	173.8	177.5	181.1	186.0	188.1	191.2
Order XVII	Timber industries	150.7	153.4	159.0	167.5	173.7	151.8	158.6	162.2	165.8	167.5	169.2	172.0	174.0	175.2
481 to 484	Paper industries	120.2	124.8	129.6	135.6	137.4	119.8	129.6	130.3	134.4	136.3	136.1	135.9	137.3	139.1
Order XX	Construction materials	159.7	162.9	168.7	177.2	187.2	160.6	168.4	171.3	174.2	177.4	180.1	183.3	187.8	190.4
Part of Order XX	House building materials	159.8	163.0	168.6	177.0	187.8	160.9	168.4	170.9	173.9	177.1	180.1	183.5	188.5	191.3

[1] Includes crude oil and coal for carbonising [2] Includes petroleum products. p Provisional.

Table 1a **Price index numbers of materials and fuel purchased by selected sectors of industry**

1975 = 100

1968 SIC		1978 3rd qtr	1978 4th qtr	1979 1st qtr	1979 2nd qtr	1979 3rd qtr p	1978 Sep	1979 Feb	1979 Mar	1979 Apr	1979 May	1979 Jun	1979 Jul	1979 Aug p	1979 Sep p
361	Electrical machinery industry	152.5	155.6	161.8	167.8	173.0	153.7	162.0	164.0	166.9	167.9	168.6	171.2	172.7	175.0
362	Insulated wires and cables industry	145.3	149.7	164.2	173.0	169.5	146.7	164.9	171.5	176.1	172.8	170.0	165.5	169.5	173.6
364	Radio and electronic components industry	151.5	155.3	161.4	169.9	175.5	153.0	161.8	164.0	167.6	170.2	172.0	172.8	174.9	178.8
368	Domestic appliances industry	155.4	158.6	162.8	169.4	176.5	156.6	162.9	164.5	167.5	169.4	171.2	174.3	176.5	178.7
369	Electrical goods industries n.e.s.	153.0	157.3	163.7	171.4	176.0	154.6	164.0	166.4	169.8	171.5	173.0	173.7	175.8	178.6
381	Motor vehicle industry	156.1	159.1	163.1	168.9	175.4	157.2	163.5	164.8	167.7	168.7	170.3	173.6	175.3	177.3
411	Man-made fibres industry	137.4	140.8	146.5	160.0	167.0	137.8	146.1	149.1	157.5	160.6	161.8	164.9	166.7	169.5
414	Woollen and worsted industry	154.3	158.0	165.9	164.3	161.6	153.6	166.3	167.6	166.6	165.2	161.0	162.6	162.0	160.1
422/1	Household textiles and handkerchiefs industry	146.5	149.6	153.3	159.9	165.2	147.4	153.0	155.0	158.0	160.4	161.3	164.0	165.3	166.3
450	Footwear industry	142.2	148.9	158.2	173.7 p	183.0 e	148.4	156.2	163.2	169.1 p	174.4 p	177.7 p	180.4 e	183.1 e	185.4 e
481	Paper and board making industry	118.0	123.1	127.3	132.0	134.0	117.6	127.4	127.5	130.7	132.6	132.6	132.7	133.8	135.6

p Provisional e Estimates which are subject to possible major revision

Higher prices for spectacles.

accounted for by higher prices for vitreous china sanitary ware and pottery tiles.
Higher prices for steel generally were responsible for the 1 per cent increase in the index for the steel industries and also almost three-quarters of the 1 per cent increase in the index for the metal manufacturing industries.
The most significant contributions to the ¾ per cent increase in the index for the vehicles industry were accounted for by higher prices for passenger cars and commercial and public service vehicles. This index has shown the lowest increase (1¾ per cent) in manufacturing over the latest three months.
Almost half of the ¾ per cent increase in the index for the clothing and footwear industries was accounted for by higher prices for footwear.
The index for the food manufacturing industries increased by ½ per cent between August and September to 182.6. Higher prices for milk products made the most significant contribution. This index increased by 2¼ per cent over the latest three months.

Input prices

The price index for materials and fuel purchased by manufacturing industry increased by 1½ per cent between August and September to 169.4 (1975 = 100). The change in this index measured over a 12-month period rose from 15½ per cent in August to 17 per cent in September. The increase in this index over the latest six months rose from 9½ per cent in August to 10¼ per cent in September.
The 2 per cent increase between August and September in the index for coal, gas and electricity was again due to higher prices for electricity. This index now stands at 177.6
Higher prices for crude oil, primarily the result of a depreciation of sterling against the dollar, again made the most significant contribution to the 2¼ per cent increase between August and

continued on page 121

Notes on wholesale price indices

1 Detailed notes on index numbers of wholesale prices were last shown in *Trade and Industry*, 27 April 1979.

2 The index numbers are constructed on a net sector basis. This is to say, the price movements used to compile the index for a particular sector of industry are only those relating to transactions between the sector and other sectors. Transactions between undertakings in the same sector are exluded. Thus index numbers for the whole of manufacturing industry are not weighted averages of sector index numbers.

3 All the index numbers are compiled exclusive of value added tax and (before its abolition) of purchase tax. Revenue duties (on cigarettes and manufactured tobacco, alcoholic liquor, matches and mechanical lighters) are included. The duty on hydrocarbon oils is excluded from output price series that cover these products (unless specifically noted to the contrary) but is included in series for materials and fuel purchased by sectors of industry.

4 Indices for the latest two months are always provisional at all levels of aggregation because of the degree of imputation present for items for which the latest prices are not available. In the main the degree of imputation for earlier months has reduced sufficiently to allow the indices to be declared firm. Where imputation remains high however, provisional indices are published for periods longer than two months.

5 Even firm indices can contain some imputation and occasionally information is received which could produce a change in the value of an index which has already been published as firm. Only if the change is significant will it be made. Where such a change is made for an index which is no longer appearing in the table the revised index or indices are shown in a supplementary table immediately after the table in question.

6 The monthly indices relate to the average prices for the month. Where a price change occurs on any day other than the first of the month the full effect of the price change will only be reflected in the index for the following month.

7 Where extension of indices on base 1970 = 100 is required for contract purposes the multiplication factors and explanatory notes are shown in *Trade and Industry*, 15 December 1978.

Table 2 **Price index numbers of output (home sales)**

1975 = 100

1968 SIC Orders or MLH numbers		1978		1979			1978	1979							
		3rd qtr	4th qtr	1st qtr	2nd qtr	3rd qtr p	Sep	Feb	Mar	Apr	May	Jun	Jul	Aug p	Sep p
Orders III to XIX	Output of manufactured products	154.8	157.3	161.6	168.0	176.4	155.7	161.7	163.2	165.5	167.7	170.9	174.8	176.3	178.2
Orders IV to XIX	Products of manufacturing industries other than food, drink and tobacco manufacturing industries	152.3	155.2	160.0	167.3	176.6	153.3	160.1	161.9	164.6	167.1	170.1	174.8	176.6	178.5
	Output of selected broad sectors of industry														
211 to 229	Food manufacturing industries	163.7	165.7	169.8	175.0	181.6	164.4	170.0	170.5	172.1	174.2	178.6	180.5	181.6	182.6
211 to 229 (excluding MLH 219)	Food manufacturing industries (excluding animal and poultry foods)	165.3	167.7	171.3	176.3	183.6	166.2	171.4	171.9	173.2	175.5	180.3	182.2	183.6	184.9
Order V	Chemicals and allied industries	144.2	146.7	152.1	162.4	170.3	144.9	151.9	154.5	160.5	162.5	164.2	168.0	170.4	172.6
Order VI	Metal manufacturing	156.6	160.4	166.2	173.8	177.4	157.8	166.2	169.3	172.7	173.8	174.9	176.5	176.9	178.8
311 and 312	Steel industries	156.6	158.7	160.8	165.4	171.5	157.4	160.9	161.8	165.1	165.5	165.7	170.5	171.1	172.9
Orders VII to XII	Engineering and allied industries	154.8	158.4	163.4	168.2	173.8	156.0	163.4	164.5	166.6	168.2	169.9	172.0 p	173.8	175.7
Order VII (excluding MLH 342)	Mechanical engineering	154.4	158.2	163.6	168.2	173.7	155.9	163.7	164.6	167.3	168.3	168.9	171.8 p	173.6	175.8
Order VIII	Instrument engineering	149.4	152.7	158.6	161.1	166.6	149.9	159.2	159.4	160.6	160.7	162.0	164.5	165.2	170.2
Order IX	Electrical engineering	145.2	148.7	152.4	156.8	162.6	146.1	152.1	153.8	155.6	156.8	157.9	160.7 p	162.6	164.6
Order XI (excluding MLH 383)	Vehicles	165.5	168.6	174.0	179.2	184.6	165.9	174.1	174.6	175.7	179.1	182.7	183.5	184.5	185.8
Order XII	Metal goods industries n.e.s.	159.9	164.2	169.6	175.6	181.5	162.6	169.7	171.7	174.6	175.3	176.9	178.8	182.2	183.5
Order XIII	Textile industries	148.9	151.3	155.8	160.5	165.9	150.4	155.8	157.3	159.0	160.5	162.0	165.0	165.8	166.8
Order XV	Clothing and footwear	144.3	147.9	152.2	156.3	161.6	145.8	152.2	152.8	154.3	156.8	157.8	160.4	161.7	162.8
441 to 445 and 449	Made-up clothing	142.9	146.6	150.4	153.9	159.0	144.5	150.5	151.0	152.4	154.2	155.0	157.7	159.3	160.0
461, 464 and 469	Bricks, cement etc. industries	170.3	173.3	179.3	186.9	200.3	171.2	179.2	181.6	184.4	186.9	189.3	193.6	201.7	205.7
462 and 463	Pottery and glass industries	158.3	163.7	166.0	168.6	176.1	159.5	166.4	166.6	166.9	168.2	170.6	173.4	176.2	178.7
Order XVII	Timber industries	148.9	151.3	156.9	162.0	169.3	150.1	157.2	158.7	160.4	161.6	164.0	167.4	169.9	170.7
481 to 484	Paper industries	134.5	138.2	142.0	149.2	154.7	134.7	141.6	143.2	146.7	149.5	151.3	152.9	154.2	156.9

p Provisonal

Table 3 Commodities produced in the United Kingdom (home sales)

