

**New Zealand System of National Accounts**

***Inter-Industry Study 1996***

***Interim Release of Tables***

**126 Industries**

*Released in August 2001 by*  
National Accounts Division  
Statistics New Zealand  
Te Tari Tatau  
Christchurch, New  
Zealand

---

# Contents

---

<b>Introduction</b> .....	<b>5</b>
<b>Money flow and product flow tables</b> .....	<b>7</b>
<b>Using inter-industry tables</b> .....	<b>9</b>
Table 1: Supply of products in basic prices. ....	9
Table 2: Use of products in basic prices. ....	11
Table 3: Imports into industries and categories of final demand in basic prices. ....	12
Table 4: Inter-industry transactions in basic prices. ....	13
Table 5: Industry by industry total requirements (direct & indirect) per unit of final demand.....	14
Table 6: Ultimate disposition of the output of industries. ....	15
Table 7: Cumulated primary input coefficients of industries. ....	16
Table 8: Cumulated primary input coefficients of categories of final demand.....	17
Table 9: Cumulated import coefficients of industries and categories of final demand.....	18
<b>Inter-industry tables 1996</b>	
Table 1: Supply of products in basic prices.	
Table 2: Use of products in basic prices.	
Table 3: Imports into industries and categories of final demand in basic prices.	
Table 4: Inter-Industry transactions in basic prices.	
Table 5: Industry by industry total requirements (direct & indirect) per unit of final demand.	
Table 6: Ultimate disposition of the output of industries.	
Table 7: Cumulated primary input coefficients of industries.	
Table 8: Cumulated primary input coefficients of categories of final demand.	
Table 9: Cumulated import coefficients of industries and categories of final demand	
<b>Commodity and industry concordances</b>	
Commodity mapping in the Inter-industry Study 1996	
Industry mapping in the Inter-industry Study 1996	



# Introduction

---

This document is an interim release of the Inter-Industry Study 1996 tables, comprising:

- the full set of tables directly available from the study at a 126 industry level of detail
- a description of each table and examples of how to interpret the table
- a concordance between the industry classification used in the study and the Australian and New Zealand Standard Industrial Classification
- a concordance between the commodity classification used in the study and the Australian and New Zealand Standard Commodity Classification
- an explanation of the differences between the supply and use tables, and the other tables.

A full publication will be produced shortly. It will contain all the above, along with additional text explaining the concepts, key sources and methods used, and the relationship of the tables to the New Zealand System of National Accounts time series. Note that the enclosed tables are final; however, the explanatory text may change during editing for the final publication.

For further information on statistics in this report contact Barry Voice of the National Accounts Division:  
Email: [national\\_accounts@stats.govt.nz](mailto:national_accounts@stats.govt.nz)  
Phone: 03 374 8841



## Money flow and product flow tables

---

The supply and use tables show transactions on the same basis as those recorded in business financial accounts. These accounts are collected via the Annual Enterprise Survey, which in turn is the principal data source for the inter-industry study. The business units surveyed are not homogeneous in what they produce, often producing a range of goods and services in addition to those that are characteristic of the industries they are classified to - that is 'secondary production'. Transactions in supply and use tables are observable 'real world' flows. They make useful statements about the economic flows in the New Zealand economy as shown in business accounts, ie on a 'money flow' basis. They are conceptually consistent with the other New Zealand System of National Accounts tables.

Tables produced on the money flow basis do not necessarily give the most appropriate account of the relationship between inputs and outputs of goods and services and the production processes used, because of the problem of secondary production. Therefore, where practical, the accounts of industries which have significant amounts of secondary production are adjusted, to remove this production and reclassify it to the industry where that production is characteristic. These 'product flow' tables form the basis of the transactions table and the later tables in this report.

There are two main types of adjustment made:

- Contract manufacturing, where, typically, a wholesale industry purchases raw materials, has them processed on a fee or commission basis, and then sells the finished product. The secondary production adjustments move the purchase and use of the raw materials, and sales of the finished product, from wholesale trade to the appropriate manufacturing industry, and eliminates the processing fee. These adjustments involve reclassifying actual transactions so that the tables record the physical flow of goods. Hence these tables are termed "product flow" tables.
- Significant retail trade activities of non-margin industries are reclassified to retail trade.

