



Microeconomic Reforms and Australian Productivity: Exploring the Links

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1 Whitegoods

by Wiggins Price and Associates Pty Ltd¹

1.1 Introduction

Microeconomic reform (MER) is an important part of the process of removing barriers to achieving more competitive markets for goods and services. Competitive markets force suppliers to respond quickly to meet consumer needs, to keep costs down and to develop new and improved products. Competition is essential to improving the productivity performance of all industries and to ensuring that the benefits are equitably shared between suppliers and consumers.

The process by which industries are able to adapt to, and take advantage of, more competitive markets is instructive to an understanding of how MER impacts on management decisions. For example, managers may be able to negotiate more competitive prices for telecommunications, water, electricity, financial and other services. A firm's operating efficiency can also be improved indirectly through better delivery of government services and more cost effective and efficient public sector management, transport reforms, and improved education and training. Individual firms and industries can capture these generally available externalities from MER even with passive decision making.

But some forms of MER can challenge the most fundamental aspects of a firm's operation and therefore require a more strategic approach by management. These include tariff reductions, labour market reforms and other regulatory changes which either force, or allow, re-organisation of production, marketing, product and input sourcing, product design, cost structures and relative investment in land, labour and capital.

¹ The Wiggins Price and Associates report was received in July 1998. The Commission has rearranged some material and introduced minor editorial changes to present the report in a way consistent with other case studies. Responsibility for the material rests with Wiggins Price and Associates. Copies of the original report are available upon request from the Commission. Attachments to the report are available on the Commission's website at www.pc.gov.au.

Tariff protection is now generally recognised as being a drag on the productive capability of firms and the economy. By cushioning local firms from the increased commercial pressure of international competition, incentives for cost containment and innovation are reduced. Lower trade barriers also mean consumers have a wider choice in the prices and quality of goods and services available.

Universal acceptance of this view was not always the case however. During much of the 1970s and 1980s, lobbyists for the manufacturing sector, the one with apparently most to lose from reductions in barrier protection, were sceptical of the gains from trade reform. Dramatic declines in the size and contribution of manufacturing to Australia's economy were often predicted. Most fears related to those industries with the highest relative rates of tariff protection. Whitegoods was one of those industries.

Hindsight has proved such fears to be unwarranted. As the Industry Commission pointed out in its *Annual Report 1996-97* (p. 14):

The level of manufacturing output is, in fact, more than twice today in real terms as it was three decades ago. But over the same period, manufacturing's share of national output fell from 26 per cent to 14 per cent, because other sectors - particularly services - have been growing faster.

The Commission went on to note that a relative decline in manufacturing activity is a common feature of economic progress in developed nations.

But manufacturing aggregates mask what has happened at the industry and firm level in response to trade related MER reforms, especially for industries such as whitegoods whose assistance levels started from such a high base 20 years ago. Whitegoods has moved from a tariff and quota protected market position with limited international exposure in the late 1970s to virtually open competition by the mid-1990s.

Rather than realising the fears of those opposing trade reform, the Australian whitegoods industry would seem to be a model example of the longer term benefits of such reform. Over the last 20 years, the local industry's turnover has grown from around \$1.0 billion to more than \$2.2 billion; exports have increased from under 3 per cent of turnover to around 8 per cent. The number of local manufacturers has more than halved. Production efficiencies have reduced the workforce by almost half with consequent gains in productivity. Consumers have benefited by having a wider choice of products and models at world competitive prices.

² The whitegoods industry is defined as the manufacturing of domestic electrical refrigerators, freezers, washing machines, rotary clothes dryers, dishwashers and electrical and non-electrical cookers.

The nature of the whitegoods market itself could hardly be considered to be a catalyst of change. It is a mature market characterised by long product life and, with some exceptions, household penetration at or near 100 per cent. Technological change in product design has not been fast and the customer base has remained relatively stable. Replacement purchases are a major explanatory factor of demand.

Yet despite these static market characteristics, the complexion of the industry has altered considerably over the last decade or so. Given the nature of the market, it would seem far more likely that the impetus for change resulted from exogenous market factors rather than endogenous factors.

By far the most significant of these outside influences has been increased competition due essentially to trade and other MER related reforms. Structural change has occurred as a result of strategic management decisions in response to this increased competitive pressure. Local manufacturers have sought to shore up their market position by improving efficiency and developing new markets. New importers have taken advantage of the more open market by establishing a foothold in the local market.

While trade related and industry specific MER provided the impetus for this transition (along with other MER such as foreign exchange and financial market deregulation), it is the collective strategic response of firms in the industry, which determined its outcome. An understanding of the Australian whitegoods industry's successful journey from a highly protected activity to a world competitive one is therefore instructive to an understanding of the process by which MER can work through an industry.

In this report, the relationship between the observed process of change in the Australian whitegoods industry and MER is explored over the period from the late 1970s to the mid-1990s. Such a long term study is necessary for two reasons. First, it covers the period before and after substantial MER — chiefly the reductions in tariff protection over the 1980s and labour market reform in the 1990s. Second, it allows for trends to be established which are uncorrupted by shorter term market influences such as the home building cycle and general movements in the economic cycle.

Section 2 of this report provides a snapshot of the Australian whitegoods industry during the late 1970s when the last Industries Assistance Commission inquiry into whitegoods was conducted (1978). Section 3 describes the major forms of microeconomic reform and other influences which impacted on the industry throughout the period under review. Section 4 describes the pressures for change; the strategies adopted by the industry to maintain its competitive position; and analyses the productivity outcomes arising from those strategies. Finally, section 5

draws conclusions on what can be learned from the whitegoods case study of the relationship between MER and its influence on strategic decision making at the industry and firm level.

1.2 Australia's whitegoods industry prior to reform

This section provides a snapshot of the Australian whitegoods industry of the late 1970s — before the impact of tariff reductions and labour market reform MER. The description draws heavily on two government reports: Industries Assistance Commission (IAC) report (1978) and Bureau of Industry Economics (BIE) report (1983). It also relies extensively on data from the Australian Bureau of Statistics (ABS) for ASIC 3353 — Refrigerators and Household Appliances.

Both the IAC and BIE reports raised questions about the industry's ability to compete long term. The particular areas of concern included slow demand growth and market saturation; increasing costs of wages, materials and components; lack of economies of size; fragmentation; and failure to implement best practice technology.

Although there had been considerable rationalisation of the industry's structure over the 1970's, the industry was not in particularly good shape at the end of that decade. The Government's decision on the IAC's 1978 report, which set in train the process of tariff reductions for Australia's whitegoods industry, put the industry at the crossroads.

Table 1.1 shows the key structural information on the Australian whitegoods industry over the period 1970 to 1978 and compares its performance with that of the manufacturing sector generally.

The full extent of the relative malaise facing the industry at that time is shown in the trends of the relative performance ratios.

