

WORKING PAPERS

PRICING BEHAVIOUR IN AUSTRALIA

A Data Evaluation Study

by

V. B. HALL

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Pricing Behaviour in Australia: A Data Evaluation Study

"What is...urgently needed is the establishment, maintenance and enforcement of coordinated uniform classification systems by all agencies, private as well as public... . Incompatible data are useless data... .An unreasonably high proportion of material and intellectual resources devoted to statistical work is now spent not on the collection of primary information but on a frustrating and wasteful struggle with incongruous definitions and irreconcilable classifications."¹

For the best part of a decade now, inflation has been an important empirical problem and a major research interest for economists throughout the world. Yet in Australia, there has so far been little attempt to examine comprehensively movements in absolute and relative prices at the level of the sector, the industry or market, and the firm, and there have been no significant quantitative efforts to establish by what methods these prices have been and are being set. This paper demonstrates in a detailed and systematic fashion that the lack of Australian empirical work in this area could well be directly attributable to the unsatisfactory quantity and quality of both time series and cross-section data available. It will therefore categorise in its Summary and Conclusions section those sets of pricing data which are utilisable now, those potentially utilisable in the foreseeable future, and those unlikely to be produced soon but which seem currently necessary for sound quantitative empirical research.

Although this paper is principally concerned with data evaluation, it should also be seen as reporting initial work from a much wider project attempting to shed light on pricing behaviour in the Australian economy at the levels of aggregation mentioned above. Where this paper indicates that sufficient suitable data and other information be available, the project will seek

answers to such basic empirical questions as: i) have relative price movements been significantly dispersed around movements in the aggregate price level (or is it worthwhile examining separately price movements at disaggregated levels)?; ii) which pricing hypotheses of microeconomic theory can be accepted/rejected for which sectors, industries, and firms (or have movements in "microeconomic" prices been consistent with one or more of the existing microeconomic theories of pricing)?; iii) are those pricing hypotheses which cannot be rejected consistent with the rule-of-thumb or other pricing methods purported to have been followed in practice?; iv) what role do foreign prices play in domestic price formation?; v) what role do market disequilibrium (or excess demand) forces play in price formation?; vi) to what extent are the pricing methods used of the short-run or long-run variety?; vii) is the type of market (e.g., competitive, monopolistic, oligopolistic) an important factor in price determination?; and more particularly in line with the "new microeconomics" of inflation perhaps also the further questions of viii) who (i.e., which economic agents) are the price fixers or setters and who have to take prices as beyond their immediate control (e.g., either market determined or government controlled); and ix) in which market (i.e., commodity, labour, or money) or markets are the prices set? Clearly, through the inadequacies of both economic theory and empirical data, not all of the above questions can receive immediate answers. Many of the theoretical obstacles will not be surmounted in the short run, but by presenting in this paper an evaluation of the nature and reliability of the empirical data available, it will be possible to indicate those questions which cannot be tackled for empirical reasons.

1. Basic guidelines as to acceptability of Data and Data Sources investigated

Because most empirical research in Australia, as elsewhere, is done with data of a largely incompatible and "best available" nature, it is first necessary to acknowledge that the major guideline in this paper as to data acceptability is provided by the above quote from Professor Wassily Leontief's 1970 Presidential Address to the American Economics Association. The importance of these basic principles has since been emphasised for Australia by the Crisp Committee in concluding that a major deficiency in existing Australian official data systems is that they are not well or properly coordinated and that "as a result of this uncoordinated approach: there is a lack of compatibility between different data systems (in terms of classifications, definitions, coverage, etc.)"²

Thus, the strategy behind this data paper has been first to establish the existence of as much time series and cross-section data (whether piecemeal or uniform) as possible, then to reject for subsequent econometric and other use that which lacks sufficient comprehensiveness or uniformity, and finally to point out those areas where comprehensiveness and uniformity should be aimed for in future collection and publication procedures. In appraising data for possible rejection it had to be kept in mind that reliability was necessary not only for the pricing data but also for those other series required if econometric work were to be undertaken.

With respect to the Data Sources investigated, it is necessary to point out that this study is concerned with the prices of consumer and/or producer goods and services³ rather than with asset or capital goods prices, that public sector pricing is also not a specific consideration, and that it requires not only pricing data but also where it exists information on pricing methods said

to have been followed in practice. Accordingly, the following sources were researched:

Official data from publications of the Australian Bureau of Statistics (ABS);

Survey data from the Department of Industry and Commerce's "Quarterly Survey of Manufacturing Industry," the Associated Chambers of Manufacturers of Australia/Bank of New South Wales (ACMA/Wales) "Survey of Industrial Trends," and the Associated Chambers of Commerce/National Bank (ACC/Nat. Bank) "Quarterly Business Survey";

Reports of the Prices Justification Tribunal (PJT);

Report of the Committee on Integration of Data Systems (Crisp Committee);

Reports of the Parliamentary Joint Committee on Prices (PJC);

The Pricing Method of the South Australian Commissioner for Prices and Consumer Affairs;

Report of the Committee to Advise on Policies for Manufacturing Industry (Jackson Committee);

Reports of the Tariff Board/Industries Assistance Commission (IAC).

2. Official Data from publications of the ABS

The data discussed in this section (i.e., the Consumer Price Index, Wholesale Price Indexes, Import Price and Export Price Indexes, and Mineral Industry Price Indexes) are all actual price data. Appraisal of implicit price deflators constructed from official sources is left until section seven.

(i) Consumer Price Index⁴

This is perhaps the most widely known price index, with the current Consumer Price Index (CPI) having been first published in 1960 retrospective to the September quarter of 1948. The Index is "...designed to measure quarterly variations in retail prices of goods and services representing a high proportion of the expenditure of urban wage-earner households in the

aggregate."⁵ Coverage is arranged in the five major groups of Food, Clothing and Drapery, Housing, Household Supplies and Equipment, and Miscellaneous, and then further in sub-groups.

By sample survey standards the CPI provides a relatively comprehensive coverage of retail prices, but the data have the considerable disadvantage at present of being classified solely from the consumer point of view,⁶ and are therefore not published on a basis consistent with many other economic time series. So, for the purposes of this paper and in terms of the Leontief criteria, it is concluded that the CPI data are unlikely to be of any significant immediate use for comprehensive micro-economic pricing behaviour work, even if the majority of prices were to be found market determined rather than producer set.

(ii) Wholesale Price Indexes⁷

Data collected for compilation into wholesale price indexes are potentially the most useful of all price data for microeconomic studies of pricing behaviour. This is because they are output or producer prices, and even though it is often necessary⁸ for researchers to re-weight the basic data, it is a reasonably practical exercise to obtain price data classified on the same basis as other relevant series.

However, in Australia, the collection of basic wholesale price data and publication of any resulting series seems until very, very recently to have been both minimal and fragmented. More specifically, two major initial criticisms are that the published indexes are few in number and that those few have not appeared on a regular consistent basis. For example, the Wholesale Price (Basic Materials and Foodstuffs) Index was not only confined to prices mainly collected from Melbourne sources, but also is now obsolete through

having been discontinued with publication of the December 1970 monthly figure. Clearly, because of its being confined mainly to Melbourne sources, it would not even be suitable for reworking into an alternative classification system for the years it was available.⁹

Fortunately, the wholesale price indexes published more recently provide greater potential for research work, as even though they are as yet relatively limited both in number of series and number of observations, they are said to be part of a (well overdue) long-run program to publish a very much expanded range of wholesale price indexes.

Early publications in the long-run program were the two narrowly based special purpose indexes: the Price Index of Electrical Installation Materials introduced in 1964 and available monthly since early 1969; and the Price Indexes of Copper Materials used in the Manufacture of Electrical Equipment introduced in December 1972 and available monthly since July 1968.