An example of a contract manufacturing adjustment is that made to the wholesale trade industry which includes the oil companies. This wholesale trade industry purchases crude oil, pays a manufacturing fee to have it refined by the petroleum refinery, then distributes and sells the refined product. Money flow transactions show the wholesale trade industry producing petrol when it is physically and characteristically done by the refinery. In the product flow tables the wholesale industry has had its purchases of crude oil transferred to the inputs of the refinery. The sales of petrol have been transferred from the wholesaler to the refinery too. The manufacturing fee paid by the wholesaler and received by the refinery is removed. The petroleum wholesaler is then shown to purchase refined petrol from the refinery for resale. The margin that becomes part of the adjusted petroleum wholesaler's output is spread over the users of petrol. In summary, we have adjusted two industries' production accounts to show production where it physically occurs.

Other activities where product flow adjustments for contract manufacturing contract were made are aluminium smelting, vehicle assembly and clothing manufacture. The main instance of secondary adjustment for margin activities is in the accommodation, restaurants and bars industry, where the margin activity has been shifted to the retail industries.

*Important note:*

The contract manufacturing adjustments, which put transactions on a product flow basis, have produced differences between the total outputs (inputs) as presented in the supply (use) tables and total outputs (inputs) in the inter-industry transactions table (ie table 4), and the other derived tables. Not only are the consumption expenditures, primary inputs and outputs of some individual industries different, but so is total gross output in the system. This is because contract manufacturing fees for the industries listed below have been removed as described in the petroleum example above. The difference is summarised below:

Total output in basic prices as per supply and use tables

= \$214,747m

less contract manufacturing fees for aluminium refining, petroleum refining, motor vehicle assembly, clothing manufacturing:

= \$585m

= \$214,162m as per total output in the inter-industry transactions table.

Also notice that 'total use in basic prices' and 'taxes on products' for individual industries show slight variation between the use and inter-industry transactions tables, but 'total use in purchasers' prices' is the same. This is the result of the contract manufacturing adjustments on petroleum wholesaling that have increased the wholesale margin on the use of petrol, while maintaining purchasers' prices. Producers' prices for petrol have therefore decreased and this has reallocated the petroleum tax among users depending on the incidence of the margins.

## Using inter-industry tables

---

**Table 1: Supply of products in basic prices.**

The table shows the supply of products by industry in basic prices, on a money-flow basis. It also reconciles total supply by product in basic prices with purchasers' prices by adding taxes on products and margins on products. The total supply of margins (row 220, column 213) is zero as the wholesale and retail margin commodities recorded in basic prices (rows 152 & 153, column 213) are removed and allocated to products in purchasers' prices.

Each column shows the production of products by a particular industry. Each row shows the production of a product by industries which produce it. The industry columns are sub-divided between market industries and non-market industries. Imports are also shown by products as a source of supply. Total supply of each industry is analysed according to whether the output was:

- Market, ie, output sold at economically significant prices or otherwise disposed of on the market.
- Own final use, ie, output retained for own use by the owners of the enterprises in which they are produced. Own account capital formation, the imputed rent of owner occupied dwellings, owner-builders' construction work and the output of private households with employed persons are examples.
- Other non-market, ie, output consisting of goods and services produced by government or non-profit institutions serving households for free or at prices that are not economically significant. Such output may be produced for two reasons:
  - (a) It may be technically impossible to charge individuals for collective services eg defence
  - (b) Goods and services are not charged for as a matter of social or economic policy eg health services.

These outputs are classified as 'services for own' use in the accounts of these producers.

Note that direct purchases abroad by residents (row 210, column 127) includes all expenditure by New Zealanders overseas for personal or business purposes. The supply of direct purchases abroad by residents is a component of imports and is shown as a single product. The use table shows the industries and final use that have made the direct purchases abroad.

Input-output tables use a "cost insurance and freight" (cif) valuation of imports as this is the valuation at which purchasers record their purchases of imports, consistent with the basic value of domestically produced goods. A global adjustment (rows 221, 222) adjusts imports from this cif basis to a total value consistent with the SNA 93 and the New Zealand System of National Accounts treatment of a "free on board" (fob) valuation of imports. The deduction of \$224m (row 221, column 127) represents the resident freight and insurance implicit in the cif valuation of imports, but is a resident to resident transaction that is not included in imports in SNA93. Note that exports are also reduced by \$224m in the use table (row 221, column 128). Under SNA68 resident freight and insurance on imports was included as an exported service and balanced with the resident freight and insurance debits implicit in the cif valuation of imported goods.

Examples from table 1.

1. The bars, clubs, cafes and restaurants industry produces \$995m meal services (row 156, column 78M) and \$554m beverage services (row 158, column 78M).