1975 = 100

1968 SIC order or MLH and industry	1978 Sep	1979 Jun	Jul	Aug p	Sep p
II Mining and quarrying					
101 **Coal**	152.0	168.6	183.6	183.7	183.7
102 **Stone and slate quarrying and mining**	172.9	201.0	204.7	211.0	211.6
Stone quarrying and mining					
Limestone and dolomite	181.1	212.3	216.4	222.0	222.9
Uncoated limestone roadstone and aggregates	168.0	194.9	198.0	203.1	204.0
Coated limestone roadstone	174.2	202.9	207.6	219.4	220.2
Granite	157.4	179.7	182.0	189.8	189.9
Granite and other chippings, aggregates and roadstone	153.7	180.3	178.4	183.6	183.6
Granite and other chippings	154.2	181.8	178.0	182.3	182.9
Coated granite and whinstone roadstone	159.8	179.3	184.3	193.8	194.1
Slate quarrying and mining					
Roofing slates	204.4	241.8	259.0	259.0	259.0
103 **Chalk, clay, sand and gravel extraction**	176.0	200.1	211.8	213.9	216.5
Sand and gravel (uncoated)	206.0	235.7	246.8	250.5	254.5
Sand and gravel ex-pit or works)	206.7	239.0	249.3	253.0	257.2
Sand and gravel (delivered)	181.7	207.6	219.4	221.9	223.1
Clay, brick, earth, marl and shale					
China clay	141.4	159.1	171.4	171.8	172.7
109 **Other mining and quarrying**	182.4	191.3	196.9	202.7	203.1
109/3 **Salt**	198.9	215.1	218.4	226.7	226.7
III Food, drink and tobacco					
231 **Brewing and malting**	149.3	160.4	160.4	160.4	160.4
240 **Tobacco**	161.2	164.6	168.5	168.5	173.5
IV Coal and petroleum products					
261 **Coke ovens and manufactured fuel**					
Foundry coke	152.5	166.1	166.1	166.1	166.1
262 **Mineral oil refining**					
Motor spirit (including duty) [1]	130.9	157.5	176.1	177.2	177.2
Gas/diesel oil (including duty) [1]	166.0	203.7	229.0	230.6	230.6
Gas oil fuel (including duty) [1]	168.6	209.4	236.8	238.5	238.5
Derv (including duty) [1]	160.3	189.6	209.9	211.0	211.0
Medium fuel oil (950 seconds including duty) [1]	169.5	200.2	220.9	222.0	222.0
263 **Lubricating oils and greases**	136.8	167.9	174.0	177.5	178.8
V Chemicals and allied industries					
271 **General chemicals**	146.3	178.4	184.6	185.8	187.7
271/1 **Inorganic chemicals**	155.1	170.1	172.6	173.3	177.4
Inorganic acids and oxygen compounds of non-metals	135.0	143.2	146.1	148.3	148.3
Sulphuric acid and oleum	144.5	162.2	164.4	171.3	171.3
Metallic oxides, hydroxides, peroxides and other inorganic bases	155.6	177.8	178.5	175.4	175.3
Metallic salts and peroxy salts of inorganic acids	155.7	173.4	174.9	177.4	184.9
Soda ash	170.3	188.9	188.9	198.1	203.2
Metallic salts and peroxy salts of inorganic acids-other than soda ash	151.8	169.3	171.1	171.9	180.0
271/2 **Organic chemicals**	140.0	187.3	196.0	197.3	198.1
Hydrocarbons other than products of coal tar etc	130.9	209.3	225.2	224.5	226.7
Halogenated, sulphonated, nitrated or nitrosated derivatives of hydrocarbons	154.1	184.1	186.8	191.8	194.6
Alcohols, phenols and pheno-alcohols	131.5	181.4	187.9	192.2	192.2
Nitrogen function compounds	139.2	158.4	160.0	160.0	160.0
271/3 **Other chemicals**					
Bleaching materials	182.9	206.1	212.0	217.3	217.3
Plasticisers, mixed or unmixed	128.9	179.4	184.2	185.6	187.7 e
272 **Pharmaceutical chemicals and preparations**					
Pharamaceutical chemicals —central nervous system	171.6	186.7	190.5	190.5	193.5
Pharmaceutical preparations	155.3	167.8	169.5 p	172.5	173.6
—central nervous system	175.8	191.1	193.8	195.4	196.6
Anaesthetics	144.8	146.0	147.9	148.0	148.0
Analgesics	166.9	188.2	192.8	196.0	197.8
Psycho analeptics	182.3	182.3	182.3	182.3	183.7
—cardiovascular system	172.5	181.6	181.8 p	184.1	186.0
Plain hypotensives	170.7	171.2	171.2 p	171.2	173.1
—respiratory system	178.8	188.7	189.7	194.6	194.7
Cough and cold preparations	179.0	196.9	199.1	210.3	210.7
—alimentary tract and nutrition	151.8	160.1	164.5	173.1	174.0 e
—dermatologicals	151.9	155.0	161.8 p	161.8	162.5
—general anti-infectives					
Antibiotics	127.2	132.3	132.3	132.3	133.5
Penicillins	151.0	163.5	163.5	163.5	165.3
273 **Toilet preparations**	149.8	161.5	166.1	171.9	174.7
—specifically for men	149.3	159.8	167.3	172.3	173.8
After-shave, cologne and pre-shave lotions in alcoholic lotion form	166.5	178.8	184.3	184.4	185.7
—other than specifically for men	149.9	161.7	166.0	171.9	174.8
Talc and dusting powders and bath preparations					
Talc and dusting powders	158.6	171.0	178.3	182.0	182.0
Bath oils, cream and liquid essences	138.3	159.9	161.1	161.1	161.1
Make-up preparations	148.5	158.0	164.2	164.7	164.8
Lipsticks and lip glosses inc. lipsalve	148.1	155.4	158.9	160.9	160.9
Face powders	152.2	165.5	175.4	175.4	175.4
Liquid and cream facial make-up preparations	157.0	167.3	171.2	171.2	171.2
Eye shadow and mascara	153.2	162.0	169.6	169.6	169.6
Nail preparations	131.1	140.6	146.8	146.9	146.9
Creams and lotions	138.1	149.9	152.2	153.9	155.0
Facial beauty care preparations	136.9	145.5	148.5	149.4	149.4
Cleansing creams, cold creams, lotions and milks, moisturisers, nourishing and night creams	134.1	143.5	147.2	147.4	147.4
General creams and lotions					
Hand creams, lotions and gels	163.1	176.3	179.3	185.7	191.4
Deodorants, anti-perspirants and depilatories	134.4	141.9	146.6	154.4	158.0
Dental toothpaste and powder	148.3	155.3	162.2	169.4	171.8
Soapless shampoos	160.4	175.1	184.2	200.8	207.1
274 **Paint**	142.0	158.2	163.0 p	166.9	168.3
Air drying and stoving finishers, undercoats, primers, surfacers and sealers, varnishes and lacquers					
Building structural and preservative products	141.3	156.5	161.1 p	165.2	165.2
Emulsion paints	138.6	152.8	157.1 p	161.3	161.3
Filling and sealing compounds of all types	134.5	153.6	154.0	154.3	155.5
275 **Soap and detergents**	137.5	149.8	155.2	155.7	155.5
Fatty acids	143.7	151.2	153.5	154.1	151.5
Soap (excluding scouring preparations)	133.9	141.1	146.8	147.1	147.1
Toilet soap in tablet form	130.9	137.3	142.3	142.7	142.7
Finished synthetic detergents compounded materials primarily for washing purposes	135.3	151.8	155.9	156.2	156.3
276 **Synthetic resins and plastics materials and synthetic rubber**	141.8	172.4	174.1 p	176.5	179.8
276/1 **Synthetic resins and plastics materials**	141.6	174.9	176.0 p	178.4	182.2
Products of condensation, polycondensation and polyaddition	142.0	170.5	171.2	174.2	176.7
Products of polymerisation and copolymerisation	138.4	181.2	182.6	185.0	189.6
Acrylics	129.0	145.8	148.7	149.4	151.4
Polyethylene granules, compounds and powders	134.6	184.3	185.4	192.6	192.7
Styrene polymers and copolymers	133.3	191.5	193.1	193.9	194.6
Cellulosics and other plastics and modified natural resins	134.4	147.2	149.3 p	151.7	154.2 e
Intermediate forms between the resin and semi-fabricated stages	147.7	182.4	182.4	190.1	191.6
Semi-finished products	147.1	170.4	170.9	171.1	175.4
Polyvinyl chlorides	156.3	192.0	192.0	192.5	203.9
277 **Dyestuffs and pigments**	157.8	180.6	181.2	180.9	183.6
Pigments	156.6	180.8	180.9	180.5	183.9
White lead [3]	168.1	273.3	245.5	233.1	234.1
278 **Fertilisers**	140.1	142.7	144.3	147.1	152.1
279 **Other chemical industries**	146.8	162.4	165.2 p	166.7	167.9
279/1 **Polishes**	156.5	181.9	183.9	188.0	191.1 e
Wax, refined, blended, bleached etc	156.2	233.0	229.0	235.4	237.8
279/3 **Explosives fireworks etc**	158.8	173.6	180.9 p	181.6	182.4
279/4 **Formulated pesticides**	147.8	157.2	160.2 p	161.3	162.3
Disinfectants	143.0	151.8	153.6	157.2	159.1
Pesticides	156.5	166.1	166.2	166.1	166.1
Insecticides (other than seed dressings)	158.5	167.1	167.2	167.0	167.0
Containing organophosphorous compounds	131.1	126.9	126.9	126.9	126.9
Preparations for plant control					
Herbicides	142.5	152.4	159.8 p	160.1	160.6
279/6 **Surgical bandages, etc**	147.5	165.2	166.5	167.8	170.4
Surgical and medicated dressings	151.7	173.6	173.9	175.2	177.1
Disposable sanitary goods					
Sanitary towels and tampons	143.7	157.6 r	159.7	161.1	164.4
279/7 **Photographic chemical materials**	146.0	152.3	154.9	156.0	158.2
VI Metal manufacture					
311/2 **Steel**	156.8	164.7	169.8	170.3	172.9
Non-alloy steels	156.1	162.5	166.8	167.2	169.6
Ingots, blooms, billets, slabs	165.0	180.4	180.4	181.5	188.7
Heavy rails, sleepers and fishplates, etc	148.6	160.1	160.1	160.1	160.1
Heavy rolled products, 80 mm and over	161.4	163.9	172.4	172.6	172.6
Angles, tees and other sections	156.9	160.7	160.7	160.9	160.9
Girders, beams, joists, columns	163.2	165.1	177.5	177.6	177.6
Rods and bars in coils	151.4	163.7	163.7	163.8	165.0
Steel strip (non-alloy)	158.1	161.6	165.4	168.2	168.2
Hot rolled strip (under 600 mm wide)	156.3	156.7	161.4	164.7	164.7
Plates in coils and cut lengths	137.7	138.2	138.9	139.0	139.0
Steel sheet (under 3 mm thick)	162.1	162.5	170.2	170.3	170.3
Uncoated steel sheet	167.6	168.1	175.0	175.2	175.2
Uncoated steel sheet hot rolled	152.0	152.4	158.6	158.7	158.7