Then came several somewhat more widely based series: the Wholesale Price Index of Materials used in Building other than Housebuilding, introduced in April 1969, available monthly from July 1966, and "...the first of a series of indexes being prepared as circumstances permit and relating to materials used and articles produced by important and defined areas (or 'sectors') of the economy";¹⁰ the Wholesale Price Index of Materials used in Housebuilding, introduced in November 1970, available monthly from July 1966, and "...the second in the series of indexes...and complementary to [the first] index";¹¹ and the Wholesale Price Index of Metallic Materials used in the Manufacture of Fabricated Metal Products, introduced in December 1972, available monthly from July 1968, and "in addition to constituting a further step in the publication of an expanded range of wholesale price indexes, this index and the [above mentioned] Price Index of Copper Materials used in the Manufacture of Electrical

Equipment have been designed as a modern replacement for the metals components of the Wholesale Price (Basic Materials and Foodstuffs) Index."¹²

In light of the Leontief criteria, however, the most promising aspect accompanying publication of the latter was the declaration that it

"...includes important metallic materials selected and combined in accordance with a weighting pattern reflecting value of usage as reported at the 1968-69 Census of Manufacturing Establishments for establishments classified to... (Australian Standard Industrial Classification [ASIC] Sub-division 31)",¹³ i.e., there has been explicit recognition that output price indexes should be capable of compilation on a basis consistent with the current ASIC.

The recent appearance on 4 July 1975 of a Wholesale Price Index of Materials Used in Manufacturing Industry is perhaps an even more encouraging development, even if it may be utilisable in econometric work only in the medium term future. This index "...completes the presentation of a set of price indexes which replaces the Wholesale Price (Basic Materials and Foodstuffs) Index",¹⁴ is compiled on a net basis from data classified to Division C (Manufacturing) of the ASIC, and is available on a monthly basis from July 1968. The degree of disaggregation of these essentially materials and fuels indexes so far published is not at all considerable, but it is encouraging to note that the "ABS intends to develop a set of prices relating to major ASIC sub-divisions of the Manufacturing Division. The proposed indexes will reflect movements in prices of materials used and articles produced by particular sub-divisions (e.g., sub-division 23, Textiles) and will therefore include materials which are the products of other sub-divisions and which are not within the scope of the current index."¹⁵ This statement of intent clearly encompasses at the two digit disaggregated level the ABS' promise that "A further price index, currently under development, will relate to

articles produced by manufacturing industry in Australia",¹⁶ although at present "There are no statistics available of the prices received by manufacturers."¹⁷

Hence, although the relevant wholesale price indexes are not presently available, it seems likely that in the medium-term future there will be a certain number of wholesale price indexes for manufacturing industry published on a monthly basis in accordance with two digit sub-divisions of the ASIC and relating to both net input (i.e., materials and fuels) and output prices. Only when these data are available back to the fiscal year 1968/69 can pricing behaviour work based on the manufacturing division of the ASIC classification be begun in some degree of depth.

Unfortunately there seem to be no similar promises for the publication of wholesale price indexes related to other major areas of the ABS' integrated censuses (i.e., for the mining, electricity and gas, wholesale trade and retail trade industries), nor for the rural sector or the rest of the tertiary sector.

(iii) Other Price Indexes

Other published price indexes are fairly well known to be both less comprehensive and less reliable than those already mentioned, but are mentioned briefly for completeness of appraisal.

(a) Import Price and Export Price Indexes

The ABS does not publish an import price index, and the import price indexes published monthly by the Reserve Bank of Australia¹⁸ have such considerable limitations¹⁹ that they can be rejected for use in disaggregated price work both on the grounds of reliability and because their classification lacks compatibility with either the retail or wholesale price series.

There do exist, however, certain official export price indexes which are published in both aggregate form and for a number of major product groups.²⁰ Such series exist on a monthly basis from 1959-60 to 1968-69 and then as an interim linked series from June 1969 pending completion of a comprehensive review and re-basing, but again the existing degree of disaggregation is both limited and lacks sufficient consistency with other classifications.²¹ Even if the existing disaggregation were compatible with the Standard International Trade Classification (SITC), and therefore with the Australian Export Commodity Classification (AECC) or the Australian Import Commodity Classification (AICC), these classifications are substantially different from the ASIC. The Jackson Committee stresses that "Of particular importance to industry is the need to complete development of the proposed Australian Standard Commodity Classification (ASCC) so that international trade and production statistics can be compared".²² The Crisp Committee provides some note of optimism, though, that "while different commodity classifications, for example, are used at present for statistics of domestically-produced goods, imports and exports, a standard commodity classification is being developed by the Bureau to permit linking of these series on a common basis".²³

Hence, it must be concluded at present that in neither of the Import Price Index nor the Export Price Index areas are sufficient suitable data available to permit consistently classified disaggregated price behaviour work.

(b) Mineral Industry Price Indexes

A number of series are published for actual metals and minerals prices.²⁴ These are variously domestic and export prices, but seem not part of any consistent classification, with the exception of the Price Index of Metallic Materials

Used in the Manufacture of Fabricated Metal Products which "...comprises important metallic materials selected and combined in accordance with... (ASIC Manufacturing Sub-division 31)".²⁵

3. Survey Data

Three major surveys were investigated in the hope that they might provide potentially useful pricing data on a comprehensive basis: the Department of Industry and Commerce's "Quarterly Survey of Manufacturing Activity", the ACMA/Wales "Survey of Industrial Trends", and the ACC/National Bank "Quarterly Business Survey".

(i) Department of Industry and Commerce: Quarterly Survey of Manufacturing Activity"

No "hard" information is requested in this Survey on either prices or costs. Instead the request is simply for information on actual percentage changes during the three months to date and on the expected percentage changes during the following six months. More precisely, the questions are in the form:

| | Actual % change during <u>three months</u> to 31 December 1977 | | Expected % change during <u>six months</u> to 30 June 1978 | |
|--|--|------|--|------|
| | UP | DOWN | UP | DOWN |
| 11. COSTS | | | | |
| Average change in unit cost; all items | % | % | % | % |
| 12. PRICES | | | | |
| Average change in unit price (commercial basis) of goods manufactured by this establishment | % | % | % | % |

There are certain fairly obvious initial problems associated with any attempt to use data from this survey. For example, it would be necessary to reconcile the data to a common three month or six month time period if the expectations data were to be utilised, the number of time series observations is not great (as the Survey has been conducted only since 1970), there are the usual percentage coverage and percentage response doubts associated with any Survey,²⁶ and the basis of classification of data may or may not be consistent with any of the official data classifications referred to in sections two and seven.²⁷ But most likely more than outweighing these problems is the benefit that there are further data available on sales, orders, stocks of materials, stocks of finished goods (all in \$'000), on percentage utilisation of capacity, on total hours of paid overtime, and on number of employed persons. These additional figures are available in "actual" and "normal" form for each of the most recent three monthly periods, and in "expected" or "normal" form for the coming six months. An especially important aspect of this additional data is that they will enable testing for a number of possible market or excess demand influences on pricing behaviour.

Overall, therefore, even if the industry classification were not found to be consistent with other classifications (especially the ASIC), the classification of data within the Survey is at least internally consistent, and once the problems referred to above have been satisfactorily resolved, the data are almost certain to be sufficiently suitable for comprehensive cross section (and time series) study of pricing behaviour.

(ii) ACMA/Wales "Survey of Industrial Trends"

In this Survey also, no "hard" information is requested on either Prices or Costs.²⁸ This is further the case for the other variables on which

information is requested, i.e., numbers employed, overtime worked, new orders received, orders accepted but not yet delivered, output, stocks of raw materials, and stocks of finished goods.

The precise form in which the information is sought is:

PAST AND FUTURE TRENDS

Excluding normal seasonal changes, what has been your company's experience over the past three months and what changes do you expect during the next three months in respect of

- 11. Average Costs per unit of Output
- 12. Average Selling Prices

| Change in position during the PAST THREE MONTHS | | | Expected change during the NEXT THREE MONTHS | | |
|---|------|------|--|------|------|
| Up | Same | Down | Up | Same | Down |
| | | | | | |

There are at least two basic methods available²⁹ for converting data of the above form into time series observations suitable for econometric work, and at the aggregate level of manufacturing activity for both actual and expected average selling prices the appropriate conversions have been done by Danes [4] on a quarterly basis from the June quarter of 1966.