Table 1.1 Trends in the Australian whitegoods industry, 1970 to 1978

| Year | Turnover | Sales/ trans | Value added | Employ- ment | Wages/ sales | Purchase | Invest- ment | Imports | Exports ^a |
|------|----------|-----------------|----------------|-----------------|-----------------|----------|-----------------|---------|----------------------|
| | \$'000 | \$'000 | \$'000 | No | \$'000 | \$'000 | \$'000 | \$'000 | \$'000 |
| 1970 | 409 065 | 380 148 | 169 288 | 27 368 | 90 791 | 247 564 | 11 526 | 3653 | 10 763 |
| 1971 | | | | | | | | | |
| 1972 | 433 012 | 393 581 | 185 923 | 26 110 | 103 684 | 257 629 | 8 341 | 53 621 | 15 557 |
| 1973 | 484 801 | 442 771 | 199 907 | 26 669 | 115 098 | 281 622 | 9 329 | 64 621 | 18 988 |
| 1974 | 608 335 | 364 942 | 265 725 | 30 053 | 151 739 | 377 730 | 14 395 | 116 468 | 20 350 |
| 1975 | 654 582 | 606 723 | 295 452 | 27 429 | 173 975 | 399 180 | 18 383 | 186 013 | 26 633 |
| 1976 | 759 357 | 701 809 | 326 878 | 27 123 | 200 321 | 436 014 | 15 840 | 173 118 | 24 234 |
| 1977 | 791 629 | 734 456 | 340 472 | 24 761 | 205 207 | 471 847 | 17 175 | 231 147 | 23 552 |
| 1978 | 775 380 | 726 389 | 330 904 | 22 554 | 197 559 | 453 139 | 22 587 | 238 871 | 24 381 |

^a Excludes re-exports. nc - not collected, na - not available.

Source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989–90).

Table 1.2 Performance ratios for the whitegoods industry and total manufacturing, 1970 to 1978

| Year | Share of domestic market | Value added per employee | Wages to turnover ratio | Purchases to turnover ratio | Investment turnover ratio | Effective rate of assistance | Nominal rate of assistance | IIT index | Exports to turnover (a) |
|--------------------------|--------------------------------|--------------------------------|-------------------------------|-----------------------------------|---------------------------------|------------------------------------|----------------------------------|--------------|----------------------------|
| | % | \$'000 | % | % | % | % | % | % | % |
| Whitegoods | | | | | | | | | |
| 1970 | 91.0 | 6.2 | 22.2 | 60.5 | 2.8 | 54 | 39 | 45.4 | 2.5 |
| 1971 | | | | | | 57 | 39 | 43.8 | |
| 1972 | 87.6 | 7.1 | 23.9 | 59.5 | 1.9 | 58 | 38 | 45.0 | 3.4 |
| 1973 | 86.8 | 7.5 | 23.7 | 58.1 | 1.9 | 58 | 38 | 45.4 | 3.7 |
| 1974 | 74.7 | 8.8 | 24.9 | 62.1 | 2.4 | 41 | 27 | 29.7 | 3.2 |
| 1975 | 75.7 | 10.8 | 26.6 | 61.0 | 2.8 | 34 | 26 | 25.0 | 3.9 |
| 1976 | 79.6 | 12.1 | 26.4 | 57.4 | 2.1 | 37 | 27 | 24.6 | 3.0 |
| 1977 | 75.5 | 13.8 | 25.9 | 59.6 | 2.2 | 37 | 26 | 18.5 | 2.8 |
| 1978 | 74.6 | 14.7 | 25.5 | 58.4 | 2.9 | 39 | 25 | 18.5 | 2.9 |
| All Manufacturing | | | | | | | | | |
| 1970 | 86.1 | 6.4 | 20.9 | 61.6 | 5.0 | | | 74.6 | 9.2 |
| 1971 | | | | | | | | 71.4 | |
| 1972 | 87.0 | 7.4 | 22.2 | 60.1 | 5.2 | | | 81.6 | 9.9 |
| 1973 | 87.7 | 8.2 | 22.0 | 59.8 | 4.7 | | | 92.4 | 11.4 |
| 1974 | 85.2 | 9.8 | 22.9 | 61.1 | 3.8 | | | 76.9 | 10.4 |
| 1975 | 83.1 | 12.2 | 24.2 | 60.4 | 4.1 | | | 72.5 | 11.0 |
| 1976 | 84.3 | 14.1 | 23.9 | 58.2 | 3.6 | | | 74.7 | 10.7 |
| 1977 | 83.0 | 16.5 | 23.2 | 58.4 | 3.4 | | | 73.9 | 11.7 |
| 1978 | 82.8 | 17.7 | 23.2 | 59.2 | 3.9 | | | 73.9 | 11.7 |

Source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989–90).

Share of the domestic market

Over the 1970s, the whitegoods industry suffered a decline in market share at a much faster rate than manufacturing generally. Its share of the domestic market fell from 91 per cent in 1970 to around 75 per cent in 1978. By contrast, the manufacturing sector's share of the domestic market fell from 86 per cent to nearly 83 per cent.

Figure 1.1 **Share of domestic market for the whitegoods industry and total manufacturing, 1970 to 1978**
Per cent

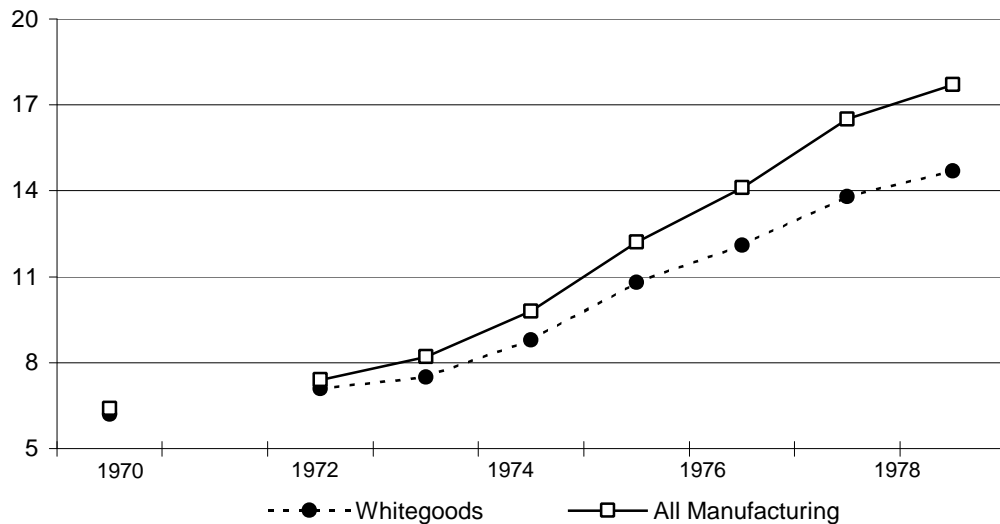


Source: Attachment A.

Productivity

Growth in value added per employee in whitegoods manufacturing lagged that for the manufacturing sector generally over the 1970s, despite the rationalisation which occurred.