Table 3 **Commodities produced in the United Kingdom (home sales)** *continued*

1975 = 100

1968 SIC order or MLH and industry	1978 Sep	1979 Jun	Jul	Aug p	Sep p
Uncoated steel sheet cold reduced	169.2	169.7	176.7	176.8	176.8
Electrical steel sheet	167.7	168.0	181.4	181.5	181.5
Galvanised steel sheet	147.7	148.1	154.6	154.6	154.6
Light sections	145.1	155.8r	155.8	157.1	159.8
Tinplate and blackplate	163.4	172.7	172.7	172.7	187.5
Tinplate	163.6	172.8	172.8	172.8	187.6
Blackplate	155.2	162.4	162.4	162.4	180.9
Bright steel bars, non-alloy	168.3	184.6	188.1	188.1	195.3
Forgings (other than drop forgings)	175.5	185.5	188.2	188.8	194.8
Non-alloy steel castings	162.1	183.6	184.8	184.8	184.8
Stainless and heat resisting alloy steels	151.8	160.5	166.3	166.3	166.3
Sheets (under 3 mm thick)					
Stainless steel sheets	166.9	175.0	185.5	185.6	185.6
Stainless steel castings	157.0	174.6	174.7	174.7	174.7
Alloy steels other than stainless and heat resisting	164.9	183.9	195.1	196.9	202.3
Ingots, blooms, billets, slabs (excluding tube)	172.5	198.7	214.9	218.9	225.3
Bars and rods other than in coil (excluding bright bars)	158.0	174.8	183.5	184.5	191.4
Plates in coils and cut lengths	138.4	138.6	173.8	173.8	173.8
Alloy steel castings	159.6	176.8	177.4	177.4	177.4
Structural steel	150.0	152.2	157.1	157.2	157.8
Steel for reinforcement (cut, bent, and delivered)	152.2	171.6	185.5	185.8	185.8
Light re-rolled bars and sections	148.3	159.7r	165.5	166.0	169.5
All types of steel forgings (other than drop forgings)	175.2	189.1	200.5	202.7	210.5
312 **Steel tubes**	164.9	169.7	171.5	171.6	171.6
Fittings for steel tubes	151.0	155.4	156.3	156.9	156.9
Steel tubes (other than electric conduit tubes)	171.9	174.2	176.3	176.4	176.4
313 **Iron castings and pig iron**	153.5	175.3	175.9p	177.3	177.8
313/3 313/4 **Iron castings**	154.0	176.3	177.0p	178.2	178.9
313/3 **Engineering castings**	151.5	170.2	171.6p	172.9	173.9
Vehicle iron castings	148.4	168.2	169.5p	170.9	171.0
Industrial and marine iron castings	154.1	171.8	173.3	174.5	176.3
Heavy engineering	154.1	170.3	170.3	174.8	181.5
Light engineering and hydraulic	154.9	168.5	170.6	171.3	172.2
313/4 **Other iron castings**					
Building and domestic goods	161.1	191.3	188.4	190.9	190.9
Cast and spun iron pipes and fittings	152.0	184.8	185.8	185.8	185.8
321 **Aluminium and aluminium alloys**					
Semi-manufactures (excluding castings and forgings)					
Aluminium plate, sheet, strip, circles and blanks	182.1	184.8	190.6	192.1	192.1
Aluminium extrusions and tubes (bars, rods, sections, etc)	177.0	189.5	193.5	193.9	193.9
Aluminium forgings	188.2	191.5	191.5	215.9	221.4
322 **Copper, brass and other copper alloy**					
Copper					
Copper tubes	148.4	190.4	185.0	181.0	185.4
Copper sheet and strip	140.6	167.2	159.7	169.0	171.5
Brass and other copper alloys					
—unwrought	130.2	155.9	149.5	150.3	152.8
—semi-manufactures	131.8	155.9	149.7	151.9	158.8
323 **Miscellaneous non-ferrous metals**					
Lead and lead alloys					
—semi-manufactures	175.1	302.2	277.6	263.5	268.3
Nickel [a]	112.2	173.4	148.1	142.6	145.3
Titanium	175.0	228.3	230.1	230.1	230.1

VII Mechanical engineering

331 **Agricultural machinery**	169.9	179.8	188.2	192.1	196.9
Soil preparation and cultivation machinery	167.2	174.3	177.3	178.0	187.2
Harvesting, threshing, feed processing etc, machinery	174.0	183.7	197.5	206.3	211.2
Pick-up balers	176.0	179.8	182.7	204.4	206.9e
Grinding mills and meal mixers (excluding combined mills and mixers)	164.0	179.4	180.0	188.1	188.1
Milking machinery					
Milking machines, including parts	170.6	191.1	197.0	197.0	198.4
Elevators and conveyors (excluding tractor mounted hydraulic loaders)	173.5	186.4	194.0	194.0	195.4
332 **Metal working machine tools**	160.0	177.6	179.9p	181.2	185.1
332/1 **Metal cutting machine tools**	161.6	180.3	183.2	183.7	188.5
332/2 **Metal forming machine tools**	156.2	172.4	173.5p	176.8	178.9
333 **Pumps, valves, compressors and fluid power equipment**	150.0	163.5p	164.2p	165.4	169.7
333/1 **Pumps**	154.1	166.5p	167.1p	169.1	172.7
Industrial pumps	154.4	166.6p	167.4p	169.4	173.1
Centrifugal pumps	154.4	164.5p	165.5p	167.6	172.0
Positive displacement pumps	154.4	173.6	173.6	175.6	176.8e
Kerbside petrol and oil measuring pumps and parts	149.2	163.2	163.2	163.2	165.0
333/2 **Industrial valves**	140.9	155.7	156.6p	157.0	161.1
Valves – ferrous metal	136.5	148.2	149.1p	149.7	154.6
Iron valves	151.9	165.8	165.8	168.6	172.8
Steel valves	131.3	142.4	143.6p	143.4	148.5
Valves – non-ferrous metal	153.4	177.1	177.9	177.9	179.8
333/3 **Air and gas compressors**	157.2	174.7	175.3	175.7	185.9e
333/4 **Fluid power equipment**	153.2	165.9	166.6	168.2	171.4
Oil/hydraulic fluid power equipment	155.4	170.1	171.2	171.6	176.6e
Pneumatic control fluid power equipment	149.3	158.3	158.3	162.1	162.1
334 **Industrial engines**	170.3	183.5	184.0p	184.2	190.4
Diesel compression internal combustion engines	170.6	184.4	184.9	185.0	191.4
336 **Construction and earth-moving equipment**	173.2	185.0	185.6	187.6	188.5
Excavators, trenchers, ditchers and digging machinery including parts	180.9	196.7	198.1	200.7	201.0
Wheeled tractor shovels, crawler tractors, dumpers and other earth-moving equipment	174.0	182.4	182.5	184.3	185.4
Dumpers and dump trucks	160.6	171.8	172.0	173.6	174.9
Concrete mixing and placing machinery	161.0	174.4	176.0	180.6	181.6
Crushing, pulverising and screening plant, including parts	160.7	172.9	172.9	175.5	177.1e
337 **Mechanical handling equipment**	157.3	169.6p	172.4p	176.2	176.9
337/2 **Cranes and transporters**	158.9	168.7	176.6	177.9	178.1
337/4 **Lifting and winding devices**	155.5	173.3	174.9p	175.9	176.8
337/5 **Powered industrial trucks and tractors**	165.0	175.8	176.2	186.6	186.9
339/1 **Mining machinery**	153.0	160.3p	161.3p	161.7	163.2e
339/3 **Refrigerating machinery**	165.0	181.1p	183.1p	184.3	185.6e
339/5 **Scales and weighing machinery (excluding precision balances)**	154.3	187.0	187.0	187.3	189.7e
339/6 **Portable power tools**	153.6	162.6	167.3p	172.1	172.6
Portable power tools, non-electric – pneumatic					
—for civil engineering, mining and quarrying	161.4	176.8	178.1	178.1	179.6
—for general engineering	165.5	178.9	179.1	180.5	180.5
Portable power tools, electric	147.3	153.5	160.8	167.7	168.2
—power drills	154.6	158.0	167.9p	176.5	176.5
Portable power driven saws [a]	146.0	149.8	156.6	163.9	163.9
339/7 **Food and drink processing machinery**	156.2	171.5	178.1p	182.8	183.0
339/9 **Miscellaneous (non-electrical) machinery**	161.3	174.2p	177.1p	179.0	182.3
349/2 **Precision chains**	161.5	170.2	173.5	182.1	184.9

VIII Instrument engineering

352 **Clocks, watches and time recorders**	157.4	165.4p	170.2p	170.2	175.8e
Clocks	163.7	170.9	174.3	174.3	180.3e
354 **Scientific and industrial instruments and systems**	147.2	159.5	161.7	161.9	164.4
354/2 **Other scientific and industrial instruments and systems (non-optical)**					
Analytical instruments	144.8	158.5	159.1	159.8	165.0
Spectrophotometers and absorptiometers	135.5	145.6p	145.6p	145.6	152.2
Electrical measuring, testing and controlling instruments and apparatus	142.0	151.8	154.8	154.8	156.2

IX Electrical engineering

365 **Broadcast receiving and sound reproducing equipment**	132.5	135.1p	138.2p	138.3	139.3
365/1 **Gramophone records and pre-recorded tapes**	158.0	162.1	177.3	177.3	177.3
Gramophone records	160.1	164.5	179.8	179.8	179.8
—33⅓ rpm	161.2	164.9	178.8	178.8	178.8
—45 rpm	155.4	162.7	184.4	184.4	184.4
Pre-recorded tapes (other than video)	147.8	150.3	165.5	165.5	165.5
365/2 **Broadcast receiving and sound reproducing equipment, other than gramophone records and pre-recorded tapes**	124.7	126.8p	126.2p	126.3	127.6
Domestic television receivers	127.6	130.0p	128.8p	128.8	130.0
—monochrome	126.9	133.9p	133.9p	133.9	133.9
—colour	127.6	129.7p	128.3p	128.3	129.6
Stereo audio systems, incorporating turntable/amplifier	112.2	113.8p	114.1p	114.6	116.5e
368 **Electrical appliances primarily for domestic use**	155.6	168.6	170.0	171.3	173.5
Domestic electric cooking apparatus	157.2	174.5	175.3	177.7	179.5
Domestic electric flat irons	148.2	165.5	166.7	169.6	169.6
Domestic electric heating apparatus	164.4	178.6	179.1	179.1	185.6
Domestic space heating apparatus	171.8	182.1	182.1	182.1	192.2
Electric water heaters	161.3	186.5	188.7	188.7	188.7
Vacuum cleaners	157.1	166.3	169.6	169.7	169.7
Domestic refrigerators and freezers	145.2	152.5	154.8	154.8	157.8e
Miscellaneous domestic electric appliances (includes food and drink mixers, hair dryers and dry shavers)	157.0	171.7	171.7	172.1	172.3
369/4 **Electric lamp bulbs and tubes**	155.4	165.1	169.4	169.4	172.1e
Fluorescent tubular lamps	155.4	169.3	176.4	176.4	179.4e
Electric lamp bulbs, filament type —exceeding 28 volts	157.4	168.7	175.2	175.2	177.6e
Primary and secondary batteries	164.3	193.8	201.2	201.2	202.2