However, in the field of research into pricing behaviour, it is this Survey's data at the disaggregated level which is likely to be the more useful. One classification, available from June 1966 to date, is according to size, in the four categories of 1-50 employees, 51-200 employees, 201-1000 employees, and over 1000 employees; a second classification is by industry, where there are eight industry groupings from June 1966 until March 1974 and twelve industry groupings from June 1974 to date; and the third classification, available from June 1966 to date, is according to nine different types of product. On the important question of whether either industry grouping is consistent with any

of the already cited classification systems, the twelve industry groupings are said to approximate ASIC Manufacturing Sector Sub-division classifications, and are fairly readily convertible back to the original eight industry groupings should a longer set of consistent time series observations be required. The eight industry grouping, however, is not known to be consistent with any other classification system.

Hence, for data availability from this Survey, and bearing in mind that the Average Selling Price and Average Costs questions were first included only in June 1966, conclusions are basically the same as for the Department of Industry and Commerce Survey. Notable differences, though, are that these data extend back further in time, are available in both employment and product as well as industry categories of disaggregation, but require all raw data to be converted into more suitable series before econometric work can be undertaken.

(iii) ACC/National Bank "Quarterly Business Survey"

This Survey covers "...retailing, wholesaling, merchandising, transport, building and services activities, but not manufacturing. Its results are reported in Quarterly Business Survey."³¹ At first sight, it would appeal as an extremely useful complement to the AQMA/Wales Survey, especially seeing that it requires answers to similar questions in basically the same form (i.e., Up, Same, etc.).

Unfortunately, it fails to include a question on selling prices, and therefore cannot be of use for research into pricing behaviour.

4. The Prices Justification Tribunal

A considerable amount of time was spent researching the reported activities of the Prices Justification Tribunal (PJT), as it was felt that not only

was there the possibility of its developing into a useful source of consistent data³² but also at least as importantly because there was the possibility of obtaining reputable declarations by companies as to their actual price setting methods.

At the outset of this investigation, therefore, it was thought that the potential gains from a previously unavailable source of information on both data and pricing methods could well more than compensate for a number of its already known deficiencies. These deficiencies would be:

- (i) the information would constitute neither a comprehensive nor a representative sample, as it would relate only to companies coming within the relevant Legislation, i.e., initially those companies with an annual turnover exceeding \$20 million, and subsequent to the passing of the 1974 amendment, also those companies singled out for inquiry and report irrespective of their turnover (and envisaged as being primarily in the retail price and imported goods price areas);
- (ii) the Act came into force only as recently as 1 August 1973, and therefore time series observations would be very limited in number;
- (iii) the lack of any requirement for regular provision of information (e.g., every quarter) as information needed to be furnished only whenever a prices justification application had to be made;
- (iv) the absence of any requirement that a company state on what specific basis it sets its price. This too stems from the basic legislation bringing the Tribunal into existence. The Act required the PJT to be a prices justification body and not either a price controlling authority³³ or a price fixing authority.³⁴ There were no guidelines or criteria in the Act as to what constituted a justified price³⁵ or what the Tribunal should observe in its consideration of claims for price increases.³⁶ The development of guidelines and criteria was left up to the

Tribunal itself,³⁷ and their initial requirement in July 1973 was as set out in Form No. 1 (re. notification of prices pursuant to Section 18(1)(a)) and Form No. 2 (re. notification of prices pursuant to Section 18(2)(a)):

"The reasons for the proposed prices are as follows:
 (here set out in such detail as is considered appropriate the reasons for the price increases
)³⁸

Forms 1 and 2 therefore seemed designed to attract information relating to price increases rather than to price levels. But in practice the actual pricing methods used by some firms would have related directly to price changes and by others directly to price levels; some pricing methods may also have been consistently applicable for both price changes and price levels. So, it would clearly have been preferable for Forms 1 and 2 to require information first on the specific pricing method used and then on the relevant change form or level form data. However, even for the very broad manner in which Forms 1 and 2 were worded, they clearly attracted insufficient overall and specific information to satisfy the Tribunal, and they were soon replaced in July 1974 by Circular Memorandum No. 2. This Memorandum, although still not requiring any declaration of pricing method and price levels and although framed in suggestive form only, did at least suggest headings for more specific information as follows:

" SECTION A DETAILS OF THE APPLICATION

-
- 4. Details of price increases showing previous and proposed prices
.....
- 5. Earlier price increases
.....

SECTION B JUSTIFICATION FOR THE PROPOSED PRICES

-
- 6. Details of cost increases and decreases
 - (a) Material and fuel costs
.....
 - (b) Labour costs
.....
 - (c) Cost savings
.....
 - (d) General
.....
- 7. Changes in productivity and efficiency
.....
- 8. Output capacity and level of capacity utilised
.....
- 9. Marketing
.....
- 10. Net profits and net funds employed in the business
.....

„39

The information provided in response to this Memorandum, if collected regularly and consistently, would clearly be capable of contributing to or constituting in itself a very useful data base. But the continued lack of requirement for specific information on pricing methods and price levels, together with the fact that the Reports published by the Tribunal have related only to that minority of

of companies facing a public inquiry, has meant that only snippets of information on actual pricing methods said to have been followed have become available. Snippets from the following Reports have been discovered and are presented for appraisal as to usefulness as supplementary pricing behaviour information:

- (i) Report by Prices Justification Tribunal, The Broken Hill Proprietary Company Limited and Australian Iron and Steel Company Limited, Matter No. N73/7, 10 October 1973.

Four specific criteria were put forward by the company, these being termed:

- (a) the "earnings test", whereby "...a company is justified in charging prices for its products which will enable it to earn a reasonable return on funds employed in the industry... commensurate with the risks involved";⁴⁰
- (b) the "new investment test", whereby "...a company must be permitted to fix prices at a level which will enable new investment to be justified as a proper use of funds";⁴¹
- (c) the "comparative prices test", whereby "...comparison of a company's prices with prices which efficient overseas producers charge in similar circumstances provides a reasonable measure for judging the company's price levels";⁴²
- (d) the "cost increase test", whereby "...the steel industry should not be obliged to absorb cost increases which are outside its control or otherwise reasonably incurred".⁴³

The Tribunal then concluded from this and other evidence available to it on the companies' pricing policy in the domestic market that "it seems to us that the policy has been to try to reach a target net profit margin on full costs...at 'normal' levels of utilisation. These 'theoretical' target prices have been modified...by differences between products due to competition

from imports and alternative materials, differences in general in the sensitivity of demand to price, and differences in the importance attached by the Companies to achieving a high level of sales of a particular product".⁴⁴

- (ii) Report by Prices Justification Tribunal, Australian Paper Manufacturers Limited and Cellulose Australia Limited, Matter No. N73/62, 24 October 1973.

The Tribunal was of the opinion that "A.P.M.'s pricing procedure was broadly to set a profit target for the ensuing year, to budget for known cost increases and also for cost increases which it expected would occur, and to arrive at a figure for a price increase which would ensure realisation of the profit target".⁴⁵ "Although this is the basic approach it obviously can't be reduced to a formula and the final price decided on must depend on many factors."⁴⁶

- (iii) Report by Prices Justification Tribunal, General Motors-Holden's Pty. Limited and General Motors-Holden's Sales Pty. Limited, Matter No. N73/770, 21 December 1973.

The company claimed its pricing policy to be based on "...known costs of production and market considerations",⁴⁷ and the ACTU claimed "...its policy was aimed at profit maximisation".⁴⁸

- (iv) Report by Prices Justification Tribunal, The Broken Hill Proprietary Company Limited and Australian Iron and Steel Proprietary Company Limited, Matter No. N74/1637, 28 March 1974.