Figure 1.2 Value added per employee for the whitegoods industry and total manufacturing, 1970 to 1978
\$000

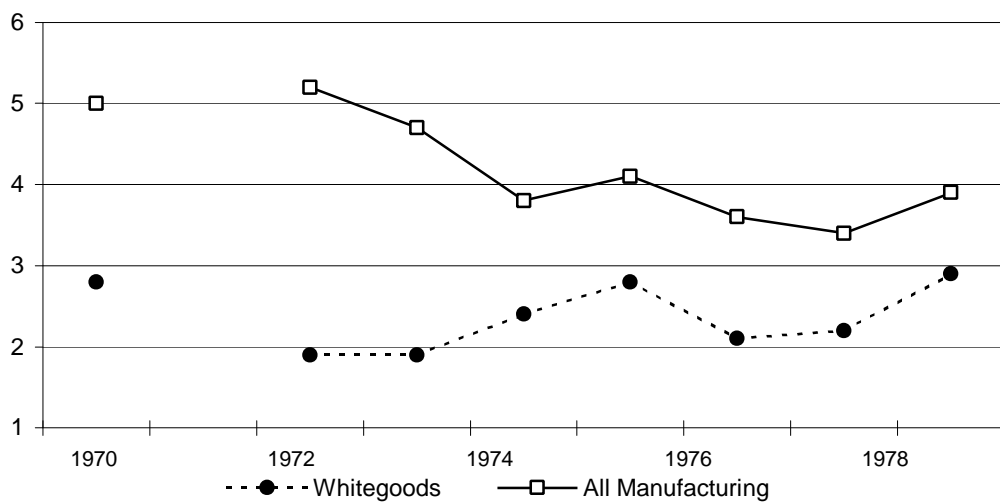


Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90).

Investment

Part of the explanation of the relatively slower growth in productivity of whitegoods manufacturing over the 1970s was a relatively low level of investment.

Figure 1.3 Investment to turnover ratio for the whitegoods industry and total manufacturing, 1970 to 1978
Per cent

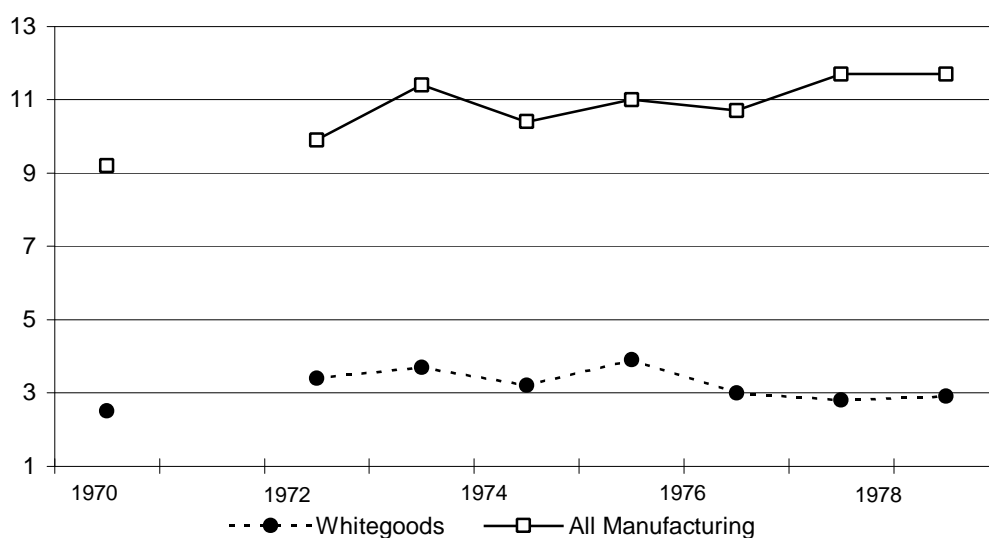


Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90).

Export performance

Exports of whitegoods remained a low priority for local manufacturers over the whole of the 1970s. The only consistent export markets were New Zealand and Papua New Guinea. The exports to turnover ratio for the whitegoods industry remained well below that of all manufacturing generally and by the end of the 1970s was showing signs of declining even further.

Figure 1.4 **Exports to turnover ratio for the whitegoods industry and total manufacturing, 1970 to 1978**
Per cent



Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90).

Profitability

The profitability of whitegoods manufacturers was generally higher than that for all manufacturing over most of the 1970s.

Table 1.3 **Profitability for the whitegoods industry and total manufacturing, 1971-72 to 1975-76**
Per cent

| | 1971-72 | 1972-73 | 1973-74 | 1974-75 | 1975-76 |
|-------------------|---------|---------|---------|---------|---------|
| Whitegoods | 14.3 | 20.0 | 14.2 | 16.8 | 12.2 |
| All manufacturing | 11.5 | 13.0 | 12.6 | 12.1 | 13.1 |

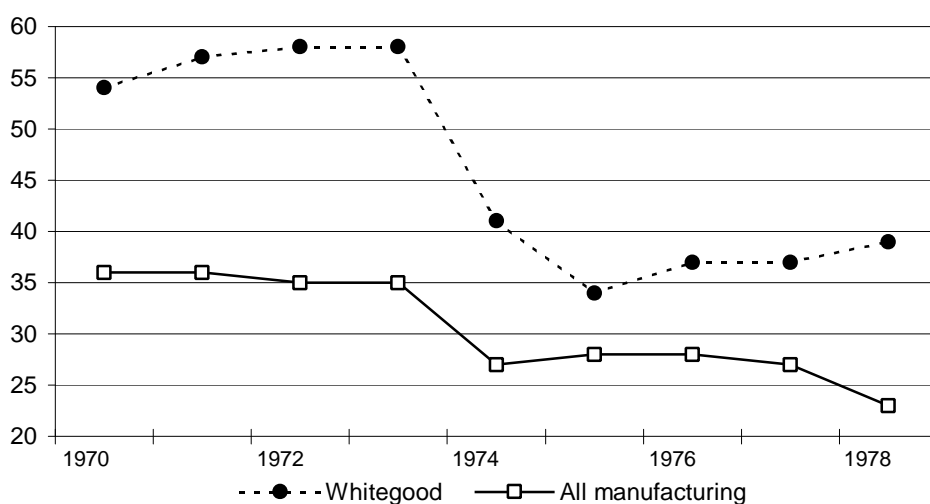
Note: Profitability is measured as average profits to funds.

Source: IAC (1978, p. 9).

Effective rate of assistance

The effective rate of assistance for whitegoods manufacturing over the 1970s was well above that afforded all manufacturing generally. This assistance was essentially provided on a 'needs' basis but it does appear to have also contributed some economic rent to the industry in the form of relatively high profitability despite a generally poor productivity performance.

Figure 1.5 **Effective rates of assistance for the whitegoods industry and total manufacturing, 1970 to 1978**
Per cent



Source: IC (1995a).

Structure

There had already been extensive rationalisation in whitegoods in the 20 years prior to the 1970s. The number of refrigerator and washing machine producers, for example, had been reduced from 18 to nine and from 26 to nine respectively, and the total number of firms in the industry had fallen from 40 in 1954 to 20 in 1971 to 15 in 1978 (BIE 1983, p. 18).