2. In basic prices, New Zealand industries produce \$730m of domestic appliances (row 122, total industry column) while \$247m of this commodity is imported (row 122, column 127).

## Table 2: Use of products in basic prices.

The table shows the use of products by industry and final demand category, in basic prices, on a money-flow basis. Each column shows products and value added (primary inputs) used by each industry. Each row shows the inputs of a commodity or item of value added to industries which use it. The industry columns showing intermediate consumption are sub-divided between market industries and non-market industries as per table 1. Other columns show use by product of final demands:

- exports
- final consumption expenditure by households
- private non-profit institutions serving households
- final consumption expenditure by central and local government
- gross fixed capital formation
- changes in inventories

Total intermediate consumption of each industry in basic prices is reconciled to purchasers' prices in rows 211 to 213. Each industry's value added, by component, is then added to intermediate consumption to give the total value of gross output by industry. This total output matches the total supply by industry as in table 1.

Examples from table 2.

1. The bakery, sugar and confectionery manufacturing industry consumed \$170m of grain products (row 54, column 24M) and \$283m of sugar (row 58, column 24M).
2. The ship and boat building industry paid \$106m in salaries, wages and allowances to its employees, either in cash or in kind (row 215, column 51M).
3. New Zealand exported \$979m of pulp, paper and paperboard to the rest of the world (row 83, column 128).
4. Households spent \$54,420m in purchasers' prices (row 213, column 129). This comprised expenditure in basic prices of \$48,537m (row 211, column 129) and \$5,883m in taxes on products (row 212, column 129).

### **Table 3: Imports into industries and categories of final demand in basic prices.**

This table details the imported products used by industries and final demand. It shows where the supply of imported goods and services (column 127 in the supply table) are used in intermediate consumption, final demand and gross capital formation.

Note that only products with non-zeros are shown in this table. The market / non-market split of industries is removed.

Examples from table 3.

1. The dairy cattle farming industry imported \$61m of pharmaceutical products (row 95, column 7).
2. Households spend \$1,315m on the direct purchase of goods and services abroad (row 210, column 129).
3. \$4,503m of New Zealand's gross fixed capital formation is imported (row 181, column 133). \$541m of this are computers and parts (row 124, column 133).

#### **Table 4: Inter-industry transactions in basic prices.**

The interdependence of industries is shown in terms of how much each industry buys from and sells to every other industry. The market / non-market split of industries is removed.

This table traces the flows to where the production physically occurs. Contracted aluminium production, petroleum refining, vehicle assembly, and clothing manufacture have their activities moved from the wholesale industries (as they were in the supply and use tables) to the manufacturing industries. The accommodation, restaurants and bars industry has had its output of margin and corresponding inputs moved to the retail trade industry.

There are three parts to this table:

- Rows 1 to 127 show the source of products used by industries (columns 1 to 126) in intermediate consumption. Note that imports are shown in row 127 as a direct source of supply of products.
- Rows 214 to 219 show value added of each industry, while row 220 shows each industry's total gross output. These rows correspond to those in table 2, but there are differences due to the secondary production adjustments.
- Columns 129 to 134 analyse final demand aggregates according to which industries supply that final demand.

#### Examples from table 4.

1. The non-building construction industry buys \$45m worth of products from other mining and quarrying (row 16, column 68) and \$122m worth of imported goods and services (row 127, column 68).
2. Central government administration purchased \$62m of goods and services from the legal services industry (row 99, column 106).
3. Households purchased \$476m of goods and services from the lotteries, casinos and other gambling industry (row 123, column 129).
4. The sea food processing industry exports \$1,066m of its output (row 25, column 128).

**Table 5: Industry by industry total requirements (direct & indirect) per unit of final demand.**

Table 5 shows how much extra output is required to be produced by every industry if a particular industry is to produce more of its own output. However, each of these contributing industries would need inputs into their own production process, in turn produced by other industries. These are called indirect requirements. As an external source of products, imports are removed from an analysis of the interdependence of domestic industries. The import requirements of these industries and final demand is analysed in tables 7, 8 and 9.

Table 5 takes into account both direct and indirect requirements and is sometimes referred to as the inverse matrix. They are read by columns and expressed as coefficients. Each cell in the table describes the change in requirements from the source industry (rows) to meet a one unit change in production for final demand by the producing industry (columns).