The Tribunal was of the opinion that "...unit price or unit revenue is relevant to its considerations and in examining costs, it is therefore logical to consider the average cost of production of a unit of output. This is a reasonable starting point for assessing costs",⁴⁹ and also that "...we do not accept automatically the convention in some sectors of the economy of translating cost increases into higher profits by means of application of percentage mark-ups to cost increases in arriving at price increases. Each case must be considered on its merits".⁵⁰

(v) Report by Prices Justification Tribunal, Arnotts Limited, Matter No. N74/2534, 13 September 1974.

The company stated that "The basic aim was to achieve an operating profit before tax and interest of not exceeding 10% of sales."⁵¹

Many other cases before the Tribunal rested monotonously on prices being set so as to recoup actual unavoidable increased costs.

Two other summary judgements expressed on pricing methods are worth quoting. One is that of Hogan who considered that "In essence, the Tribunal is working on average costs per unit of output; the discussion of export markets appears to set a firm position against notions of marginal pricing behaviour".⁵² The other is the more wide-ranging comment by Norman that "As the influence of public bodies in the pricing process becomes more pervasive, the relevance of supply-and-demand, marginalist and even 'corporate power' theories of price behaviour must be questioned increasingly. A theory of institutionally-determined prices, based on specified institutional procedures, is required... The conventional theories of neither pricing nor distribution would seem capable of handling manageably the intrusion of institutions. Study of a formal approach to institutional behaviour may also assist in the reformulation of econometric approaches to price behaviour... The study would suggest that econometric equations presuming given percentage mark-ups over normalised units costs... may in future need amendment to account for prices subject to PJT jurisdiction, in which mark-ups may not even be maintained in money terms. Price equations linear, rather than log-linear, in cost variables, and the use of extraneous information could much improve the performance of price relations run for the period from middle 1973 in Australia."⁵³

Hence, with respect to the two basic reasons advanced at the beginning of this section as to why data from PJT sources could possibly have been useful, it can now be concluded that on the question of information on actual pricing methods, less has been learned than expected. Nothing substantially new on types of pricing methods has emerged which could not have been picked up from any good elementary applied microeconomics text.⁵⁴ However, the few snippets of information quoted above from published PJT Reports are potentially useful for pricing behaviour work at the level of the industry and the firm, and ideally should first be supplemented by any further information relating to that very much larger group of companies for which the PJT have not presented published Reports. The information sample could, of course, have been larger still if a specific question as to the company's pricing methods and/or objectives had been put in Circular Memorandum No. 2 by the PJT.

On the question as to whether the PJT might be able to produce a readily available set of consistent pricing and other data, this hope too is unlikely to be realised in either the immediate or the foreseeable future. There appears to have been no reported progress along the specific lines envisaged in the Prime Minister's letter commissioning the Crisp Report, and more recent information⁵⁵ on the PJT's data base seems to suggest that the coverage and direction of its information system is already considerably less than originally envisaged. So, it may well turn out that even the limited information suggested in Circular Memorandum No. 2 would be inappropriate for serious comprehensive econometric work, and the earlier mentioned deficiencies will also of course remain as further obstacles.

5. Report of Committee on Integration of Data Systems (Crisp Committee)

There are two aspects of this Report which are particularly relevant to this research: its emphasis on the present lack of coordination of existing official data systems and its consequent recommendation for better integration; and its provision of useful information on specific pricing data deficiencies.

On the broader question of integration, the basic attitude of the Committee on the overall lack of compatibility between different Australian official data systems has already been pointed out in section one. The current situation is that "The Bureau published, in 1972, the first results of its integrated economic censuses of industry, for the year 1968-69, and it has since published data up to the year 1971-72. The statistics so far produced cover only manufacturing, mining, electricity and gas production and distribution, and retail and wholesale trade sectors of the economy. No 'integrated' data have been produced yet for the rural sector or for the rest of the tertiary sector. Although the Bureau has long-term plans for extension of the integrated system to all other important sectors of the economy it does not at present expect these extensions to be accomplished for a number of years."⁵⁶ Hence, for the purposes of this research, there is clearly no point in searching for comprehensive data for the rural or much of the tertiary sector. Confirming this is the statement in the 1974-75 Industries Assistance Commission (IAC) Annual Report that "Steps have now been taken by the Australian Bureau of Statistics to collecting annually production and financial data on an integrated basis for the rural sector. With regard to the services sector, the Bureau is taking steps to extend the area of integration and where data are collected on a periodic basis to reduce the interval between collections.

The Commission's ability to pursue sector and economy-wide analysis will be enhanced as the Bureau's planned extension of an integrated data system proceeds".⁵⁷ So if the basic requirement is for a consistent data base, then this could be forthcoming only for the manufacturing sector and perhaps for the mining sector. All this accords with the Jackson Committee reporting that "Since 1968-69, the ABS censuses of mining, manufacturing, electricity and gas, wholesale trade and retail trade, have been conducted on an integrated basis. Previously censuses were of a specific purpose nature without common definitions of data or a common system of reporting units. No standard industrial classification existed so that industries boundaries were not defined in ways which would prevent overlapping or gaps occurring between the industrial sectors covered by the censuses,"⁵⁸ and the IAC writing that "Most of the research and statistical data in this report relates to the manufacturing sector. Research on a sector-wide basis regarding the manufacturing sector has been carried out for several years by the Commission and the Tariff Board. This has been possible because data have been collected annually on an integrated basis for this sector for a number of years. In other sectors, except mining, most of the data have been either collected only periodically or on a non-integrated basis."⁵⁹

With respect to pricing data deficiencies, the Report highlights very early on the summary conclusion that "There appear to be quite important deficiencies in the data presently available about movements in the prices of different goods. Published price indices at present available relate only to very broad categories of goods. More detailed information about price trends would throw light on the way price increases are transmitted through the economy. And if such additional information as becomes available were

structured to provide a common price-data framework for the separate institutions where advice to governments has the capacity to influence prices in particular areas, this would enable governments and the community to evaluate and relate the work of these separate institutions. It would also reduce the risk which exists in the absence of such a common framework-- that the separate institutions may attempt to develop price data-system independently of one another in an uncoordinated way, and with incompatible results."⁶⁰ This summary judgement is based on:

- (i) the principal deficiencies in existing ABS collections being reported⁶¹ in submissions as:

"7. PRICES STATISTICS

- (i) Finer commodity detail in export price index
- (ii) Finer commodity detail in import price index
- (iii) More comprehensive and timely wholesale price indexes
- (iv) More detailed price information relating to industry sectors
- (v) Comparable price series at all points in marketing chain for agricultural commodities
- (vi) Improved quality and publication timetable of quantum indices for factory production "⁶²

and

- (ii) the list of requirements⁶³ for new statistics submitted to it as:

"9. PRICES STATISTICS

- (i) Freight costs and wholesale and retail prices
- (ii) 'Cost of Living' statistics
- (iii) Suitable price indices for escalation clauses in building and construction contracts
- (iv) Monthly indices for producers' prices for:
 - major manufacturing commodities
 - major agricultural commodities
 - major mining commodities
- (v) Monthly indices of purchasers' prices for:
 - materials used in manufacturing activity
 - materials used in mining activity "⁶⁴

This information submitted on principal deficiencies and requirements for new statistics will be taken into account when drawing final conclusions in section eight, and whether there is in fact sufficient (annual) pricing and other data available to constitute a consistently classified data base for the manufacturing (and perhaps mining) sector will be discussed in detail in section seven.

6. Miscellaneous Sources

(i) Reports of the Parliamentary Joint Committee on Prices

Reports of the PJC were investigated as a possible source of opinion on price setting methods. A clear and concise description of the Committee's activities appears in Nieuwenhuysen [14, p. 10]. As with the PJT, only more so, coverage of the pricing area is not at all comprehensive, and following appraisal of the five Reports mentioned in Nieuwenhuysen, this source was not considered for further use.