Even with this number of producers, the industry was relatively concentrated in 1971. The four largest held a share of 53 per cent of domestic production in volume terms and the largest eight held a share of 81 per cent. The largest four producers of refrigerators and freezers were Kelvinator, Email, General Industries and Malleys, holding a share of 73 per cent of domestic production. The major four washing machine producers were Hoover, Simpson, Malleys and Wilkins-Servis with an 80 per cent share. General Industries, Malleys, Roden and Craig and Seeley were the

main producers of electric ranges and were responsible for 70 per cent of domestic production. Some of these companies operated more than one plant and sometimes produced the same goods in different plants.

Summary of the Australian whitegoods industry prior to MER

Although considerable rationalisation occurred in the Australian whitegoods industry over the 1970s, the industry remained in a vulnerable position at the end of the decade. Productivity growth and investment was below that of manufacturing generally. Domestic market share was being eroded at a relatively fast rate but the industry was showing little interest in developing export markets. Its structure remained fragmented with too many manufacturers relative to the size of the available market.

Despite these problems, profitability remained relatively high compared with other manufacturing industries. There seems little doubt that this combination of poor performance but high profitability was being sustained only by the high levels of assistance afforded the industry over this period.

Without substantial change to the policy framework, it is probable that the relatively poor performance trends established during the 1970s for the Australian whitegoods industry would have continued for some time.

1.3 MER and other influences during the 1980s and 1990s

Until well into the 1980s, the Australian whitegoods industry remained highly regulated. Market prices were significantly influenced by import barriers; a centralised system of determining wages and conditions existed; unique Australian standards applied; different product approval requirements existed between Australian States and between Australia and our major trading partners; and significant input costs were controlled by Government Business Enterprises largely shielded from competitive market pressures.

This web of regulation began to disentangle around the mid-1980s when the Government adopted policies to open up the Australian economy to global competition. The Australian dollar was floated, the financial sector deregulated and trade liberalisation programs put in place. Labour market reforms followed along with changes in technical regulation and agreements for mutual recognition between Australian States and with other countries. Competition policies ensured the regulatory functions of Government Business Enterprises were separated from

commercial operations. In the space of around 10 years, the regulatory environment surrounding the Australian whitegoods industry changed substantially.

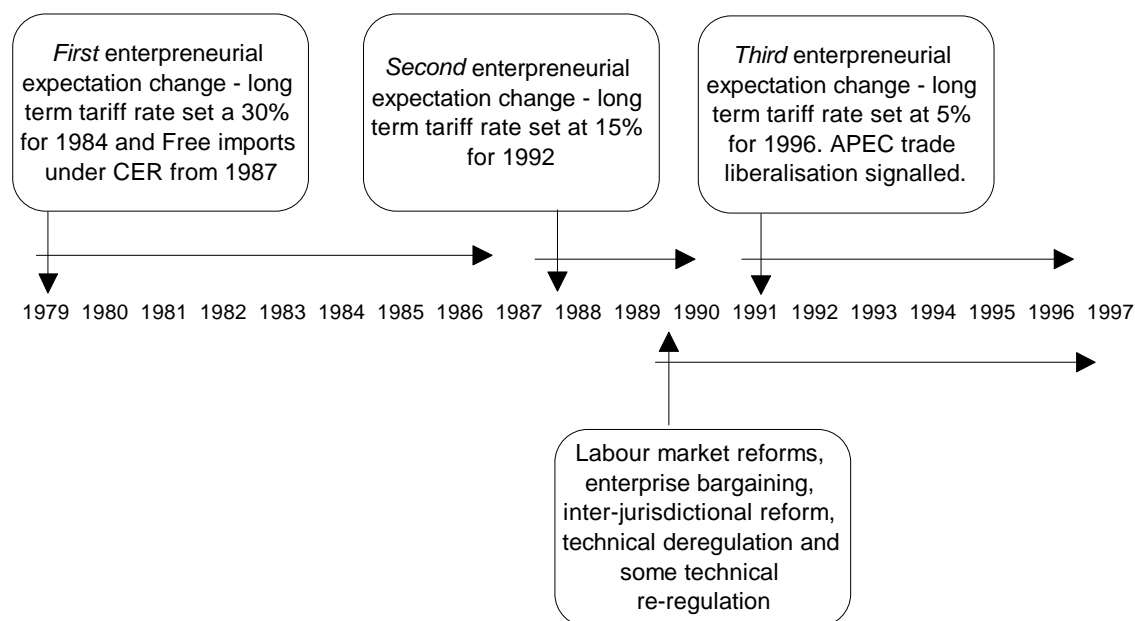
In this Section, the major microeconomic reforms and obstacles, which have impacted on the whitegoods industry over the last decade or so, are examined namely:

- Trade reforms;
- Labour market reforms;
- Technical regulation;
- Inter-jurisdictional changes; and
- Other general MER.

The process of MER has been continuous throughout the 1980s and 1990s (see figure 6). Entrepreneurial expectations about on-going high import protection were initially changed in the late 1970s with the Government's decision on the IAC's 1978 report. Those expectations were further lowered in the May 1988 when the Government announced its program of general tariff reductions and again in 1991 when that program was extended. The industry was also aware in the early 1980s that the Closer Economic Relations Agreement between Australia and New Zealand would mean duty free imports from New Zealand by 1987. The APEC Agreement in the early 1990s also provided a strong signal to the industry that it would have to cope with free trade between members early into next century.

MER time line

Figure 1.6 MER time line



These changes in protection levels were being supported in the early 1990s by a progressive freeing up of the labour market and a breaking down of the potential for non-tariff barriers through the signing of both national and international mutual recognition agreements. By the early 1990s, the policy framework in which the whitegoods industry operated was vastly different from that of the early 1980s.

Trade Reforms

Changes to assistance policy have impacted on the industry throughout most of the last 20 years. During this time, the industry had to operate under two different philosophies relating to tariff induced structural adjustment. For much of the 1970s and early 1980s, the industry had become accustomed to being able to internally restructure under an umbrella of high levels of nominal and effective rates of assistance compared with the rest of manufacturing. The extent of that restructuring was substantial although the pace of change was not as fast as it could have been because of the competitive constraints which continued to apply to imports.

In the mid-1980s, however, a change in Government policy to trade liberalisation meant that the industry became increasingly exposed to competition. Adjustment had to proceed much faster under a regime of lower protection. The full extent of

changes in barrier assistance for the Australian whitegoods industry is outlined in table 1.4.

The changes in protection policy began in the early 1970s with the 25 per cent across the board tariff cut and the Government's subsequent acceptance of Tariff Board recommendations to further reduce duties on imports of most whitegoods. Import competition increased substantially in 1973-74 and 1974-75 and, as a consequence, tariff quotas were introduced. In 1978, the quotas were removed and replaced by a 45 per cent tariff rate which designed to initially approximate the quota level of assistance. These duties were to be reduced to a long term rate of 30 per cent over four years to allow the industry time to further restructure.