Table 3 **Commodities produced in the United Kingdom (home sales)** *continued*

1975 = 100

1968 SIC order or MLH and industry	1978 Sep	1979 Jun	Jul	Aug p	Sep p
XI Vehicles					
380 **Wheeled tractors, complete**	184.0	199.5	204.1	204.2	204.2
381 **Motor vehicles**	166.2	183.4	184.0	184.9	186.3
Passenger cars	170.1	186.2	187.1	187.6	188.6
Passenger cars [3]	170.1	191.5	199.2	199.8	200.8
Commercial and public service vehicles	168.1	191.2	191.2	191.8	193.8
Commercial vehicles	169.4	190.4	190.4	190.7	191.5
Commercial vehicles and chassis not exceeding 3.5 tons gvw	176.4	199.8	199.8	200.3	201.3
Commercial vehicles and chassis exceeding 3.5 tons but not exceeding 16 tons gvw	167.0	187.3	187.5	187.9	188.9
Commercial vehicles and chassis exceeding 16 tons gvw	163.8	181.9	181.9	181.9	181.9
Public service vehicles	165.3	192.5	192.5	193.5	198.3
XII Metal goods not elsewhere specified					
390 **Engineers small tools and gauges**	177.1	192.8	197.9 p	206.0	207.2
Engineers cutting tools	176.4	192.4	196.2 p	203.7	204.7
Hard metal tipped tools	186.7	206.0	206.0	219.6	219.6
Diamond tipped tools and diamond dies	193.1	238.7	239.3	240.0	240.5
Saws					
Hacksaw blades	200.3	222.6	227.1	240.2	240.2
Milling cutters	153.8	168.3	168.3 p	168.3	172.2
Lathe and planer tools	204.0	231.2	235.9	248.1	248.1
Engineers gauges and measuring instruments	173.0	192.5	198.5	201.1	202.3
Mechanical measuring instruments (micrometers, dial gauges, vernier gauges etc)[4]	174.2	191.5	197.0	203.9	205.2
391 **Hand tools and implements**	169.1	178.8	187.4	194.4	195.6
Agricultural, horticultural and foresters hand tools	181.2	188.2	202.2	202.2	203.7
Hand saws and hand saw blades	194.4	211.1	226.7	229.7	229.7
Hand tools and implements excluding agricultural and foresters hand tools and saws and saw blades	166.6	176.4	182.1	192.0	193.3
Pliers, pincers and nippers, etc	190.5	206.2	215.6	224.6	224.6
Spanners and wrenches	169.0	186.0	194.2	198.3	198.3
Planes, hammers, cold chisels etc, screwdrivers, wood chisels and gouges	170.9	176.1	179.6	194.7	198.2
Measuring and marking out tools	148.9	164.1	179.6	183.6	183.6
392 **Cutlery, spoons, forks and plated tableware etc**	159.9	175.0	177.0	179.7	180.8
Finished cutlery suitable for domestic or personal use	156.1	171.1	177.8	180.7	182.7
Scissors and tailors' shears (including pinking shears)	157.5	171.8	195.9	196.9	198.1
Finished spoons and forks of all kinds (incl. fisheaters, butter knives and ladles)					
of stainless steel	167.5	178.2	178.2	184.3	185.4
393 **Bolts, nuts, screws, rivets etc**	170.9	181.3	182.6	184.5	186.0
Precision standard bolts etc, of high tensile steel	150.1	153.6	153.8	154.4	156.2
394 **Wire and wire manufactures**	153.4	174.4	174.8	176.9	178.1
Iron and steel wire	155.6	175.0	177.0	177.7	178.0
Single drawn wire					
—of high carbon steel [5]	157.1	171.8	171.8	171.8	171.8
—other than alloy and high carbon steel	157.0	173.8	173.8	173.8	173.8
Wire ropes (excluding insulated electric wire and cable)	150.8	161.2	166.2	168.0	168.0
Iron and steel woven wire, cloth gauze fabric etc, (excluding netting and fencing) of square or rectangular mesh	160.0	173.3	174.9	187.2	187.8
—stainless steel	151.3	162.6	165.1	176.1	177.0
—other than stainless steel	164.5	178.9	180.0	193.0	193.3
Other wire manufactures, ie grille netting, fencing reinforcement fabric etc	153.2	170.4	176.2	176.3	178.0
Wire of copper, brass and other copper alloys					
Woven wire cloth, gauze fabric, etc, of copper and brass, etc	151.4	175.6	176.0	188.3	190.0
Reinforcement fabrics	150.3	162.2	174.0	174.2	175.9
Chain link fencing	160.8	186.0	186.0	186.0	187.7
399 **Metal industries not elsewhere specified**	160.5	174.2	176.0 p	179.0	180.5
399/1 **Metal furniture**	156.6	171.9	174.5	178.8	180.0
Office metal furniture	165.0	180.8	183.2	183.5	185.0
Filing cabinets and other filing containers	170.7	186.6	186.6	187.0	190.6
399/2 **Metal windows and door frames**	170.6	190.3	191.0	195.3	197.2
399/6 **Domestic hollow ware**	163.5	174.4	180.4	181.6	182.2
Cookware	168.4	181.6	189.7	190.3	190.5
399/7 **Vats, tanks, cisterns and other industrial hollow ware**	161.8	173.1	175.6 p	177.4	177.4
Steel drums	165.6	173.2	176.0 p	178.0	178.0
399/8 **Needles, pins, fishhooks and other metal smallwares**	177.2	191.2	193.8	196.0	197.8
399/9 **Domestic gas appliances**	165.4	174.1	179.9	181.9	181.9
Gas cookers	164.8	173.4	177.7	180.7	180.7
Gas fires and space heaters	164.9	176.2	182.3	183.0	183.0
Water heaters and other domestic gas apparatus (excl. refrigerators and meters)	168.7	173.1	184.7	184.9	184.9
399/12 **Miscellaneous metal goods**					
Sanitary ware and plumbing fixtures and fittings	159.4	185.6	186.2	186.9	186.9
Fire extinguishers (hand operated chemical type only)	145.5	155.7	165.5	165.5	165.5
Catering equipment	162.6	178.0	179.0	179.2	183.2
Plumbers brassware	157.4	186.5	187.4	187.4	187.4
XIII Textiles					
411 **Man-made fibres production**	128.8	138.5	141.5	141.8	142.7
Man-made fibres – continuous filament yarn	138.8	154.1	155.3	155.7	157.1
412 **Spinning and doubling on the cotton and flax systems**					
Single yarns spun on the cotton and flax systems	146.8	160.0	161.6	163.4	163.4
Single yarns of man-made staple fibres spun on the cotton and flax systems	143.1	154.6	155.0	158.3	159.0
Finished thread for sewing, embroidery, etc	174.3	181.5	195.8	201.5	202.2
—of man-made fibres	143.9	152.2	164.2	168.3	169.6
413 **Weaving of cotton, linen and man-made fibres**	138.5	152.2	155.4	156.2	157.0
Woven cotton cloth in the loomstate	145.2	158.1	161.5	163.6	163.6
Cloth wholly of man-made continuous filament yarn in the loomstate	133.5	153.4	156.2	157.3	158.0
Woven linen	172.1	183.3	187.0	189.0	190.6
Woven fabric of glass fibre	164.5	173.6	180.6	180.6	183.0
414 **Woollen and worsted products**	156.7	168.9	169.6	170.2	171.6
414/1 **Wool sorting, cleaning, etc and combing and top making**					
Wool tops [6]	162.6	167.5	161.3	161.1	163.0 e
414/2 **Yarns spun on the worsted and semi-worsted systems**	150.1	162.4	163.9	165.6	167.0
Yarns of wool spun on the worsted system	154.9	164.0	165.8	167.2	169.8
Yarns of man-made fibres spun on the worsted system	137.4	148.1	149.5	151.9	152.8
414/3 **Woven worsted fabrics**	149.3	158.2	158.8	158.7	158.7
414/4 **Wool rag** [3]	161.4	188.1	187.9	189.3	191.0 e
414/5 **Woollen spinning and weaving**					
Woven woollen fabrics (other than blankets)	162.5	178.4	178.8	179.8	180.4
Woven woollen fabrics (other than blankets) containing 50 per cent or more by weight of wool or fine animal hair	166.5	179.6	180.1	181.3	182.2
Spinning and weaving of jute and other yarns on the jute system	139.4	161.6	162.8	163.1	163.2
Spun yarns of jute and man-made fibres	144.2	164.8	168.6	169.2	169.3
Woven cloths of jute and man-made fibres	131.9	146.8	146.8	146.8	146.8
Woven cloths of polypropylene on the jute system	139.4	165.2	165.2	165.5	165.7
Rope, twine and net	126.8	138.9	140.1	142.2	142.3
Cordage, cables, ropes and twine of textile materials (excl. agricultural twines)	127.0	139.7	141.8	145.4	145.4
417 **Hosiery and other knitted goods**	136.8	150.6	154.3	154.9	156.1
Socks and stockings	128.2	143.9	145.7	146.1	147.8
Women's socks and stockings					
418 **Lace**					
Finished lace and lace net (other than made up articles) – Raschel and other warp knitting machine products	215.0	231.3	233.2	233.8	233.8
419 **Carpets and rugs**	154.1	166.7	169.9	170.5	172.6
Woven carpets and carpet type rugs	167.8	185.3	189.4	189.8	191.5
—faced with yarn containing at least 50 per cent but less than 100 per cent by weight of wool	170.4	187.3	192.0	192.8	195.7
Rugs including pile fabric, deep pile knitted	159.1	168.7	168.7	176.5	183.8
421 **Narrow fabrics**					
Petersham, galloons and ribbons	157.4	176.9	178.9	180.8	180.9
422 **Made-up textiles**					
422/1 **Household textiles and handkerchiefs**	144.3	158.4	162.1	162.2	162.9
Hand and bath towels	156.9	173.9	173.9	173.9	173.9
429 **Other textile industries**	167.1	181.2	185.4	189.4	191.9
429/1 **Asbestos manufactures**	173.3	187.0	192.7	198.8	202.9
429/2 **Miscellaneous textile industries**					
Mechanically bonded fibre-needled fabrics	166.2	184.0	185.1	186.6	187.2
XIV Leather goods and fur					
431/1 **Leather**					
Finished leather – for footwear	137.9	204.0 p	210.0 e	214.0 e	217.0 e
432 **Leather goods**	152.0	172.6	176.1	176.5	177.2