(ii) South Australian Commissioner for Prices and Consumer Affairs' Pricing Method

As with the PJC (and to a considerably lesser extent with the PJT), the principal information sought here related to pricing methods rather than to pricing data. The search was again of very limited value, as the pricing formula (which had its origin about 30 years ago⁶⁵) was designed and utilized for price control purposes⁶⁶ rather than for prices justification or price setting purposes. Nevertheless, it did throw up for Shell and Related Companies the target net margin concept, whereby "The formula is applied to weighted average industry prices... To calculate the price of each product the formula takes the current price of the product and subtracts various costs until a net margin figure is obtained. The method, as used by the

Companies to calculate the increases in prices proposed on this occasion, was as follows:

| | |
|---|-----|
| Current Selling Price | |
| Less Landed Costs in the two-monthly period | |
| Less Freightng Costs | |
| Less Additional Costs of Local Crude | |
| Less Distribution Expenses | |
| = Net Margin | .67 |

(iii) Report of the Committee to Advise on Policies for Manufacturing Industry (Jackson Committee)

This Report, relating to the manufacturing sector only and published after the Crisp Report, also considered the existing data situation to be sufficient cause for concern, so that "A detailed statistical picture of manufacturing is presented in Volume II along with a guide to further sources of information, and comments on the gaps and deficiencies in available statistics."⁶⁸ Their comments clearly were not confined only to prices, but on prices their summary conclusion was that "In the field of price and related indexes, more work needs to be done in developing more detailed export price indexes and in producing official import price indexes. On a more general level, there is little available information on the prices paid by industry for their inputs (materials, machinery, labour, capital and land) and the prices of their outputs. Indices of prices, wages and interest rates would be invaluable for both industry policy makers and business, particularly if on an industry basis."⁶⁹

This provided very little new, though, as much of this is already evident from section one, and a more detailed appraisal of the state of manufacturing (and mining) industry pricing and other data follows in the next section.

7. Reports of the Tariff Board/Industries Assistance Commission

Although both Annual and Specific Reports of the Tariff Board/ Industries Assistance Commission were researched for information on the manufacturing and mining sectors, by far the most useful material was contained in chapter 2 and Appendix 2 of the Annual Report of the Tariff Board, 1970-71. Detailed examination of their work meant that attention also had to be given to the annual Factory Census results published variously in Secondary Industries Bulletin - Part I (1949-50 to 1962-63), Manufacturing Industry Bulletin (1963-64 to 1967-68), the Census of Manufacturing Establishments results published in Manufacturing Establishments - Details of Operations (ABS Ref. No. 12-29) (1968-69 to date), and the work done thereon and published recently by Hancock [10].

Three major issues immediately become apparent with respect to the data for the manufacturing sector, viz: i) what is the type and quality of the price and other data, and more particularly what would be the relative merits associated with using actual price series and implicit price deflator series? ii) which is the most suitable data classification system, as the Tariff Board/IAC classifications differ from those of the Commonwealth/ Australian Statistician? iii) for what time periods would annual consistently classified data be available, bearing in mind especially the application from 1968-69 of the ASIC?

(i) Actual Price Data and Implicit Price Deflator Data

With respect to actual price data, the extremely limited availability of wholesale price indexes has already been discussed in section one. It is therefore not a practical proposition to contemplate using actual price data at present, and resort must be had by default to implicit price deflator data. Because deflators are not the result of direct measurement, though,

their possible use immediately requires some appraisal of problems of measurement.

Any implicit price deflator can be defined in general terms as:

$$\text{Implicit Price Deflator} = \frac{\text{volume of production at current prices}}{\text{volume of production at constant prices}}$$

and ideally any such series clearly requires firstly that coverage of the volume of production variables in both the numerator and denominator be of consistent classification, and secondly that both definitions of volumes of production be the same, i.e., either both be calculated on a net value-added basis or both on a final output basis. This ideal is not able to be achieved for recent Australian data, though, as study of the data available and of the two recent studies cited above show.

Taking the Tariff Board value added based definition⁷⁰ as

$$\text{PVA} = \frac{\text{YV}}{\text{YR}},$$

where

YV = Value of Production Index

YR = Volume of Production Index

PVA = Implicit Price Deflator Index, using YV as numerator, and Hancock's final output based definition⁷¹ as

$$\text{PEF} = \frac{\text{YVO}}{\text{YR}},$$

where

YVO = Value of Output

PEF = Implicit Price Deflator Index, using YVO as numerator, and referring also to the definition, coverage and classification of the variable YR in Indexes of Factory Production in Australia, 1949-50 to 1967-68 (ABS Ref. No. 12.5), it can be concluded that while both numerator series

are consistent with the classification of the other manufacturing industry variables obtained from the annual census, there is no denominator series corresponding exactly with either numerator series. The difference of opinion between Tariff Board and Hancock as to the more appropriate numerator series is therefore likely to be at least partly due to differences in interpreting what the denominator series YR really represents.

Before evaluating the worth of either of these implicit price deflator series, therefore, it is first necessary to consider the variable YR and to determine from a definitional point of view both the reliability and coverage of YR in itself, and whether it is closer in concept to YV or to YVO.

With respect to YR itself, which is the only volume of production series available and hence had to be chosen by both the Tariff Board and Hancock, considerable reservations must be expressed; and whether YR is closer to YV or YVO cannot be determined with complete certainty. The Statistician's annual indexes of factory production at constant prices seem to be an attempt at producing indexes to represent value added at constant prices for both individual Classes and All Classes Combined. The usual numerous problems associated with attempts of this kind are detailed in Indexes of Factory Production in Australia, 1949-50 to 1967-68 (pp. 2-9), but there seem also to be particular problems associated with whether the resulting indexes at constant prices actually reflect better the "value added" or the "value of output" concept. Putting this more precisely, it can be stated that apart from problems arising through lack of basic raw data, there can be inadequacy due to the basic method of construction of the Class and All Classes Indexes as "...the Australian indexes are indexes of output at constant prices for individual

sub-classes, which are combined by the use of base-year value-added weights into indexes for each class and all classes combined. They provide a convenient summary, for purposes of economic analysis of a great variety of detailed statistics, and can be used as broad indicators of growth in manufacturing industry."⁷² It would not seem they were ever designed or intended for use in obtaining implicit price deflator series.

However, some empirical checking out of the overall reliability of the basic method of calculation was attempted by the Bureau, as there was "Comparison of indexes on a net output formula...with the indexes based on gross output and value-added weights... .Net output indexes were in fact calculated for those sub-classes...approximately 40 percent of the total value of factory output. Although for some sub-classes the two indexes showed different movements, a net-output index for the combination of the available sub-classes was similar in its overall movement to a gross output index with value-added weights for the same sub-classes."⁷³ This seems to suggest that the resulting Class and All Classes Combined Indexes for the 40% sample available, are relatively reliable in capturing overall movement; but certain basic problems of duplication with the sub-class indexes still cannot be totally ignored, as "In the Australian factory indexes published in this bulletin, the quantities of output of commodities for further processing in the same factory have been omitted wherever possible; but in general it has not been possible to identify output sold to other factories within the same sub-class, so that some duplication remains in the value of output, at current and therefore at constant prices",⁷⁴ and "As has been pointed out above there is a considerable measure of duplication in statistics of value of output".⁷⁵

In summing his reservations on the two issues mentioned, the Statistician considered that "Although the sub-class and class indexes are different in nature, in certain circumstances both can be thought of as indexes of value added at constant prices. Naturally, in view of the many assumptions involved, the imprecise concepts, and the limitations of data, they should not be interpreted as precise measures. In particular, the indexes, both for sub-classes and classes, have limitations in connection with productivity studies which attempt to express the quantity of output of production per unit of labour or other input."⁷⁶ This latter sentence suggests that the indexes must also have limitations in connection with other than broad movements in implicit price deflator studies; and while it would seem any YR index is closer in concept to YV than to YVO, there is insufficient conclusive evidence one way or the other. It is therefore suggested that implicit price deflator indexes should be constructed from each of the two,⁷⁷ and that the resulting indexes may or may not then yield significantly different results. And while the Tariff Board utilised the ratio YV/YR and Hancock used YVO/YR, both expressed some reservations in having to use YR: Hancock pointed out that "Both the choice of the period studied and the selection of industries for inclusion...were constrained by the availability of data for real output in manufacturing industries",⁷⁸ and that "Estimates of real output...covered most, but not all, industries. However, the estimates in all but a few instances account for less than 100 percent of the industries' outputs: whether they are sufficiently representative of the total is a matter of judgement";⁷⁹ and the Tariff Board that "The estimates for some industries are likely to be more reliable than for some others..."⁸⁰

Thus, knowing now that there is the possibility of obtaining two different sets of implicit price deflator series, both sets being of questionable quality, what can be said on the second major issue--that of classification?