During the mid-1980s, the Government announced a general program of phased tariff reductions commencing in May 1988 which had the effect of reducing most of the higher tariff rates, including those applying to whitegoods, to 15 per cent. In March 1991, the Government announced that the program of tariff cuts would continue beyond 1992 resulting in a phasing of rates to 5 per cent by 1996.

Table 1.4 Tariff rates for selected whitegoods, 1973 to 1996

| | | <i>Refrigerators</i> | | <i>Freezers</i> | | <i>Washing machines</i> | | <i>Clothes dryers</i> | |
|-----------------------------|-----------|----------------------|----------|-----------------|----------|-------------------------|----------|-----------------------|----------|
| | | 200-450lt>454 lt | | <454 lt >454 lt | | | | | |
| Before | July 1973 | 37.5 | 47.5 | 37.5 | 47.5 | 55 | | 45 | |
| General | Sept 1973 | 28 | 36 | 28 | 36 | 41 | | 34 | |
| 25% tariff cut | | | | | | | | | |
| From | Apr 1974 | 25 | 35 | 25 | 35 | 35 | | 25 | |
| From | Apr 1975 | 25 | 30 | 25 | 30 | 30 | | 25 | |
| Tariff equivalent of quotas | Dec 1975 | 47.5 | 47.5 | | | 45 | | 45 | |
| From | Jun 1978 | 45 | NZ:30 | 45 | NZ:30 | 45 | NZ:30 | 35 | NZ:20 |
| From | Jun 1980 | 40 | NZ:25 | 40 | NZ:25 | 40 | NZ:25 | 30 | NZ:15 |
| From | Jun 1982 | 35 | NZ:20 | 35 | NZ:20 | 35 | NZ:20 | 30 | NZ:15 |
| From | Jun 1984 | 30 | NZ:15 | 30 | NZ:15 | 30 | NZ:15 | 30 | NZ:15 |
| From | Jul 1987 | | NZ: Free | | NZ: Free | | NZ: Free | | NZ: Free |
| From | Jul 1988 | 23 | DC:18 | 23 | DC:18 | 23 | DC:18 | 23 | DC:18 |
| From | Jul 1989 | 21 | DC:16 | 21 | DC:16 | 21 | DC:16 | 21 | DC:16 |
| From | Jul 1990 | 19 | DC:14 | 19 | DC:14 | 19 | DC:14 | 19 | DC:14 |
| From | Jul 1991 | 17 | DC:12 | 17 | DC:12 | 17 | DC:12 | 17 | DC:12 |
| From | Jul 1992 | 15 | DC:10 | 15 | DC:10 | 15 | DC:10 | 15 | DC:10 |
| From | Jul 1993 | 12 | DC:7 | 12 | DC:7 | 12 | DC:7 | 12 | DC:7 |
| From | Jul 1994 | 10 | DC:5 | 10 | DC:5 | 10 | DC:5 | 10 | DC:5 |
| From | Jul 1995 | 8 | DC:3 | 8 | DC:3 | 8 | DC:3 | 8 | DC:3 |
| From | Jul 1996 | 5 | DC:Free | 5 | DC:Free | 5 | DC:Free | 5 | DC:Free |

DC denotes Developing Country.

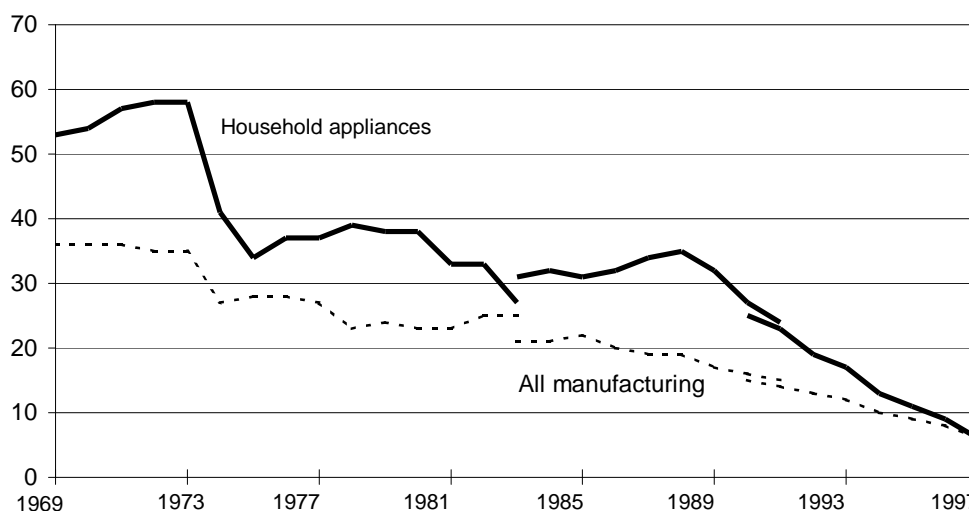
Source: BIE (1983); IAC Annual Reports (various).

Tariff reductions have been a key part of the Government's MER agenda both internally through the programs of general reductions concluded in 1996 and externally through the international trade liberalisation processes. The Australian Government was a leading proponent of freer trade and investment within the Asia Pacific Economic Cooperation forum now embodied in the Bogor declaration. It also passed legislation in 1995, giving effect to the WTO Uruguay Round Agreements and supported earlier GATT Agreements towards more open international trade. These processes sent strong signals to the relatively highly assisted sectors of manufacturing that tariff reductions were an inexorable process to which firms must adapt.

The Australian whitegoods industry was affected more than most industries by the extent of this reform because its base level of assistance at the end of the 1970s was relatively high. This is illustrated in figure 1.7 which shows effective rates of assistance³ for Household Appliances compared with those for All Manufacturing for the period 1969 to 1997.

Figure 1.7 Effective rates of assistance for household appliances and total manufacturing, 1969 to 1997

Per cent



Source: IAC, Annual Reports, (various).

The Australia New Zealand Closer Economic Relations Trade Agreement (CER) also had a significant impact on the local industry's competitive position because of the existence of a major New Zealand manufacturer, Fisher & Paykel. Australian import tariffs on all whitegoods from New Zealand were removed under the CER

³ Refer Attachment A.

on 1 July 1987. However, access for Australian manufactured whitegoods being sold into the New Zealand market remained subject to import licensing based on maximum shares of the New Zealand market which in 1988 ranged from 17.5 per cent for stoves and ranges to 30 per cent for refrigerators, freezers and dishwashers. Licences were provided on demand post-1989 for all whitegoods except stoves and ranges where volume restrictions remained until 1991⁴

The extent of trade reform has had a major impact on the structure of the Australian whitegoods industry and its markets. It greatly increased competition in the whitegoods market and placed cost and price constraints on Australian manufacturers. The relative advantage provided to Fisher & Paykel until the mid-1980s under the CER also contributed to competitive market pressures on Australian suppliers.

