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Professor Cameron is at present in charge of a large research project into the structure of Australian industry, commenced in 1953. The first stage of the enquiry, which should be completed in 1956/7, is concerned with the compilation of input-output tables on lines already evolved in overseas countries. In this article Associate Professor Cameron has prepared a brief outline of this work, and its great significance for the business community and for the better understanding of economic processes.

Planning for Future Markets

By

Associate Professor Burgess Cameron

In Australia's rapidly diversifying economy, the problem of forecasting markets is likely to grow in importance. The businessman's markets are obviously affected by our population growth and by technical developments which are raising living standards, altering relative commodity prices and introducing new products.

Looking at the matter more closely, the individual businessman's market can be divided into two parts. First, there are his sales to **final consumers** —his "direct" market. Second, there are his sales to **other industries**— which may properly be called his "indirect" or "derived" market since these sales derive from the fact that the other industries themselves sell to final consumers (or to yet other industries who sell to consumers). Evaluating the **direct market** involves the study of consumer's tastes—a study which has been pioneered at Cambridge University where statisticians have been investigating consumers' tastes. Investigation of the indirect or **derived market** has been pioneered at Harvard University and it is this work, now being done in Australia at Canberra University College, which is reviewed here.

The significance of the derived market can be appreciated by asking the businessman one question: How far is the market for the output of your industry dependent upon final consumers' demand for the products of **other** industries? To many businessmen this question is of equal, if not greater, importance than the question of forecasting his direct market among consumers. Iron and steel, for example, are not bought by householders—but householders do demand cars, canned food, metal furniture, refrigerators and other household equipment. The Harvard investigators found that this consumer demand accounted for 33% of United States iron and steel production, while exports accounted for a further 17%—leaving only 50% to satisfy the more obvious demands by industry (and government) for machinery, vehicles and construction.

The investigation into the structure of Australian industry will provide an answer to the query posed at the start of the previous paragraph. The method used in the investigation is briefly as follows: A list has been drawn up of all commodities (or closely related commodity groups)

produced in the economy. This list necessarily runs into hundreds. Consider now just one commodity—whether it be milk or woollen cloth or railway services. From published statistics, and with the aid of representatives of the producing industry, an estimate can be made of the sales of that commodity **to every other industry** in Australia (as well as of sales to consumers, government and exports). If allowance is made for changes in stocks, these sales represent "inputs" of each purchasing industry, e.g. we will have estimates of the input of milk into: butter and cheese factories, ice cream works, bakeries, and so on.

If such a detailed estimate is made of the markets of **each** commodity in our original list, the results can be set out in a table looking rather like a crossword puzzle. It is the assembly of this table which is the immediate task of the Australian investigation. In the table each commodity is allotted a row and each industry allotted a column. Thus it is possible to show the market for a commodity by a series of entries, along its row, in the column of each purchasing industry (as well as in the additional columns allotted to household consumption, government and exports). As this shows how the output of the commodity becomes inputs into other industries, the table is briefly described as an **input-output table.** Inasmuch as this table sets out, clearly and quantitatively, the dependence of each industry upon the products of other industries, there is an obvious sense in which it describes the structure of the economy at any given time.

The input-output table can be used to answer the question we posed previously to the businessman: How far does your market depend on consumers' demand for the products of **other** industries? Thus the Harvard researchers, arranging United States industries for convenience in 200 groups, and assuming that an industry increases its inputs proportionately to its rate of production, calculated the answer to our question for each industry. The nature of the results may be indicated by considering two industries chosen at random from the United States tabulations.

Firstly, consider the derived demand for the glass industry. It was found that in 1947, $1 million spent on the final product of any industry listed in Table 1 implied a demand for glass of the amount indicated. These figures, of course, show the average rate of derived demand—although for brevity Table 1 lists only those industries causing a derived demand at the rate of more than $20,000.

TABLE 1

Final demand of $1m. for the output of an industry listed implies a derived demand for glass of:

	$'000
Canning, preserving	25
Alcoholic beverages	46
Partitions, screens	29
Drugs, medicines	35
Lighting fixtures	46
Electric lamps	123
Tubes (radio)	52
Optical & photographic equipment	27

Secondly, analysis of the derived demand for textile mills (spinning, weaving and dyeing) showed a lengthy list (see Table 2) of industries in respect of which $1 million of final demand for their products implied a demand for the output of textile mills of more than $20,000. (The need for brevity in this summary will be appreciated inasmuch as if the rate of derived demand were ex-

tended down to $10,000, another 21 industries would be listed in Table 2.).

TABLE 2

Final demand of $1m. for the output of an industry listed implies a derived demand for textile mill products of:

	$'000
Grain mill products	24
Special textile products	167
Jute, linen, cordage	138
Canvas products	505
Apparel	369
House furnishing	582
Wood furniture	71
Metal furniture	115
Partitions, screens	73
Tyres, tubes	246
Miscellaneous rubber products	113
Other leather products	60
Footwear	33
Abrasive products	117
Asbestos products	32
Transformers	22
Motor vehicles	34
Truck trailers	33
Automobile trailers	24
Medical, dental equipment	128
Musical instruments	21
Toys	26
Plastic products	93
Miscellaneous manufactures	26

Information of the type shown in these tables provides an obvious basis for the analysis of future markets for glass or textiles. It is worth emphasising that these figures include the furthest ramifications of derived demand—for the demand for a commodity such as public transport or electricity may only involve a derived demand for textiles at the third, fourth or fifth remove. It is the lack of precisely the type of information contained in these tables which has in the past hampered the established techniques of market research.

Input-output tables have many uses aside from market research. Indeed in the United States the major stimulus to this work has come from defence considerations—since in time of war the table can be used as a device to programme demands upon industry for munitions and supplies and thus to avoid bottlenecks. But from the viewpoint of the businessman, the input-output table is especially significant. For by the basically simple procedure of collecting in a single table information on individual commodity markets, the effect of changes in demand for the products of other industries on the demand for his own products can be ascertained —and his market forecasts made with greater confidence.

However while the assembly of an input-output table is conceptually simple, the practical difficulties are great. In the United States a large organisation was established to cope with the problems arising from gaps in published information and lack of consistency in statistics already available. The Australian project of assembling an input-output table for the census year 1947 is, by comparison, Operation Shoestring. That the project promises well is largely because of the generous response by both private and public organisations to our requests for co-operation in assembling information.