Table 3 **Commodities produced in the United Kingdom (home sales)** *continued*

1975 = 100

1968 SIC order or MLH and industry	1978 Sep	1979 Jun	Jul	Aug p	Sep p
XV Clothing and footwear					
441 **Weatherproof outerwear**	142.1	151.2	153.5	154.0	155.7
Raincoats (excl. those of infants)					
Raincoats other than of plastics materials	136.6	145.5	149.2	149.6	150.1
Weather protective industrial clothing of PVC coated materials	154.2	178.4	178.4	178.4	184.2
442 **Men's and boys' tailored outerwear**	143.2	149.4	151.4	152.3	153.7
Men's and boys' suits	153.3	157.1	159.1	159.1	161.8
Men's trousers (sold separately)	130.4	140.4	141.8	142.3	142.3
444 **Overalls and men's shirts, underwear, etc**	149.2	158.5	161.9	162.5	164.0
444/2 **Men's and boys' shirts, underwear and nightwear**	140.0	149.7	154.9	155.1	157.2
449 **Corsets, gloves and miscellaneous dress industries**	151.6	162.5	165.8	168.8	168.9
449/1 Corsets	137.9	150.8	154.4	157.8	157.8
Brassieres	164.3	175.7	180.1	180.1	180.1
449/3 **Umbrellas and walking sticks**	142.0	149.8	149.8	156.8	157.2
450 **Footwear**	150.5	167.4	170.1	170.6	172.7
Outdoor footwear	151.5	169.2	172.2	172.6	174.0
Boots and shoes with uppers wholly or mainly of leather	159.8	181.3	185.5	186.0	187.6
Men's boots and shoes with uppers wholly or mainly of leather	160.4	179.8	186.9	187.8	190.9
Women's boots and shoes – with uppers wholly or mainly of leather	163.7	185.3	187.3	187.5	188.2
Slippers, houseshoes and ballet shoes					
Women's slippers, houseshoes and ballet shoes	148.2	163.2	163.2	163.2	165.0
XVI Bricks, pottery, glass, cement, etc					
461 **Bricks, fireclay and refractory goods**	168.3	184.4 p	190.8 p	195.6	199.2
461/1 **Refractory goods**	169.9	185.6 p	196.6 p	197.4	203.9 e
Refractory bricks and shapes	172.0	179.0 p	191.2 p	192.3	196.4 e
Firebricks and shapes	158.1	166.4 p	173.0 p	176.0	178.5 e
461/2 **Clay building bricks and other non-refractory goods**	166.2	182.9	186.1	194.0	195.0
Common, facing and engineering bricks	166.9	183.4	186.2	195.0	195.0
Common bricks	166.4	185.2	187.1	193.2	193.2
—Non-fletton (ex-works)	170.9	189.5	192.9	198.8	198.8
—Fletton (delivered)	160.7	179.9	179.9	186.4	186.4
Facing bricks	168.0	183.5	187.0	199.4	199.4
—Non-fletton (ex-works)	173.7	186.9	192.2	198.0	198.0
—Fletton (delivered)	157.4	177.2	177.2	202.1	202.1
Engineering bricks (ex-works)	163.1	175.4	177.9	179.7	179.7
Engineering bricks (delivered)	164.4	174.9	188.1	202.3	202.3
Clay roofing tiles – (ex-works)	159.0	176.5	177.5	186.3	186.3
Unglazed floor quarry tiles – (ex-works)	166.7	176.3	180.1	180.8	180.8
462 **Pottery**	156.2	171.7 p	174.0 p	177.2	182.7
462/1 **Electric ware incl. insulators and insulator fittings wholly or mainly of ceramic material**	154.7	169.5	170.8	172.3	175.6
462/2 **Vitreous china sanitary ware and pottery tiles**	156.1	169.2	170.0	170.0	182.5
Tiles, excl. pre-cast concrete tiles	145.2	157.1	158.4	158.4	162.7
Vitreous china sanitary ware	170.3	185.0	185.0	185.0	208.3
463 **Glass**	160.7	170.6	173.7 p	176.3	177.9 e
463/1 **Glass other than containers and vacuum ware**	160.9	168.8	174.1	176.5	178.3
Flat glass	165.0	167.8	180.5	180.9	180.9
Domestic and ornamental glassware	163.4	173.5	175.8	189.0	191.1
—Hand gathered	158.8	169.1	175.8	186.7	186.7
—Mechanically gathered	165.2	175.2	175.7	189.9	192.8
Laboratory hygienic and pharmaceutical glassware and balls, tubing and rods	156.6	170.3	170.9	176.2	179.9 e
Glazing sheet and plate glass	168.0	169.0	181.7	182.1	182.1
463/2 **Glass containers and vacuum ware**	160.4	172.7	173.3 p	176.1	177.4
Glass containers non-tubular for all products excl. wines, spirits, beer and cider	161.8	173.9	174.5	178.7	179.5
464 **Cement**	169.2	187.9	187.9	212.3	212.3
Calcareous cement (other than clinker) delivered in bulk	170.0	192.3	192.3	217.2	217.2
Cement in bags	165.0	179.7	179.7	179.7	183.0
469/1 **Abrasives**	164.2	181.5	181.6	181.6	184.6
Abrasive wheels, segment sharpening stones and other forms of bonded abrasives incl diamond)	166.5	176.2	176.2	176.2	180.1 e
Coated abrasives – abrasive paper and cloth	172.9	191.9	196.7	204.0	209.0 e
469/2 **Miscellaneous building materials and mineral products**	148.1	161.6	161.6	161.6	161.6
Plasterboards	166.7	181.2	185.4	192.9	196.2
Precast concrete goods	163.1	188.2	187.7	201.4	203.0 e
Concrete blocks, bricks, kerbs and edgings	152.3	177.4	177.4	191.6	192.2 e
Flagstones	168.9	193.0	200.8	212.2	218.6
Kerbs and edgings	175.9	177.6	181.8	181.8	182.7
Precast concrete building blocks – delivered					
Precast concrete pipes to BS556 – delivered					

1968 SIC order or MLH and industry	1978 Sep	1979 Jun	Jul	Aug p	Sep p
Roofing tiles and fittings and concrete/terrazzo floor and wall tiles	157.0	167.1	176.8	181.7	184.4 e
Asbestos cement goods	195.6	230.6	230.6	230.6	250.0 e
Bituminous and flax felts	153.5	185.5	188.3	193.0	196.5 e
Insulating materials for thermal and acoustic purposes n.e.s.	161.0	174.2	174.2	178.0	187.4
Quicklime	185.5	203.4	203.4	204.7	228.5
Limestone dressed, polished etc	196.2	212.8 p	218.9 p	224.5 e	228.6 e
Plaster (gypsum)	147.7	162.5	162.5	162.5	162.5
XVII Timber, furniture, etc					
471/1 **Timber, sawmilling etc**	168.9	192.2	196.5	204.1	210.0
Homegrown sawn hardwood	142.6	160.9	178.5	178.5	178.9
Hardwood flooring blocks and mosaic flooring	157.4	171.7	175.1	177.1	177.2
471/2 **Builders' woodwork**	157.3	170.6	176.4	178.0	178.1
Door sets, leaves and frames and window frames	156.7	171.4	179.8	182.8	182.8
Door leaves	157.5	169.6	171.8	172.2	172.4
Window frames	158.1	176.5	176.8	178.0	178.0
Timber structures and structural components	147.6	160.0	163.2	165.9	166.3
472 **Furniture and upholstery**	143.0	154.4	159.3	163.7	163.7
Domestic upholstered furniture	151.9	164.7	167.1	169.5	170.2
Domestic wooden furniture	147.6	156.8	159.3	161.0	162.2
Bedroom furniture, excl. built-in	153.5	175.3	176.4	179.4	179.4
Kitchen furniture (excl. built-in)	153.8	173.6	174.8	176.7	176.7
—other than tables and seating	153.7	165.6	167.1	170.0	170.7
Dining/living room furniture, excluding built-in	150.2	162.0	162.9	162.8	163.7
Seating	149.5	160.2	160.5	164.1	164.3
Occasional furniture for dining/living room	162.0	178.1	187.2	188.7	189.5
473 **Bedding and soft furnishings**	192.3	206.0	206.3	203.2	204.4
Fully finished mattresses					
Bolsters and pillows (covered)					
XVIII Paper, printing and publishing					
481 **Paper and board**	131.1	146.5	147.3	148.8	149.9
Printing and writing paper and all boards for printing (excl. newsprint)	130.3	151.3	152.7	153.0	153.0
Wrapping paper	121.3	137.4	138.0	138.0	142.9
All tissue stocks	128.3	134.0	134.0	134.0	137.3
Industrial and special purpose paper	127.3	139.7	141.6	141.6	141.6
Packaging boards	141.5	153.6	153.8	159.4	160.5
Industrial and special purpose boards	139.2	150.6	151.8	153.6	153.6
Packaging products of paper, board and associated materials	135.1	153.5	154.9	155.4	158.5
482/1 **Cardboard boxes, cartons and fibre-board packing cases**	139.1	156.6	158.3	158.8	162.3
Cartons	153.2	170.6	174.7	174.7	174.7
Fibre-board packing cases	126.1	144.8	144.8	144.8	150.0
—Solid	132.7	153.3	153.3	153.3	159.1
—Corrugated	125.6	144.2	144.2	144.2	149.3
482/2 **Miscellaneous packaging products of paper and film**	126.0	146.6	147.1	147.7	149.9
Paper bags	107.5	123.4	123.5	124.5	133.6
Paper sacks	125.7	150.2	151.2	151.2	151.2
483 **Manufactured stationery**	146.4	164.3	169.7	170.9	171.7
Commercial envelopes	133.5	157.3	157.3	159.6	159.6
Business forms	144.0	159.6	165.6	166.2	166.2
Continuous stationery	132.2	148.7	152.5	153.5	153.5
Stationery and scholastic books and ruled paper	156.5	186.4	186.4	187.8	196.5
Loose leaf supplies	153.2	158.4	171.0	171.8	171.8
Filing supplies	137.9	155.7	160.3	160.3	161.1
484 **Manufactures of paper and board not elsewhere specified**	137.7	150.4	150.5	153.9	159.4
484/2 **Miscellaneous manufactures of paper and board**	142.0	152.8	153.0	159.3	165.8
Toilet paper	137.9	151.2	151.2	155.8	161.3
Household and sanitary tissue products	139.5	151.7	151.7	158.4	162.9
Handkerchiefs and facial tissues	136.0	148.5	148.5	153.1	159.3
Kitchen rolls and towels					
XIX Other manufacturing industries					
491 **Rubber manufactures**	155.5	169.0	174.6	178.0	181.0
491/1 **Tyres and tubes**	152.1	163.8	163.8	167.9	172.5
New tyre covers					
—cross-ply, car and van	149.5	166.3	166.3	172.8	178.5
—radial ply, car and van	150.6	163.7	163.7	167.0	171.3
—commercial vehicles	151.7	164.3	164.3	168.4	172.9
—tractors, earthmovers and land/road	153.9	164.2	164.2	168.7	170.8
491/2 **Other rubber goods**	160.3	178.2	181.8	182.2	182.5
Belting (of rubber or plastics)	164.3	185.1	187.6	188.1	188.1
Conveyor and elevator belting	149.3	159.4	166.2	166.2	167.3
Belting other than conveyor and elevator belting	142.3	161.8	163.7	166.4	174.6
Transmission belting					
Miscellaneous rubber products					
Cellular products of rubber					