(ii) Classification: Tariff Board/IAC or Statistician?

Although the Tariff Board and Hancock use different classifications, both claim to have covered approximately the whole of the manufacturing sector.

In the case of Hancock's research, it has already been pointed out that the coverage could not be complete because of the inadequate coverage of the volume of production index. So, it can be said that the Hancock classification conforms with the Statistician's Factory Classification of manufacturing industry in use up until 1967-68 but covers a maximum of forty industries⁸¹ due to problems of coverage associated with YR.

The Tariff Board, on the other hand, followed a classification of thirty-one industries for which "The sum...is equal to the activities covered by the Statistician's Factory Censuses (prior to 1968-69) with the exception of motor vehicle repairing, dry cleaning, tyre retreading, boot and shoe repairing, gas and electricity generation and distribution".⁸² For data prior to 1968-69, a copy of the key linking the two Classifications is provided in the Annual Report of the Tariff Board, 1969-70, Appendix 3, p. 29, Table 1, while for data since then a key linking the IAC Industry Classification with the ASIC Classification is available in the Annual Report of the Industries Assistance Commission, 1974-75, pp. 213-24. The major advantage of the Tariff Board/IAC Classifications is that they enable the manufacturing industry data obtained from the annual factory censuses to be linked with data collected by the Board in such important areas as tariff protection, concentration, overseas control, and financial performance. For this reason, the Tariff Board/IAC

Classifications will be preferred, as the four additional areas would seem potentially relevant to any comprehensive pricing behaviour study.

There is a further complicating factor to be dealt with before any conclusions on this set of data can be reached, though, and that is the question of the time periods over which the data may be available.

(iii) Time Periods for which Consistent Data are Available

Much of the commentary in sub-sections (i) and (ii) has related to data up to and including the 1967-68 fiscal year, the year when both the Tariff Board and Hancock analyses terminated. This is for the very good reason that 1968-69 was the first year for which manufacturing industry data was classified according to the ASIC, and more importantly still because "Data on manufacturing industries published by the Bureau for 1968-69 onwards cannot be readily compared with data for earlier years."⁸³ That there is no simple practical way of satisfactorily linking series classified according to the ASIC with series classified in accordance with the scheme used until 1967-68 was confirmed by some simple manipulations carried out by the author. The changes in definition of series, coverage and classification of data had been too extensive.⁸⁴

Because of this unfortunate but apparently insurmountable break in any series between 1967-68 and 1968-69, it is therefore necessary⁸⁵ to construct separate data bases for series terminating with 1967-68 and commencing in 1968-69.

With respect to any consistent data base for the manufacturing sector compiled from 1968-69 to date, neither time series nor significant cross-section analysis is yet possible. This is for two reasons, one minor and one major. The minor reason is that there was no Census of Manufacturing Establishments conducted for 1970-71.⁸⁶ This means that at the two digit and further

disaggregated levels, there are no estimates of gross product at current prices for that year and so none for implicit price deflators either. The major reason is that not even an imperfect suitable volume of production series is yet available. The Jackson Committee reported that "Mention should also be made of the lack of an official series of quantum indexes of factory production since 1967-68. Early attention to this deficiency is needed."⁸⁷ This major obstacle could well be soon overcome if the Jackson Committee were correct in reporting that "...the ABS did publish Indexes of Factory Production until 1967-68 and is expected to resume it in the foreseeable future on an ASIC basis",⁸⁸ When these Indexes are available, and depending on the quality of the series, some comprehensive cross-section analysis may be feasible. So, until then, one is restricted to very much more limited cross-section analysis at the two digit level only, utilising implicit price deflator observations (except for 1970-71) constructed from the data published on page 18 of Australian National Accounts: Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74, (ABS Ref. No. 7.12).

With respect to a consistent mining sector data base compiled from 1968-69 to date, the absence of suitable volume of production data is also the major problem. Censuses seem to have been conducted every year. Therefore, data at the Division level only are all those available.⁸⁹

With respect to the compilation of consistent data bases for the manufacturing and mining sectors for periods prior to 1968-69, this is not possible at all for the mining sector, thus effectively eliminating for comprehensive work at this stage the mining sector. For the manufacturing sector, although Hancock takes his data as far back as 1949-50⁹⁰ for

thirty-two of forty industries, it is not practical⁹¹ to extend the Tariff Board classification series back beyond 1955-56.

A further important deficiency that can be noted at this point, and which relates to both the prior- and post-1968-69 periods, is that "...no comparable and complete statistics are presently available for unemployment and vacancies by industry to indicate those industries which are experiencing excess labour demand or supply".⁹²

Hence, bearing in mind the factors covered under (i), (ii), and (iii) immediately above, this section can be concluded with the observation that the only practical possibility available at present is to undertake time series and/or cross-section analysis with manufacturing sector data classified according to the Tariff Board method for the thirteen years 1955-56 to 1967-68. The implicit price deflator series are clearly not ideal, and thirteen time series observations for the major series are a very small sample by any statistical standards, but some worthwhile tentative conclusions may be possible for both the Total Manufacturing Sector and for the thirty-one industry sub-divisions. Especially seeing that the Tariff Board did negligible published analysis on these data from a purely pricing point of view.

8. Summary and Conclusions

At the outset of this paper, it was pointed out that the data evaluation would relate to the field of pricing behaviour at the level of the sector, the industry or market, and the firm, rather than at the more macro-economic and expenditure based levels of aggregation represented in the RBA, RBF, and NIF models of the Australian economy. Additional information which would be relevant to nine basic empirical questions was also to be sought.

Now, it is possible to suggest that not only can the general viewpoint of the Crisp Committee that "There appear to be quite important deficiencies in the data presently available about movements in the prices of different goods. Published price indices at present available relate only to very broad categories of goods"⁹³ be agreed with, but also that they considerably underestimate the severity of the situation as far as in-depth quantitative research is concerned.

It has also been established that work on sectors other than manufacturing is not yet a practical proposition either with data prior to 1968-69 or with data from 1968-69.

Therefore, with respect to the manufacturing sector, it can be reported:

(i) With respect to data available now:⁹⁴

(a) Consistently classified implicit price deflator and other data are available on an annual basis for the thirteen-year time period 1955-56 to 1967-68 according to the Tariff Board's classification of thirty-one industries. This set of data would enable cross section or very small sample time series analysis, would extend the general non-econometric work done by the Tariff Board for its 1970-71 Annual Report into the specific area of pricing, and may enable some comparison of results with those obtained by Hancock [10] who used a somewhat different classification and did not take into account the four additional factors of degree of tariff protection, degree of sales concentration, degree of overseas control, and standard of financial performance. Clearly one additional aspect of this work would have to be an evaluation of whether the implicit price deflators used are sufficiently reliable;

(b) Consistently classified implicit gross product deflator data are available on an annual basis (except for the year 1970-71 in which there was no Census of Manufacturing Establishments conducted) for the five-year period 1968-69, 1969-70, 1971-72, 1972-73, for the twelve ASIC sub-division codes 21-22, 23 to 29, and 31 to 34. Because there are insufficient time series observations, and because the level of disaggregation seems at present restricted to the two digit level, neither time series nor cross section work with these data are at present a practical proposition;