Labour Market Reform

The early 1990s saw a move away from the rigid structure of complex employee Awards to more streamlined and flexible Enterprise Agreements. At the time, the Australian whitegoods industry was a mixture of unionised and non-unionised plants. The new approach provided for all enterprises to access enterprise bargaining including those with few or no union members. Enterprise bargaining allowed for productivity increases to be written in to agreements and paved the way for much closer involvement of workers in the decision-making processes of manufacturing operations. The Australian whitegoods industry embraced these reforms and Certified Agreements were developed and implemented in each of the manufacturing plants.

Technical Regulation

The whitegoods industry is subject to a range of safety, product and environmental controls. Some of these have been imposed through State legislation and others through Commonwealth legislation. Through much of the 1980s, product approval regulations were different across the various States and Australia maintained unique standards which often did not align with international standards.

The processes of microeconomic reform have had a considerable impact in eliminating such differences. But in other cases, new regulations have been introduced which increased compliance costs for suppliers.

⁴ Australia New Zealand Closer Economic Relations Trade Agreement (CER), Attachment VII of Annex C.

Regulation of product standards can be:

- *compulsory*, with adherence enforced through a regulatory process backed by legislation; or
- *voluntary*, where adherence has no legislative backing.

Standards, whether compulsory or voluntary, are usually in the form of:

- *Information provision standards*, aimed at providing a minimum level of information about a product or service to potential buyers (for example, energy labelling for refrigerators and freezers, air conditioners, clothes washers, tumble dryers and dishwashers – compulsory);
- *Product/service quality standards*, designed to ensure that only product/services which meet certain minimum technical criteria are allowed to be sold in the market (for example, minimum energy performance standards (MEPS) for refrigerators and freezers; electromagnetic compatibility (EMC) for all electrical and electronic equipment; minimum product safety requirements; and banning the use of CFCs in refrigerators — all compulsory); or
- *Product/service compatibility standards*, designed to ensure that a compatible interface exists between two or more products or services (for example, international standards and mutual recognition arrangements).

Information standards rely on consumers' preferences on price and quality to determine patterns of demand for products and services. Product and service quality standards directly reduce consumer preferences at the lower end of the quality spectrum.

Compulsory compliance with standards of all types increase suppliers' costs of production (unless the standard does not change what the supplier would be doing in the absence of the standard).

The additional costs imposed on suppliers arise from:

- production re-design costs to meet the designated standard;
- costs associated with enhanced quality control systems;
- administrative costs of record keeping; and
- opportunity cost of scarce engineering resources having to be applied to ensuring regulatory compliance.

Product regulations will provide benefits to some consumers by assisting informed choice, reducing availability of poorer quality products and by ensuring compatibility. These benefits represent gains for which these consumers would be

willing to pay. Other consumers may not favour choice being restricted and may be unwilling to share the additional costs of regulation.

The general analytical approach to assessing costs and benefits of standards should have regard to the additional costs imposed on industry by the standard relative to the benefits for consumers. If the costs imposed on industry by the standard are greater than consumers' willingness-to-pay for the improved information/product quality, then the regulation cannot be supported on economic grounds.

Since the mid-1980s, the Australian whitegoods industry has experienced substantial changes in the technical regulatory environment in which it operates. Some of these changes have been to the industry's benefit. Others have imposed considerable costs. Some could reasonably be labelled as reforms but others have added considerably to the industry's costs. A discussion of the influence of technical regulation is set out in Attachment 4.

Inter-jurisdictional Reform

Improving the way governments work together to promote and extend pro-competitive policies and to remove anti-competitive legislation is a central element of MER. Such reform seeks to ensure that there is inter-jurisdictional policy consistency across governments in Australia and that reform is locked in on a broad front. Legislative implementation is through three inter-governmental agreements: the *Conduct Code Agreement*, the *Competition Principles Agreement* and the *Agreement to Implement the National Competition Policy and Related Reforms*.

The beneficial effects of inter-jurisdictional reforms on whitegoods are mostly indirect. They relate to modifications to competition law; ensuring competitive neutrality between private and public providers of similar services; prices oversight of government enterprises; and ensuring fair and equal access to essential services. These changes alter the broad framework in which business and government co-exist and compete in Australia's mixed economy. But these Agreements also are the basis for structural reform of public monopolies in the supply to industry of gas, water, electricity and telecommunications. Any major user of these services including the whitegoods industry will benefit from increased competition in the supply of those services. The Agreements also ensure that any anti-competitive legislation which restricts competition must be reviewed and justified according to the guidelines set out in the *Competition Principles Agreement*. This makes it more difficult for governments to impose additional costs on the industry through excessively onerous safety, labelling or performance regulation.

By establishing the framework for more effective competition in the economy generally, inter-jurisdictional reforms indirectly benefit all industries. The effect on individual industries such as whitegoods are difficult to quantify but must outweigh the costs which are zero. It is too early yet to see the cost impact for companies arising from more competitive utility prices.

Other Influences

Over the last 20 years, the single most non-industry specific change that affected the whitegoods industry was freeing the Australian dollar. Volumes of both exports and imports of whitegoods appear to be exchange rate sensitive. The industry generally believes that the export market becomes difficult with the Australian dollar in the US \$0.75 range.

There have been no real breakthroughs in embodied technology in whitegoods product over that time although production technology has changed substantially, as it has in most high volume light manufacturing operations. Demand remains susceptible to fluctuations in the building cycle and dependent on the replacement market.

1.4 MER pressures, strategic responses and outcomes

MER induced pressures

The continuous reductions in tariff protection over the 1980s and 1990s combined with free trade across the Tasman placed enormous competitive pressure on Australian whitegoods manufacturers. The reductions came on top of a decade of industry rationalisation in the 1970s which, although it had reduced the number of local manufacturers, had not had a great impact on improving the industry's relative productivity performance. The industry was struggling to maintain its share of the domestic market, exports were insignificant and investment was low. It was an industry which seemed dependent on tariff protection to support its profit position. Throughout the 1970s, that protection had usually been forthcoming for local whitegoods producers.

Entrepreneurial expectations that adequate tariff protection would continue into the 1980s were adjusted when the long term rate of 30 per cent was announced in 1978. They were further challenged when the programs of general reductions in tariff rates were announced in 1988 and again in 1991. Also with Fisher & Paykel able to import duty free into the larger Australian market from New Zealand by 1987, the

local industry was under constant pressure to compete in more open markets. To do so, it needed to transform itself from the under-performing industry of the 1970s into one of world best manufacturing practice.

The tariff-induced competitive pressures came at a time when light manufacturing operations were being transformed by technological change. Local whitegoods manufacturers embraced the new technology in an effort to improve efficiency and considerable labour was shed over the 1980s. However, the changes created other pressures for the organisation of labour. Decision-making was being increasingly devolved from a declining middle management to labour on the shop floor. But the labour market continued to be dominated by centralised wage fixing and complicated Awards which reduced the flexible deployment of employees. All this changed in the early 1990s when enterprise bargaining was introduced. The flexibility inherent in enterprise bargaining provided the opportunity for whitegoods manufacturers to complete the restructuring towards world best practice. In the process, it helped to shore up their competitive position relative to imports.