Table 3 **Commodities produced in the United Kingdom (home sales)** *continued*

1975 = 100

1968 SIC order or MLH and industry		1978 Sep	1979 Jun	Jul	Aug p	Sep p
492	**Linoleum, plastics floor-covering, leathercloth etc**	135.9	155.7	157.8	158.5	158.5
493	**Brushes and brooms**	150.5	168.5	170.7	173.4	173.9
	Decorating brushes and rollers	146.6	161.0	161.0	167.2	167.2
	Toilet brushes	157.2	177.1	177.9	177.9	180.2
494	**Toys, games, children's carriages and sports equipment**	150.8	169.8	172.7	173.9	174.6
494/1	**Toys and games**	146.9	168.0	170.7	171.5	172.0
	Dolls and soft toys	156.2	168.1	170.4	172.5	173.0
	Mechanically self-propelled and die-cast metal toys	146.4	173.8	177.4	177.4	177.4
	—mechanical (self-propelled) including train sets	141.6	165.1	165.9	165.9	165.9
	—die-cast	147.2	175.7	180.1	180.1	180.1
	Indoor table games	143.7	157.4	160.9	161.9	162.0
494/3	**Sports equipment**	164.5	177.9	182.5	182.5	184.6
495	**Miscellaneous stationers' goods**	143.1	151.1	152.3	154.2	155.4
495/1	**Pens and pencils**	154.0	162.8	166.3	170.2	171.8
	Ballpoint pens	154.7	163.0	165.9	168.9	170.7
	Fountain pens, stylos and markers	147.1	160.4	166.8	171.0	171.0
	Fountain pens with stainless steel nibs	150.9	171.3	171.3	178.0	178.0
496	**Plastics products**					
	Building materials of plastics	156.3	191.5	195.0	195.9	196.6
	Pipes and fittings of plastics	159.4	204.9	210.8	212.4	213.1
	Rainwater pipes and fittings of plastics	158.0	196.5	205.4	205.5	205.6
	Packaging products and transit containers of plastics	145.9	174.0	176.3	177.9	181.1
	Other plastics products					
	Haberdashery of plastics (including slide and zip fasteners)	150.6	160.8	160.7	160.7	160.7
499/1	**Musical instruments**					
	Pianos	155.8	163.5	170.3	172.4	174.6

Other indices

1968 SIC order or MLH and industry		1978 Sep	1979 Jun	Jul	Aug p	Sep p
312, 361/2, 362, 369/5	Part Electrical installation materials, domestic	150.3	174.1	177.7	183.9	185.9
338, 399/1, 399/3, 472	Part Office equipment and machinery (excluding computers and calculators)	151.4	161.3	164.5	165.5	167.0
399/1, 472	Part Office furniture	154.4	170.5	173.4	175.1	176.4

Special indices [4]

Granite and limestone roadstone	166.7	194.3	196.7	204.6	205.2
Petroleum products	152.3	186.5	209.0	209.0	211.0
Steel sheets	164.3	165.2	173.2	173.3	173.3
Steel sheet piling	163.0	180.1	180.2	180.4	180.4
Finished stainless steels	142.1	145.2	151.7	151.7	151.7
Finished steels (other than sheets tinplate, tubes, forgings and castings)	152.2	159.2	163.9	164.5	166.0
Steel castings	160.5	180.1	180.9	180.9	180.9
Semi-finished steels for forgings (other than drop forgings)	169.6	194.2	207.2	209.7	218.0
Malleable iron castings	157.4	180.4	180.6	180.5	180.8
Wrought aluminium	178.6	193.5	197.0	199.1	199.6
Brass ingots	127.3	146.5	140.7	141.5	144.3
Door sets, leaves and frames	157.0	171.5	180.4	183.1	183.1
Domestic furniture	149.0	161.5	164.6	167.6	168.1
Divan sets	154.3	168.3	172.9	175.8	175.8

[1] Index based on scheduled outer zone prices for minimum bulk loads of 500 gallons (motor spirit 1000 gallons) exclusive of rebate.
[2] Source of price information: trade publications.
[3] Inclusive of VAT and car tax.

These series are no longer publishable: Hair preparations (excl. shampoos).
Man-made continuous filament yarns, textured, bulked or crimped-synthetic fibres.
New tyre covers.

[4] These indices are specially constructed outside the normal wholesale price index structure. Their continued publication is a temporary measure to enable extant VOP contracts to be completed.
[5] This series is published this month for the first time.
p Provisional e Estimates which are subject to possible major revision r Revised

Revision to table 3

1968 SIC		1979 Mar	Apr	May
279/6	Sanitary towels and tampons	150.0	151.0	153.9
311/2	Light sections			155.6
	Light re-rolled bars and sections			159.6

Addendum to table 3. Confirmation of figures previously published as provisional

SIC		1978 Aug	Sep	Oct	Nov	Dec	1979 Apr	May
339/1	Mining machinery	152.9	153.0	154.3	154.6	155.0		
464	**Cement**							
	Calcareous cement (other than clinker) delivered in bulk						187.9	187.9
	Cement in bags						192.3	192.3

continued from page 116

Electricity puts up materials indices.

September in the index for materials purchased by manufacturing industry other than the food, drink and tobacco industries. Prices for materials other than crude oil also rose by 2¼ per cent; most notable among the widespread price increases were those for silver and copper.

Higher prices for copper and, to a much lesser extent lead, accounted for almost three-quarters of the 4 per cent increase in the index for the non-ferrous metals industry. This high monthly increase contrasts with a 1 per cent increase in the latest three months. Higher prices for copper, together with brass, also made the most significant contribution to the 1½ per cent increase in the index for the electrical engineering industries.

More than half of the 2½ per cent increase in the index for the metal goods industry was accounted for by higher prices for tinplate and blackplate and precious metals.

The higher charges for electricity were again reflected in a number of the indices for materials and fuel for individual industry sectors in September. In particular they were the main contributors to the 1¼ per cent increase in the index for the bricks, cement, etc, industries (which rose by 6¾ per cent in the latest three months) and to the 1 per cent increase in the steel industries index. Together with higher prices for soda ash they also made the most significant contribution to the 1¾ per cent increase in the index for the pottery and glass industries.

Higher prices for precast concrete goods made the most significant contribution to the 1½ per cent increase in the index for housebuilding materials. The index rose by 6¼ per cent over the latest three months.

Almost half of the 1¼ per cent increase in the index for the paper industries was, as in the previous month, due to higher prices for imported woodpulp, arising from the depreciation of sterling against the dollar.

Almost half of the ¾ per cent increase in the index for the timber industries was accounted for by higher prices for imported softwood.

Higher prices for bacon factory pigs and milk for manufacturing purposes accounted for more than half of the 1 per cent increase in the index for materials purchased by the food manufacturing industries, which now stands at 172.7.

More about wholesale price indices

General inquiries and tables 1, 1a and 2	**01-215 3073** **01-215 3544**
Table 3	
SIC Orders	
II-VI and XII	**01-215 5216**
VII-IX and XVI	**01-215 3549**
XI, XIII-XV and XVII-XIX	**01-215 3548**
Tables 4 and 5	**01-215 3173**

Correspondence: Departments of Industry and Trade, Economics and Statistics Division 4, Room 249, Sanctuary Buildings, Great Smith Street, London SW1P 3DB.

Table 4 Commodities wholly or mainly imported into the United Kingdom

1975 = 100

	1978	1979			
	Sep	Jun	Jul	Aug p	Sep p
Hides, skins and fur skins undressed					
Hides and skins, imported	275.0	377.7	350.0	326.1	331.8
Hides	263.9	380.1	352.2	327.0	333.0
Wet	265.1	384.0	355.3	328.8	334.6
Dry	245.2	322.5	306.0	300.5	291.0
Calf skins	420.7	345.3	321.9	314.0	331.5
Hides and skins, UK origin	292.3	422.1	411.0	395.4	377.2
Hides and skins, UK origin and imported	278.9	402.4	384.7	365.4	354.6
Oilseeds, oilnuts and oil kernels	140.7	158.5	149.3	144.1	139.6
Groundnuts, African, cif Europe [1]	163.0	129.2	128.6	124.7	123.1
Copra, Philippine, cif Europe [1]	232.4	294.7	283.5	268.1	242.6
Palm nuts and kernels, Nigerian, cif Europe [1]	207.7	272.3	251.1	253.8	249.5
Soya beans, US No. 2 grade, cif UK [1]	134.5	152.3	142.5	137.2	132.4
Linseed, Canadian No. 1, cif UK [1]	86.8	105.4	102.3	97.7	103.6
Animal oils and fats	138.5	141.6	132.4	133.3	131.4
Herring oil [1]					
Fixed vegetable oils and fats	121.4	128.7	131.9	124.4	125.6
Cottonseed oil, washed [1]	170.1	238.7	238.7	238.7	238.7
Groundnut oil, London, spot price [1]	114.9	116.4	115.3	115.3	115.3
Olive oil, Spanish edible, max. 1% ffa [1]	68.6	96.0	93.1	95.5	100.6
Linseed oil, cif London/Hull [1]	172.1	167.8	161.9	154.4	150.2
Palm oil, crude, London, spot price [1]	218.0	286.0	282.4	256.3	233.5
Coconut oil, cif Europe [1]	155.8	155.8	168.3	194.0	203.7
Castor oil, Brazilian No. 1 grade [1]					
Crude rubber	191.5	207.8	191.5	184.6	193.7
Natural rubber smoked sheet [1]					
Wood, lumber and cork	150.3	168.3	169.8	172.6	173.9 e
Softwood (delivered to consumers)	172.2	192.8	198.8	199.4	199.9
Hardwood (ex yard or wharf)	143.0	175.8	176.5	175.4	177.6
Keruing	167.3	218.6	220.6	223.0	223.0
Ramin	205.4	217.4	217.4	221.3	222.2
Utile	145.4	167.0	176.0	177.8	176.5
Meranti					
Wood and cork manufactures	154.3	173.3	177.2	177.6	179.0 e
Plywood and blockboard (delivered to consumers)					
Pulp and paper	89.4	102.7	98.3	99.2	101.0
Woodpulp					