(c) Consistently classified percentage change in actual price data, and other data, are available on a quarterly/semi-annual basis from 1970, from the Department of Industry and Commerce's "Quarterly Survey of Manufacturing Activity." An especially important attribute of these data is that they will enable the testing on a cross section basis for a number of possible market or excess demand influences on pricing decisions;

(d) Consistently classified percentage change series for actual prices, and other data, are able to be constructed from raw quarterly data available as far back as the June quarter of 1966 in the ACMA/Wales "Survey of Industrial Trends." Industries can be classified according to four categories of size (i.e., by number of employees), either eight or twelve categories of industry, and nine categories of product. As for (c) an important feature here will be the opportunity to test on both time series and cross section bases possible market or excess demand influences;

(ii) With respect to data becoming available in the future:

(a) When the ABS has realised its intention to develop and publish a set of wholesale price indexes relating to both net input and output prices for manufacturing industry classified according to major ASIC subdivisions and extended back to 1968-69, some substantial hypothesis testing work may be possible with respect to the determination of annual actual price levels. It is not clear at this stage how disaggregate these WPI data will be, and whether they will then need some degree of reclassification, but certainly until sufficient time series observations are available, only cross section analysis will be feasible;

(b) When the ABS has resumed publication of Indexes of Factory Production on an ASIC basis as from 1968-69, it should be possible to compute or have available annual implicit price deflator series at more than the two digit level of disaggregation referred to in (i)(b) above. Clearly in this case, too, only cross section analysis will be possible for a very considerable period of time, but it should be possible to use the data either in the presented ASIC classification form or in IAC classification form (so as to account for the influence of the additional characteristics of tariff protection, etc.); and depending on the concept of this volume of production index, the implicit deflator series⁹⁵ may enable compilation of either a value added deflator or (hopefully) an ex-factory selling value price deflator;

(iii) With respect to pricing data unlikely to be readily available in the foreseeable future, consistently classified data on import prices, export prices, and wholesale prices for sectors other than manufacturing currently seem to be minimum necessities for sound quantitative empirical research.

Footnotes

¹Leontief [13], p. 6.

²Report of the Committee on Integration of Data Systems [18], p. 67. See also pp. 3,4 of the Report for the implications of such incompatibility in pricing information on the actions and recommendations of the Prices Justification Tribunal, the Trade Practices Commission, and the Industries Assistance Commission.

³No mention will be made of the various quarterly seasonally adjusted and unadjusted actual and implicit deflator price indexes used in the various RBA, RBF, and NIF macroeconomic models of the Australian economy, as most of those price series relate directly to the national expenditure or production type bases of disaggregation used in the models, and there is no desire in this paper to overlap with or duplicate that work.

⁴Further details can be found in Chapter 1 of the Labour Report No. 58, 1973 (ABS Ref. No. 6.7).

⁵Ibid., p. 6.

⁶This present situation for Australia can also be seen in light of the recent work on U.S. data by Popkin [17], who has shown that components of the Consumer Price Index could be developed which related to wholesale price indexes arranged by stage-of-process. The possibility of undertaking a similar exercise for Australia has not been investigated thoroughly, but a preliminary appraisal of the wholesale price indexes in particular (see below) indicates this would not be an immediately practical proposition.

⁷ Further details are available in chapter 2 of the Labour Report, No. 58, 1973 (ABS Ref. No. 6.7), and in Wholesale Price Indexes, Price Indexes of Materials in Manufacturing Industry (ABS Ref. No. 9.13), April 1975, April 1976, and Supplement Monthly Series - July 1968 to June 1973.

⁸ See, for example, the re-weighting necessary in the studies for U.S. manufacturing industry by Eckstein and Wyss [6, p. 136] and by Earl [5, pp. 175-76], and for U.K. non-food manufacturing industry by Nordhaus and Godley [15, p. 874].

⁹ Except perhaps for the limited purpose of trying to relate it or some of its components to the Melbourne city components of the CPI.

¹⁰ Labour Report, No. 58, 1973 (ABS Ref. No. 6.7), p. 44.

¹¹ Ibid., p. 57.

¹² Ibid., p. 70.

¹³ Idem.

¹⁴ Wholesale Price Indexes, Price Indexes of Materials Used in Manufacturing Industry (ABS Ref. No. 9.13), April 1975, p. 1.

¹⁵ Ibid., p. 2.

¹⁶ Ibid., p. 1.

¹⁷ Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, p. 21.

¹⁸ These indexes are published monthly in the Statistical Bulletin, Reserve Bank of Australia.

¹⁹ A detailed description of some of these limitations can be found in Burgess [1], chapter four.

²⁰ See Export Price Index (ABS Ref. No.9.2).

²¹ For example, the Jackson Committee reports (p. 20) that "Manufacturing commodities are not identified."

²² Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, p. 11.

²³ Report of the Committee on Integration of Data Systems [18], p. 8; also p. 114.

²⁴ See Minerals and Mineral Products (ABS Ref. No. 10.19) and Australian Mineral Industry: Quarterly Review (Bureau of Mineral Resources).

²⁵ Minerals and Mineral Products (ABS Ref. No. 10.19), May 1975, p. 19. This has already been referred to in the section above on wholesale price indexes, and therefore contributes no new information.

²⁶ Survey questionnaires are sent to firms with about one quarter of manufacturing sector employees. The response rate can be as high as 85%, though not always the same firms reply.

²⁷ For example, it is possible that this Survey and the Department are being referred to by the Crisp Committee [18, pp. 8-9] in the following quote: "As a result of the separate development, in isolation, of many departmental statistics, the resulting data-systems are not well co-ordinated physically. The Committee has noted examples of multiple independent approaches to the same informants by different official collectors for similar or related data. For instance, many firms in the manufacturing sector have in recent years been asked for the same basic data about their operations by at least three different government departments or agencies, including the Bureau, within periods of twelve months or less. The Committee has noted also the essentially independent efforts of the various departmental producers of official statistics to produce and distribute the data they obtain."

²⁸ Survey questionnaires are sent to about 500 firms, selected not randomly, but with a view to obtaining a representative coverage of the manufacturing sector. These firms account for approximately 23% of total manufacturing employment. The response rate varies considerably (but is usually between 60% and 70%), as the delay between collection of data and presentation of results is required to be minimal. The basic aim is to obtain about 300 replies before the cut-off time for processing. Further details can be found in Kerr [12].

²⁹ The "Balance Statistic" (or Diffusion Index) method of Theil [21], and the "Carlson-Parkin Statistic" of Carlson and Parkin [2].

³⁰ Danes also provides a detailed explanation of the various other raw data series, and aggregate series prepared on consistent basis extending back to the March quarter of 1960.

³¹ Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, p. 23.

³² See Ackland, Richard, "Prices Tribunal plugs into Computer to examine Rises Claim," Australian Financial Review, 21 August 1974; also the Report of the Committee on Integration of Data Systems [18, p. 3 or p. 113] where the then Prime Minister wrote that "...we do not have available the type of detailed price information that will be required by bodies such as the Prices Justification Tribunal, the Trade Practices Commission and the Industries Assistance Commission. It would seem sensible to develop a price-information system which will help us to evaluate the effects which particular recommendations from each of these public advisory bodies are likely to have on price movements and profitability in related industries. If each of the bodies developed a separate information system on prices, we will have difficulty in relating and evaluating their recommendations. There is, moreover, no reason why a common system should not be developed to service not only these industries but the government and the community at large."

³³ Fels [7], p. 17, or Williams [22], pp. 3-4.

³⁴ Fels [7], p. 17. "The Tribunal has been established as a prices justification tribunal and not as a price-fixing authority. Its function under the Act is to decide whether a proposed price is justified, not to assess and prescribe what the price of a particular product would be."

³⁵ Ibid., p. 7.

³⁶ First Annual Report of the Prices Justification Tribunal, 1973-74. Norman [16, p. 2], however, would not seem to accept this fully, as he attempts to present a theoretical framework capturing the essence of the Tribunal's method of price-making.

³⁷ First Annual Report etc., p. 14.