Strategic responses to MER

In addition to the competitive pressures imposed by the MER induced trade reforms, local manufacturers were also competing actively with each other. This competition alone would have also contributed to continuous improvement in performance even without MER. But it is doubtful whether the pace or extent of the change observed over the 1980s and 1990s would have been anywhere near what would have occurred in the absence of MER. Besides competitive pressure, some MER such as labour market and technical deregulation opened up new opportunities for realising productivity improvement.

The major strategic responses by the industry have involved:

- Company and plant rationalisation;
- Modernisation of manufacturing operations;
- Implementing enterprise bargaining;
- Cross supply arrangements;
- Designing for the world market;
- Developing export markets; and
- Differentiating its products.

Company and Plant Rationalisation

A period of substantial adjustment and rationalisation of production capacity commenced following the Government's 1978 decision on future tariffs. In 1979, Email took over Kelvinator, Simpson took over Malleys and Rank Industries Australia merged with Australian General Electric Appliances. As a result, the market share of the largest two firms rose from 31 per cent in 1971 to 69 per cent in 1980-81 (BIE 1983).

The BIE provided the following picture of the structure of the whitegoods industry in 1980-81.

Table 1.5 Concentration in Australian whitegoods production, 1980-81
Estimated share of production

| <i>Company</i> | <i>Fridges</i> | <i>Clothes washers</i> | <i>Clothes dryers</i> | <i>Electric stoves</i> |
|----------------|----------------|------------------------|-----------------------|------------------------|
| | % | % | % | % |
| Simpson | 14 | 57 | 60 | 38 |
| Email | 51 | 15 | 14 | 25 |
| Hoover | | 28 | 25 | |
| Philips | 13 | | | 10 |
| Rank-GE | 21 | | | |
| Vulcan | | | | 14 |
| Other | | | | 13 |
| Total | 100 | 100 | 100 | 100 |

Source: BIE (1983).

Later in the 1980s and early 1990s, the pattern of acquisition, mergers and closures continued. Email became the largest whitegoods manufacturer in Australia by absorbing other well known groups and brands including Westinghouse, Frigidaire, Simpson, Pope and Malleys. Southcorp followed a similar strategy absorbing Vulcan (1986), Rheem Australia Ltd (1988), and Hoover Australia Ltd (1995). The New Zealand owned Fisher & Paykel commenced production of refrigerators in Brisbane in 1991 and washing machines in 1997.

Details of plant rationalisation in the Australian and New Zealand whitegoods industry over the last decade or so are set out in table 6.

This rationalisation and restructuring has allowed the manufacturers to achieve higher economies of size, greater capacity utilisation and increased specialisation. Some inefficient plants have been closed.

Table 1.6 Company and plant rationalisation 1978 to 1988

| <i>Company</i> | <i>Factory Location</i> | <i>Current production</i> | <i>Former production</i> |
|--|---|---|---|
| Email | Orange, NSW | Refrigerators Chest freezers | Washing machines, ceases 1984 Refrigeration compressors, ceased 1980 Cookers, transferred from Metters Bankstown plant in 1984 and to Dudley Park, 1990 |
| Metters taken over by Simpson, 1976 | Bankstown, NSW | nil | Cookers, transferred to Orange, 1984 |
| Malleys taken over by Simpson, 1986 | Sydney, NSW | nil | Washing machines, ceased 1976 Refrigerators and chest freezers, transferred to Sunbury, 1979 |
| Simpson taken over by Email, 1986 | Beverley, SA Dudley Park, SA Regency Park, SA Christchurch, NZ Sunbury, Vic | Washers and tumble dryers Cookers Dishwashers Cookers Nil | Refrigerators and chest freezers, ceased 1985 |
| Kelvinator taken over by Email, 1980 | Woodville North Keswick, SA | Room air conditioners Range hoods nil | Refrigerators, transferred to Orange, 1994 Refrigerators compressors, ceased 1980 |
| Philips taken over by Hoover, 1983 taken over by Southcorp, 1995 | Clayton, VIC | Refrigerators | |
| Hoover taken over by Southcorp 1995 | Meadowbank, NSW | Washers and tumble dryers | |
| Vulcan taken over by Southcorp, 1986 | Bayswater, VIC Brunswick, VIC | Dishwashers Cookers | |
| Fisher & Paykel | Cleveland, Qld East Tamaki, NZ Dunedin, NZ Mt Wellington, NZ | Refrigerators, new plant 1993 Washers, new plant 1997 Refrigerators Chest freezers Dishwashers Cookers | Washers, transferred to Mt. Wellington, 1985 Washers, transferred to East Tamaki, 1985 Dishwashers, transferred to Dunedin, 1985 |
| St George | Sydney, NSW | Cookers | |
| Rank GE | Blacktown, NSW | nil | Plant closed around 1985 |

Source: Various company statements, company annual reports, press reports, industry knowledge.

Modernisation of Manufacturing Operations

Most of the Australian and New Zealand manufacturing facilities now use world best technology. Developments in technology and robotics has meant that production processes are less dependent on economies of size. Computer integrated production systems are commonly used to accommodate a wide range of models. Single product plants with flexible capital and labour is now common.

Implementing Enterprise Bargaining

Email, Southcorp and Fisher & Paykel each have registered enterprise agreements in place covering the plants producing whitegoods in Australia. The objectives embodied in each of the agreements highlight the need to improve company competitiveness and to achieve best practice operations in a co-operative framework endorsed by both management and employees. The following extract from the Agreement applying to whitegoods manufacturing at Email's Beverley plant in South Australia provides an example of the increased flexibility achievable under the Agreements compared with the former rigidities of Awards and centralised determination of wages and conditions.

Box 1.1 Extract from Certified Agreement E 0140 (1997) — Email's Beverley Plant in SA

This agreement encompasses the shared commitment of all parties to the development of continuous improvement to achieve world competitiveness both domestically and internationally.

The commitment ensures that existing consultative processes are used to reduce manufacturing costs and to improve labour utilisation. This will ensure that the current and future work teams operate with flexibility to manufacture quality products to satisfy customer requirements.

To achieve this they will be trained in new production techniques and work methods. This will lead to the elimination of waste in all its forms as well as improved communication and current organisational structures.

Improvement in quality and the reduction in manufacturing costs will assist in maintaining job security, an improvement in employee recognition and support the continuance of investment in new technology and research and development.

(2) Site Improvements

The following processes are an agreed procedure for the reduction of manufacturing costs and the improved utilisation of labour at the Email Laundry Division, Beverley Site. This is to be achieved by continuous improvement towards World competitiveness and Best Practice by effective utilisation of equipment, labour and raw materials.

This reduction of costs is to be achieved by the elimination of waste in a number of areas include, but not limited to:

1. Waste from over production
2. Waste from waiting time
3. Waste from unnecessary transportation
4. Waste from unnecessary processing
5. Waste from unnecessary in-process work
6. Waste from unnecessary motion

Waste from defective manufacture

The parties agree to:

- a. The more effective organisation of work processes in all areas by the involvement of the relevant work teams. Teams will be involved in the improvement and development of all operations, including content, timing and layout.