	1978	1979			
	Sep	Jun	Jul	Aug p	Sep p
Paper, paperboard and manufactures thereof					
Paper and paperboard	126.9	141.0	141.0	141.3	142.3
Newsprint paper	147.4	166.4	166.4	167.5	171.9
Textile fibres					
Raw wool, greasy or fleece washed, imported	151.2	157.6	155.4	151.5	156.7
Merino	134.4	139.0	136.5	133.0	137.2
Crossbred	172.2	180.8	178.8	174.6	181.0
Raw wool, UK origin	198.8	197.2	193.2	194.6	193.9
Raw wool, UK origin and imported	160.8	165.5	162.9	160.2	164.3
Raw cotton [1]	161.1	153.2	143.7	146.7	150.3
Raw jute [1]	122.3	123.2	127.7	117.1	108.3
Crude fertilisers and crude minerals					
Natural phosphates	72.9	77.8	77.4	76.3	76.8
Asbestos, Canadian, fob Quebec	132.5	136.2	131.8	128.5	131.4
Steatite talc [1]	143.8	166.7	166.7	166.7	166.7
Metalliferous ores and metal scrap					
Bauxite, min. 86% Al_2O_3 [1]	160.1	170.5	170.5	170.5	170.5
Manganese ore, 48-50% Mn grade max. 0.1% P, cif Europe [1]	109.7	102.2	95.5	96.2	97.9
Chrome ore [1]	113.4	105.5	98.7	99.3	101.1
Tungsten ore, min. 65%, cif Europe [1]	176.7	166.7	151.9	154.7	162.4
Titanium ore [1]	109.0	97.7	92.8	93.6	95.1
Non-ferrous metals					
Silver refined and partly refined [1]	142.7	203.4	202.6	207.9	316.4
Copper, LME settlement price [1]	131.9	159.8	143.9	158.4	171.0
Nickel, free market price [1]	112.2	173.4	148.1	142.6	145.3
Lead, LME settlement price [1]	190.0	351.4	304.3	291.2	301.8
Zinc, producers' price [1]	87.9	109.4	102.4	95.2	97.2
Zinc, LME settlement price [1]	96.4	106.6	95.3	88.5	98.3
Tin ingot, min. 99.75%, LME settlement price [1]	229.3	246.4	227.2	214.0	226.7
Magnesium [1]	145.7	145.7	145.7	149.0	149.0
Bismuth [1]	73.2	68.1	60.4	64.1	65.3
Petroleum and petroleum products					
Crude oil [2]	136.6	155.0	159.2	178.1	178.1 e
Chemical elements and compounds					
Mercury, min. 99.99%, cif Europe [1]	111.3	282.8	229.0	229.2	241.1

[1] Source of information: trade publications. [2] Based on unit value of imports at their time of entry. p Provisional. e Estimates which are subject to possible major revision.

Table 5 United Nations index numbers of world export prices

1975 = 100

	Primary commodities									Primary commodities and non-ferrous metals [3]		
	Total			Agricultural non-food			Non-ferrous metals					
	$	£	Purchasers' currencies	$	£	Purchasers' currencies	$	£	Purchasers' currencies	$	£	Purchasers' currencies
1975 1st qtr	102	94	101	103	96	102	104	97	103	102	94	101
2nd	98	93	96	100	95	98	102	97	100	99	94	97
3rd	98	102	99	100	104	101	99	103	100	98	102	99
4th	102	111	104	97	105	99	95	103	97	101	110	103
1976 1st qtr	103	115	108	101	112	105	100	111	104	103	115	108
2nd	105	129	108	107	132	110	111	137	114	106	130	109
3rd	106	133	108	110	138	112	117	147	119	107	135	109
4th	108	145	108	121	163	121	108	145	108	108	145	108
1977 1st qtr	117	152	117	126	163	126	120	156	120	117	152	117
2nd	120	155	119	133	172	132	117	151	116	120	155	119
3rd	116	149	114	118	151	116	114	146	113	116	149	114
4th	116	142	112	117	143	113	117	143	113	116	142	112
1978 1st qtr	118	136	112	122	141	115	119	137	113	118	136	112
2nd	118	143	109	129	156	119	120	145	110	118	143	109
3rd	119	137	105	134	154	118	129	148	113	120	138	105
4th	122	137	105	141	158	121	138	155	119	124	138 r	107
1979 1st qtr	127	140	111	150	165	131	155	171	135	128 r	141 r	114
2nd [4]	142	152	127	158	169	142	166	177	149	143	153	129
3rd [5]	*158*	*157*	*141*	*163*	*162*	*146*	*169*	*168*	*151*	*158*	*158*	*142*

Published by the UN in terms of US Dollars. For convenience the index numbers are also shown in sterling and in terms of puchasers' currencies by converting the dollar index at prevailing exchange rates. [3] This combined index is not published as such by the UN. [4] Provisional. [5] Projections by Department of Industry. r Revised.

Have you a good industrial news picture?

Pictures are published in each week showing developments in British industry. If your company has introduced an interesting new product, if you have received an award, if you have developed a novel manufacturing process, if you have produced the biggest or smallest or heaviest or (you feel) the best designed product, you are welcome to send us a photograph with a short news story. Contributions should be sent promptly – while the subject is still newsworthy – to the Editor, Eleventh floor, Millbank Tower, Millbank, London SW1P 4QU.

APPENDIX F

USE OF RESOURCES IN COMPILATION OF THE WHOLESALE PRICE INDEX

F1. As with any set of government statistics the wholesale price index is produced at a cost, and that cost has to be set against the value of and demand for the indices. In this appendix we shall briefly consider the main aspect of the cost in the shape of the direct manpower needed to maintain and produce the indices each month. There are other elements in the total cost — postage is an obvious one — but they are comparatively small when compared with the direct resources used and they will be ignored here. In addition the resources will be measured in terms of time spent on the work with no attempt to put a money value to that time, mainly because such figures can apply only to one particular period and they lose their impact as that period grows more remote. In this appendix therefore we shall confine ourselves to estimating the number of staff, or man-years, required to produce the WPI. These resources are supplied from both the public and private sector and each will be considered in turn.

F2. Within government the effort resides mainly in the Department of Industry, including the Business Statistics Office, with supplementary assistance from the Ministry of Agriculture, Fisheries and Food and the Department of Energy. The effort here involves the initial development of the indices, the monthly processing of the 11,000 price quotations and the publication of about 600 indices in *British business* (with a further 200 calculated from the basic WPIs for publication in *Price index numbers for Current Cost Accounting*). In addition a large number of queries arise, through the post and on the telephone, from users and some part of the resources of the branch (5 per cent) is devoted to this 'servicing' work. The public sector resources engaged on this work amount to about forty five full-time staff.

F3. The effort required from the private sector is spread out over the 2,500 contributors and the WPI work is but a very small part of the job of those actually involved. If we first consider the routine operation of completing the price quotation shuttle card each month, that requires no more than the insertion of a ditto to indicate no change in price for most months in the year. A change in price entails some extra effort but that is not likely to occur more than twice a year on average. We estimate that five minutes is needed on average to complete the monthly price quotation shuttle card; if this estimate is applied to each of the 11,000 items throughout the twelve months five full-time staff are needed to do the work.

F4. In addition to the routine monthly work described above, time and effort is required from the private sector in the initial setting-up procedures. Given the general level of development work which can be sustained by the branch, there might be about 300 new contributors recruited during the course of a year. The work involved at this point for the contributor — correspondence with the department, discussion of procedures, selection of suitable items — would probably take something between a few hours and a whole day, depending upon the size of the company. We estimate that an average of a half-day at the very most might be spent on this work by each new contributor. If that figure is applied to the total of new contributors it amounts to a full-time task for just over a half-year. Something must be added to cover the time of those companies who are approached but decline to become contributors (about five approaches have to be made to obtain one contributor). Altogether therefore we estimate that the initial setting-up procedures produce enough work to occupy one person full-time.

F5. The other occasion on which extra time and effort is requested from the contributor is when an item for which a price quotation is provided ceases production or undergoes a change in specification. About 500 to 600 specification changes occur each year and the contributor is contacted and asked to help resolve the linking problem (see paragraphs 5.4 and 5.5). On a similar number of occasions an item goes out of production and the contributor provides a replacement. The time and effort required from an existing contributor to provide a replacement item or to assess the effect of a specification change cannot be any more than that required for the initial setting-up exercise. If therefore a half-day is allowed for each occasion the total time spent on this part of the work would occupy two people full-time for a year.

F6. The complete exercise is therefore estimated to require resources equal to fifty three people at the most, within which resources equal to eight people only would come from the private sector. There is no way in which the value of the wholesale price index can be assessed and compared with the value of the input. Given, however, the wide usage of the WPI by both the public and private sectors and the growing importance of the PINCCA indices, the resource requirement could be considered modest.

APPENDIX G

WHOLESALE PRICE INDEX (INPUT AND OUTPUT SERIES) 1954-1979

Wholesale price index of materials and fuel purchased by manufacturing industry 1954-1979

TABLE **A** **1975 = 100**

		Quarterly index	Annual index			Quarterly index	Annual index			Quarterly index	Annual index
1954			30.9								
				1964	1	32.9	33.1	1972	1	43.0	44.4
1955			31.8		2	32.8			2	43.2	
					3	33.1			3	44.5	
1956			33.0		4	33.7			4	47.0	
1957	1	34.5	33.2	1965	1	33.6	33.6	1973	1	51.3	58.8
	2	33.8			2	33.6			2	54.2	
	3	32.8			3	33.3			3	61.3	
	4	31.5			4	33.6			4	68.2	
1958	1	30.9	31.1	1966	1	34.3	34.4	1974	1	85.5	86.8
	2	31.2			2	34.9			2	85.3	
	3	31.2			3	34.3			3	85.6	
	4	31.2			4	34.1			4	90.6	
1959	1	31.3	31.4	1967	1	33.8	34.2	1975	1	92.2	100.0
	2	31.2			2	33.6			2	95.5	
	3	31.4			3	33.7			3	101.8	
	4	31.7			4	35.8			4	110.5	
1960	1	31.8	31.4	1968	1	37.6	37.2	1976	1	115.4	127.0
	2	31.7			2	36.9			2	124.6	
	3	31.2			3	37.0			3	128.9	
	4	31.2			4	37.3			4	138.9	
1961	1	31.1	31.1	1969	1	37.9	38.7	1977	1	144.8	145.6
	2	31.2			2	38.4			2	148.8	
	3	31.0			3	38.7			3	146.5	
	4	30.8			4	39.7			4	142.2	
1962	1	31.4	31.1	1970	1	40.4	40.7	1978	1	140.2	144.6
	2	31.1			2	40.6			2	146.3	
	3	30.7			3	40.6			3	144.9	
	4	31.0			4	41.3			4	147.1	
1963	1	31.5	31.8	1971	1	41.9	42.5	1979	1	153.4	167.6
	2	31.6			2	42.7			2	163.3	
	3	31.4			3	43.0[1]			3	169.9	
	4	32.8			4	42.6			4	183.9	

[1] Revised method of calculation introduced to include levies on certain imported foods.