³⁸ Ibid., Appendix 10.

³⁹ This Memorandum is reproduced in full in the First Annual Report etc., Appendix 11, and is summarised more briefly in Williams [22], pp. 18-19.

⁴⁰ Report by Prices Justification Tribunal, The Broken Hill Proprietary Company Limited and Australian Iron and Steel Company Limited, Matter No. N73/7, 10 October 1973, pp. 15-16.

⁴¹ Ibid., p. 16.

⁴² Ibid., p. 17.

⁴³ Idem

⁴⁴ Ibid., p. 22.

⁴⁵ Fels [7], p. 19.

⁴⁶Report by Prices Justification Tribunal, Australian Paper Manufacturers Limited and Cellulose Australia Limited, Matter No. N73/62, 24 October 1973, p.17.

⁴⁷Report by Prices Justification Tribunal, General Motors-Holden's Pty. Limited and General Motors-Holden's Sales Pty. Limited, Matter No. N73/770, 21 December 1973, p.17.

⁴⁸Ibid., p.17.

⁴⁹Report by Prices Justification Tribunal, The Broken Hill Proprietary Company Limited and Australian Iron and Steel Proprietary Company Limited, Matter No. N74/1637, 28 March 1974, p.45.

⁵⁰Ibid., p.49.

⁵¹Report by Prices Justification Tribunal, Arnotts Limited, Matter No. N74/2534, 13 September 1974, pp. 4-5.

⁵²Hogan [11], p. 5.

⁵³Norman [16], p. 35.

⁵⁴See, for example, Spencer [20] chapter nine (especially pp. 288-307) for discussion of pricing objectives cited in the 1958 Survey by the Brookings Institution and for discussion of major different pricing methods employed to try to achieve those objectives.

⁵⁵"Datec aids the Prices Tribunal," Australian Financial Review, 7 January 1975,

⁵⁶Report of the Committee on Integration of Data Systems [18], pp. 7-8. The extensions envisaged clearly include the construction, transport, and finance sectors (ibid., p. 67). See also Australian National Accounts: Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74 (ABS, Ref. No. 7.12), 24 November 1975, Preface.

⁵⁷Annual Report of the Industries Assistance Commission, 1974-75, footnote to second page of Preface.

⁵⁸Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, p. 27.

⁵⁹Annual Report of the Industries Assistance Commission, 1974-75, footnote to second page of Preface.

⁶⁰Report of the Committee on Integration of Data Systems [18], pp. 3-4, and similarly on pp. 113-16.

⁶¹Note that the Committee (p. 137) "...has not attempted to judge whether these deficiencies are serious or not; nor has it tried to assess whether they are, in fact, deficiencies which could, or should, be remedied."

⁶²Ibid., p. 140.

⁶³Again note that the Committee (p. 127) "...has identified the principal gaps in official statistics which were referred to it in submissions... In listing them the Committee deliberately eschewed any attempt to make judgements as to the feasibility of, or justification for, particular proposals for new statistics or to rank the requirements in order of importance."

⁶⁴Ibid., p. 130.

⁶⁵Report by Prices Justification Tribunal, Shell Australian Securities Limited and Related Companies, Matter No. N74/42, 3 May 1974, p. 13.

⁶⁶Ibid., pp. 22-23.

⁶⁷Ibid., p. 14.

⁶⁸Committee to Advise on Policies for Manufacturing Industry [3], Volume I: Report, p. 59.

⁶⁹Ibid., Volume II: Statistics, p. 10.

⁷⁰See Annual Report of the Tariff Board, 1970-71, p. 14 or Appendix 2, p. 45. Value of production is referred to (p. 11, fn. 6) as "...the value added to purchased materials and fuels in the production process. It is the return to labour and capital and services employed in each production process", and is calculated (Manufacturing Industry Bulletin, 1967-68, p. viii) "...by deducting from the value of factory output the value (at the factory) of the materials used, containers and packing, power, fuel, and light used, tools replaced, and materials used in repairs to plant (but not depreciation charges)...the value of production, and not the value of output, is used as a measure of activity in the industries as a whole."

⁷¹Hancock [10], p. 66. Value of output (Annual Report of the Tariff Board, 1970-71, p. 11, fn. 6), is "...the ex-factory selling value of products...is equal to the value of production plus the value of materials and fuels", or (Manufacturing Industry Bulletin, 1967-68, p. viii) "...the value of the goods manufactured or their value after passing through the particular process of manufacture and includes the amount received for repair work, work done on commission and receipts for other factory work. The basis of valuation of the output is the selling value of the finished articles at the factory, exclusive of all delivery costs and charges and excise duties, but inclusive of bounty and subsidy payments to the manufacturer".

⁷²Indexes of Factory Production in Australia, 1949-50 to 1967-68 (ABS Ref. No. 12.5), p. 4. Emphases the author's.

⁷³Ibid., pp. 7-8.

⁷⁴Ibid., p. 4.

⁷⁵Ibid., p. 7.

⁷⁶Ibid., pp. 4-5.

⁷⁷ In the case of the indexes constructed using YVO, further data will be required on the value of materials, capital inputs etc. before econometric work can be undertaken.

⁷⁸Hancock [10], p. 56.

⁷⁹Ibid., p. 66.

⁸⁰Annual Report of the Tariff Board, 1970-71, p. 14. It is further pointed out (Appendix 2, p. 40) that "For the estimation of volume of production, implicit price indexes were available for 87 of the Statistician's factory sub-classes which accounted for 78 percent of value of production in 1959-60; these price indexes were used to revalue output at constant prices. For other sub-classes, the implicit price index for the relevant factory class was assumed to apply to the component sub-classes."

⁸¹Hancock [10], p. 67.

⁸²Annual Report of the Tariff Board, 1970-71, p. 7, fn. 1.

⁸³Annual Report of the Industries Assistance Commission, 1974-75, p. 3, fn. 2. A similar comment appears on p. 23 of Australian National Accounts: Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74 (ABS Ref. No. 7.12).

⁸⁴Some details on the extent of these changes can be found in Manufacturing Establishments - Details of Operations, 1969-70 (ABS Ref. No. 12.29), pp. 3-6.

⁸⁵Note, however, the minor exception at the ASIC Division level, where the estimates presented in Table 3 of Australian National Accounts: Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74 (ABS Ref. No. 7.12), would enable construction of implicit price deflator series for those years. This avenue is neither further pursued nor recommended for further work, both because the level of disaggregation is insufficient and because it is unlikely that the appropriate series for all other variables required for econometric work could be constructed as well.

⁸⁶Ibid., p. 18.

⁸⁷Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, pp. 10-11.

⁸⁸Ibid., p. 23.

⁸⁹Table 3, Australian National Accounts: Gross Product by Industry at Current and Constant Prices 1962-63 to 1973-74 (ABS Ref. No. 7.12).

⁹⁰Hancock [10], pp. 56, 67, and 68.

⁹¹This is due solely to the problems involved in attempting to produce an appropriately reclassified volume of production series prior to 1955-56, as some of the disaggregated indexes are unpublished, and of those indexes published, too little further information on sub-classes is given. It is presumably for this reason that the Tariff Board Indexes published in their 1970-71 Annual Report commence only in 1955-56.

⁹²Committee to Advise on Policies for Manufacturing Industry [3], Volume II: Statistics, p. 11.

⁹³Report of the Committee on Integration of Data Systems [18], p. 3.

⁹⁴For preliminary results from research using (a), (c), and (d) see Hall [8], Saunders [19], and Hall [9], respectively.

⁹⁵It is already known, from Manufacturing Establishments - Details of Operations, 1969-70 (ABS Ref. No. 12.29), for the numerator series that (p. 5) the term "value added" replaces the ASIC classification as from 1968-69, the term "value added" replaces the previously used term "value of production", that similarly the value of "turnover" is collected to replace the previously used "value of output", and that (p. 6) "Even though the concept of value added is similar to value of production, direct comparison of 1967-68 and subsequent figures will not be possible... ."

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