In order for an industry in a column to produce one extra unit of output for final use (eg household consumption, exports) extra output is required from each industry in the rows in the proportions shown. The values at the diagonal intersection of the rows and columns are all greater than one, since in order for an industry to increase its output by one more unit directly for final use, it must actually increase its output by more than one, the remainder being required by other industries in order for them to produce their contribution.

**Examples from table 5**

1. In order for the forestry industry to produce \$1m extra output for exports, \$145,000 extra output will be required from the road freight transport industry (row 79, column 10). [ $\$1,000,000 \times 0.145$ ]
2. If the medical, dental and other health services industry is to increase its output by \$1m for household consumption then it must in fact increase its own production by \$1.063m (row 115, column 115). [ $\$1,000,000 \times 1.063$ ]
3. If an upturn in the world demand for kiwifruit were to increase kiwifruit exports by \$100m, then \$7.3m more output would be required from the services to agriculture, hunting and trapping industry (row 9, column 3). [ $\$100,000,000 \times 0.073$ ]

### **Table 6: Ultimate disposition of the output of industries.**

This table shows the final demand categories that each industry's output ultimately goes to. The output may go directly to final demand, eg exports, or may go indirectly after processing by other industries. Nevertheless, total output by New Zealand industries (table 4, row 144, total industry column) must eventually be consumed by households, government, non-profit institutions serving households, or add to gross fixed capital formation or inventories, or be exported. Flows in columns 128 to 134 of the Ultimate disposition of the output of industries will exceed those equivalent columns in the Inter-Industry transactions table (table 4 columns 128 to 134) by purchases by industries for further processing.

The table is useful for determining an industry's overall contribution to the economy's export receipts and other final demands, both directly and indirectly.

#### Examples from table 6

1. Of the dairy cattle farming industry's output of \$3,590m, 63% is ultimately exported (row 7, column 128). [ $\$2,273\text{m}/\$3,590\text{m} \times 100$ ]
2. Of the non-residential building construction industry's output of \$2,052m, 80% is ultimately used for gross fixed capital formation (row 67, column 133). [ $\$1,636\text{m}/\$2,052\text{m} \times 100$ ]

### Table 7: Cumulated primary input coefficients of industries.

The columns of this table show in unit terms the allocation of each industry's total value added and imports to the items of value added (primary inputs) and imports. It includes the direct payments by an industry for salaries and wages, imports etc, but also takes into account the value added items and import costs incurred by other industries which produce commodities used by that industry, ie, indirect payments.

These tables can also be read by rows to show the effect on each industry of an economy wide change in one of the primary input categories (for example, compensation of employees), or say a change in imports due to a depreciation of the New Zealand dollar.

#### Examples from table 7

1. Wages increase by 3% across the whole economy. Since direct and indirect salary and wage costs form 78% of the total costs of the primary and secondary education industry (row 215, column 111), it follows that the total input costs of this industry will ultimately rise by 2.3%.  $[0.03 \times 0.78 \times 100]$

2. If the motion picture, radio and TV services industry is to increase its output by 10%, then import costs will increase by 0.1% for the whole economy:

$$\frac{[0.10 \times 0.276](\text{table 7, row 127, column 120}) \times \$1,336\text{m} (\text{table 4, row 120, total economy column})}{\$26,641\text{m} (\text{table 4, row 127, total economy column})}$$

**Table 8: Cumulated primary input coefficients of categories of final demand.**

This table is an extension of table 7. The columns of this table show in unit terms the allocation of items value added (primary inputs) and imports to final demand categories. It is calculated by taking into account all the primary input and import costs incurred, both directly and indirectly, by all industries and the ultimate disposition of commodities produced. The table can be used, for example, to show the import content of exports or capital formation.

Example from table 8

1. If import prices rise by 5% economy wide, total export costs for the whole economy will rise by 1%. [ $0.05 \times 0.200$  (row 127, column 128)  $\times 100$ ]

### Table 9: Cumulated import coefficients of industries and categories of final demand

This table is an expansion of the imports row in tables 7 and 8 and show imports itemised according to the products listed in table 3. For example, the total import component of gross fixed capital formation (table 8, row 127, column 133) is analysed by imported products in this table (column 133). The table shows the imported products used, directly and indirectly, in gross fixed capital formation.

#### Example from table 9

An increase of 10% in wholesale trade services will require a 1.6% increase in the imports of computer services.

$$\frac{[0.10 \times 0.002 \text{ (table 9, row 176, column 75)} \times \$14,735\text{m (table 4 row 220, column 75)}]}{\$187\text{m (table 3 row 176, column 127)}}$$