Wholesale price index of home sales of all manufactured products 1954-1979

TABLE **B**

1975=100

		Quarterly index	Annual index			Quarterly index	Annual index			Quarterly index	Annual index
1954			35.2								
				1964	1	42.8	43.5	1972	1	60.6	62.1
1955			36.1		2	43.4			2	61.4	
					3	43.7			3	62.5	
1956			37.7		4	43.9			4	63.9	
1957	1	38.8	38.9	1965	1	44.4	45.1	1973	1	64.7	66.7
	2	38.8			2	45.1			2	65.0[1]	
	3	38.8			3	45.3			3	67.2	
	4	39.0			4	45.5			4	69.9	
1958	1	39.0	39.1	1966	1	45.9	46.3	1974	1	75.2	81.8
	2	39.1			2	46.2			2	80.5	
	3	39.1			3	46.5			3	83.7	
	4	39.2			4	46.5			4	88.0	
1959	1	39.3	39.2	1967	1	46.6	46.8	1975	1	93.7	100.0
	2	39.2			2	46.6			2	98.5	
	3	39.2			3	46.9			3	102.1	
	4	39.3			4	47.1			4	105.7	
1960	1	39.4	39.8	1968	1	48.0	48.7	1976	1	110.3	117.3
	2	39.7			2	48.6			2	114.5	
	3	39.9			3	48.9			3	119.2	
	4	40.0			4	49.2			4	125.2	
1961	1	40.4	40.9	1969	1	49.9	50.5	1977	1	133.0	140.5
	2	40.6			2	50.3			2	139.6	
	3	41.1			3	50.7			3	143.8	
	4	41.3			4	51.2			4	145.8	
1962	1	41.6	41.8	1970	1	52.3	54.1	1978	1	149.2	153.3
	2	41.7			2	53.5			2	151.8	
	3	41.8			3	54.6			3	154.8	
	4	41.9			4	56.0			4	157.3	
1963	1	42.0	42.2	1971	1	57.5	59.0	1979	1	161.6	172.0
	2	42.2			2	58.8			2	168.0	
	3	42.2			3	59.7			3	176.4	
	4	42.5			4	60.0			4	181.8	

(1) Reductions in this period in the VAT exclusive prices of alcoholic liquor, tobacco and cigarettes, matches and mechanical lighters resulted from lower revenue duties designed to offset additional tax revenue from VAT. Without this charge, index numbers from this period onwards would have been higher by 1.7.

GLOSSARY OF TERMS

The definitions given in this glossary are as the terms apply in the context of the wholesale price index, and they may not necessarily accord fully with definitions given elsewhere.

Base year
The year to which the weights used in the index apply.

Base weighted (index)
An index whose weights are derived from information applicable to the base year.

Basket of goods
A selection of items, which together represent the whole range of goods whose price movements are being measured in a price index. In a base-weighted index the basket's product-mix remains constant from period to period and reflects that of the base year.

Business Monitor
The overall title of a series of publications (available from HMSO) which present, among other things, the results of the quarterly inquiries into manufacturers' sales, conducted by the Business Statistics Office.

Business Statistics Office (BSO)
The division of the Departments of Industry and Trade whose function it is to collect and disseminate statistics relating to businesses. The wholesale price indices are calculated on the BSO computer.

Carry-in, carry-out
A procedure adopted in the compilation, and publication in Business Monitors, of statistics relating to product sales. In aggregating the sales statistics of establishments which have been classified to a particular industry (industry A), the value of sales by those establishments of products which are the principal products of other industries are added into the totals for those other industries (carried-out). Conversely the value of the sales of products which are the principal products of industry A, but made by establishments in other industries, are added into the total sales of the principal products of industry A (carried-in).

Census of Production
A comprehensive statistical survey designed to obtain information from the production industries on their sales, purchases, capital expenditure, etc. Since 1968 this information has been collected in separate inquiries rather than by one comprehensive one.

Composite index
An index which results from the combination of two or more indices.

Constant price data
Value figures which have had the effect of price changes removed. See deflation.

Contract price adjustment (CPA)
A procedure whereby parties to a contract agree to insert into the contract a clause designed to adjust contract payments to take account of inflation, as measured by an agreed index. This procedure is also referred to as a variation of price (VOP).

Contributor
An establishment, enterprise, or Trade Association which supplies price information for use in the calculation of the wholesale price index.

Coverage (of an index)
The ratio, expressed in percentage form, of the value of the total sales of a product by the contributors to the product index to the value of the total sales of that product by all establishments. In the main base year sales values are used in the ratios.

Current cost accounting (CCA)
A procedure whereby the book values of a company's fixed assets and stocks are adjusted in the profit and loss account and in the balance sheet from historical cost to current replacement cost.

Current-weighted (index)
An index whose weights relate to the period covered by the index. The weights of such an index change each period to take into account changes in spending or production patterns.

Deflation
Deflation is a procedure applied to a series of value figures (i.e. the product of price and quantity) to remove from that series the effect of price changes, leaving a series reflecting only volume changes. The deflation of a value series is achieved by dividing it by an appropriate price index or 'deflator'.

First-stage index
First-stage indices are compiled direct from the basic price quotations supplied by contributors. They generally apply to a product group at the lowest level of aggregation, and therefore consist of homogeneous items.

Fixed weights
A set of weights which are used throughout the life of an index. See also base-weights.

Gross purchases
The value of purchases of materials and fuel reported to the Business Statistics Office in the quinquennial purchases inquiry. The value figures include purchases from United Kingdom manufacturers and imports.

Gross sales
Gross sales (total) are the value of sales of principal products reported to the Business Statistics Office in the quarterly inquiries into manufacturers' sales. They include sales to the home market and sales for export. Home sales are gross sales (total) less sales for export.

Gross sector
A descriptive term covering procedures for compiling the wholesale price index which employ weights derived from statistics on gross sales or gross purchases.

Imputation
The procedure adopted when no price quotations or price indicators are available (e.g. in the most recent period) for a product group, even though that product deserves its own weight within its index. In such cases that product's 'spare' weight is given to another product group or shared amongst a set of other product groups i.e. the price movement of a proxy indicator is imputed to the product group with no indicator.

Index number (price index number)
An index number is an attempt to measure the average change between one period and another in the price or quantity of a selection of products. For any particular period the wholesale price index takes the changes in price since the base period of an agreed set of items and combines those changes to produce a weighted average price change for the whole group.

Indicator (price indicator)
Another word for a price index.

Industry
A collection of establishments which have been classified to a sector within the Standard Industrial Classification by reference to the nature of the products sold by each establishment in a period.

Industry-based (statistics)
Industry-based statistics are aggregates — sales, purchases, capital expenditure, etc. — relating to groups of establishments. The purchases inquiry data, which form the basis of the input WPIs, are industry-based, providing figures of purchases by establishments classified to each sector of industry.

Item
A product or material for which a detailed specification exists and for which regular price quotations are obtained from a contributor or a published source.

Lagging
Lagging is a procedure — adopted when the wholesale price indices are being used as deflators — whereby an index value for one period is applied to a later period e.g. the price index for January might be used to deflate the April value figures.

Laspèyres index
A commonly used index formulation, devised by Laspèyres. His index is synonymous with base weighting, and is therefore the formulation used within the wholesale price index.

Linking
A technique whereby an index series can be prolonged by joining two or more series which have been calculated on different bases. Thus an index for all manufactured products on base year 1974 can be linked to the corresponding index on base year 1968 or *vice versa*, as long as the two series overlap at some point in time. This technique can be applied to price relatives within the wholesale price index as well as to aggregate indices.

Manufacturing sector
All establishments classified to Orders III-XIX in the 1968 Standard Industrial Classification.

Minimum List Heading (MLH)
Within the 1968 Standard Industrial Classification and earlier versions this is the minimum level of detail at which statistics by industry (employment, turnover, capital formation, etc.) are normally provided. In the 1980 version of the SIC, the minimum list headings have been replaced by activity headings.

Multiplication factor
The instrument with which a linking operation can be performed. An index calculated on a recent base period can be converted back to the levels prevailing on a previous base period for the same index by the use of such a factor. This technique allows an index series to be extended over a number of rebasing periods, albeit with changing weights.

Net purchases
Net purchases are the residual left after gross purchases have been reduced by the value of purchases from establishments within the same sector.

Net sales
Net sales are the residual left after gross sales have been reduced by the value of sales to establishments within the same sector.

Net sector
A descriptive term covering procedures for compiling the wholesale price index which employ weights derived from statistics on net sales or net purchases.

Order
A grouping of Minimum List Headings within the Standard Industrial Classification which are closely related in terms of types of product, services provided or methods of production.

Price adjustment clause
See contract price adjustment.

Price index number
See index number.

Price relative
The ratio of the current price of an item to its price in the reference year, multiplied by 100.

Principal product
A major commodity group used to define a particular sector of British industry within the Standard Industrial Classification.

Product-based
A description given to statistical information which is summarised in accordance with product totals rather than industry totals. For instance the sales statistics published in Business Monitors represent the aggregation of the sales of the principal products which define an industry regardless of the industrial classification of the producer of those products.

Proxy (proxy indicator)
An index which best represents the price movements of a principal product, or product group or even industry, for which no price quotations are available.

Quality difference
A change in the specification of an item brought about by alterations in its material composition, performance, etc.

Rebasing
The process whereby the wholesale price index is periodically up-dated and reweighted to take account of

changes in the structure of industry and in the pattern of its sales and purchases.

Reference year (period)
The year for which the wholesale price index is set equal to 100.

Response
A measure of the amount of data received from contributors and incorporated into the index for the most recent periods. The measure is obtained by expressing the sales value (in the base years) of the price quotations received as a percentage of the total sales value of all contributors.

Retail price index (RPI)
The index which measures the change over time in the retail prices of a basket of goods which is typical of the purchasing pattern of United Kingdom householders.

Sector
See industry.

Shuttle card
A card which shuttles to and fro between the department and contributor, on which price information is entered. There is one card for each item (see Appendix D).

Specification (of an item)
A detailed description of an item for which a price quotation is received.

Weighting
The process whereby each price relative or index, when combined with other price relatives or indices to form a higher stage index, is multiplied by a number (the weight) which gives that price movement the importance it deserves. In the wholesale price index the weights are based on the relative sales values or purchases values of each contributor, product, or industry in the base year.

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