(Continued on next page)

Box 1.1 (Continued)

b. Employees will be trained in the principles of standardised work to be more effective in the use of their work time. This training will enable employees to better understand the need for smooth, waste free work processes. This will also include the removal and/or re-assignment of excessive indirect support functions and mechanisms to measure continuous improvement.

c. Joint collaboration between operational and maintenance personnel to improve the availability and utilisation of all plant and equipment.

d. World Best Practice labour levels for machinery and processes will be achieved through a consultative process involving management, employees and their elected representatives.

Savings will only be achieved from these cost reduction measures when there is a real reduction in the labour force.

Source: OSIRIS database at <http://indrel.agps.gov.au>.

Cross supply arrangements

Prior to the Email takeover of Kelvinator in 1979, Fisher & Paykel supplied Kelvinator with compact refrigerators, chest freezers and dishwashers. Kelvinator supplied Fisher & Paykel with large refrigerators and air conditioners. After the Kelvinator takeover, Email ceased marketing dishwashers under the Kelvinator brand and sourced compact refrigerators and chest freezers from its Orange plant. It continued to market Fisher & Paykel refrigerators in Australia under the Frigidaire brand. The company had little presence in the New Zealand market until it took over Simpson in 1985 which had been marketing there for some time.

With the full impact of import barrier reductions between Australia and New Zealand starting to bite in the mid 1980s, Email and Fisher & Paykel ended their cross-supply arrangement. Each company decided to sell a full range of its own refrigeration, washing and cooking products in both markets.

Various arrangements have existed at times to source badged products offshore. Generally, such arrangements have sought to supplement rather than replace local manufacture and appear to be exchange rate dependent. Email used to import mainly low end product from Gorenje in Slovenia and badge it as Frigidaire. It currently imports front loading washing machines (which are not made in Australia) and badges them as either Kelvinator or Westinghouse product. Both Email and Southcorp are believed to have also sourced some products from Korea.

Product designs

Whitegoods manufacturers today design products with world markets in mind. There are joint Australia/New Zealand product standards for whitegoods which are based on international standards. This results in world products which are generally similar in styling and function. However, there remains some Australia — New Zealand demand driven peculiarities that differentiate local products from imports. For example, ranges with separate grill compartments are common in Australia but rare elsewhere. Top loading clothes washers are preferred in Australia to the front loading tumble action washers common in Europe and the United States. To some degree, these preferences provide the local manufacturers with some natural protection. However, top loaders are much more water and energy intensive. Water use restrictions and global warming abatement measures being widely introduced may place the longer term future of the Australian/New Zealand top loaders in some doubt.

Export market development

The industry has put considerable investment into developing export markets in an effort to not only to expand its available market base and to make better use of economies of size, but also to make it less susceptible to local market fluctuations. Annual exports (excluding re-exports) are now worth nearly \$200 million.

Product differentiation

Whitegoods are major items of expenditure for most households. Consumers seem to place considerable importance on brand name. Names such as Westinghouse, Kelvinator and Fisher & Paykel consistently score well in consumer brand preferences and awareness surveys. The “Australianness” of locally manufactured product is also emphasised at point of sale. Consumer familiarity with the somewhat unique features of some local whitegoods (for example, top loading washers and grill compartments in ovens) has also helped to differentiate local models from imported models not offering those features.

Research and development

Research and development expenditure by the whitegoods industry compared with all manufacturing is shown in table 1.7. The data show that research and development expenditure as a percentage of turnover by the whitegoods industry was around twice that for Australian manufacturing as a whole.

Table 1.7 Research and development expenditure for the whitegoods industry and total manufacturing, 1986-87 to 1995-96

| <i>Year</i> | <i>Whitegoods</i> | <i>As a percentage of turnover</i> | <i>All manufacturing</i> | <i>As a percentage of turnover</i> |
|-------------|-------------------|------------------------------------|--------------------------|------------------------------------|
| | | % | | % |
| 1986-87 | 17 666 | 1.3 | 703 807 | 0.6 |
| 1988-89 | 22 511 | 1.2 | 959 614 | 0.6 |
| 1990-91 | 23 024 | 1.3 | 1 148 068 | 0.7 |
| 1991-92 | 32 903 | 1.8 | 1 345 691 | 0.8 |
| 1992-93 | 33 972 | 1.8 | 1 694 424 | 1.0 |
| 1993-94 | 36 399 | 1.7 | 1 719 649 | 0.9 |
| 1994-95 | 38 206 | 2.0 | 1 931 592 | 1.0 |
| 1995-96 | 33 388 | 1.5 | 2 429 933 | 1.2 |

Source: Unpublished data provided by ABS.

Performance outcomes

The key structural information on the Australian whitegoods industry since 1979 is shown in table 1.8.

Table 1.8 Structural changes and performance ratios for the whitegoods industry, 1979 to 1996

| <i>Year</i> | <i>Turnover</i> | <i>Sales/ trans</i> | <i>Value added</i> | <i>Employ- ment</i> | <i>Wages/ salaries</i> | <i>Purchases</i> | <i>Investment</i> | <i>Imports</i> | <i>Exports</i> |
|--------------------|-----------------|-------------------------|------------------------|-------------------------|----------------------------|------------------|-------------------|----------------|----------------|
| ASIC 3353 | \$'000 | \$'000 | \$'000 | No | \$'000 | \$'000 | \$'000 | \$'000 | \$'000 |
| 1979 | 887 857 | 829 783 | 362 099 | 22 592 | 220 210 | 552 573 | 23 086 | 270 902 | 29 465 |
| 1980 | 1 023060 | 969262 | 420083 | 22137 | 236595 | 630741 | 22035 | 271483 | 39693 |
| 1981 | 1130823 | 1075269 | 447488 | 21602 | 253119 | 688546 | 17010 | 307928 | 52169 |
| 1982 | 1248048 | 1170981 | 489069 | 20159 | 277170 | 795898 | 25722 | 398869 | 56803 |
| 1983 | 1113028 | 1039064 | 412027 | 16499 | 258496 | 658654 | 18844 | 426710 | 36216 |
| 1984 | 1182500 | 1100600 | 499400 | 16100 | 252300 | 686100 | 19100 | 511019 | 55621 |
| 1985 | 1203200 | 1134200 | 517800 | 15600 | 268500 | 678000 | 22500 | 624025 | 50398 |
| 1986 | nc | nc | nc | nc | nc | nc | nc | 695492 | 49895 |
| 1987 | 1379500 | 1320200 | 603500 | 15000 | 289400 | 776400 | | 631545 | 92750 |
| 1988 | 1653100 | 1597600 | | 15331 | 323100 | | | 780985 | 98324 |
| 1989 | 1898900 | 1827200 | | 15200 | 337100 | | | 862590 | 96028 |
| 1990 | 1732300 | 1660639 | 824400 | 13000 | 327300 | 938000 | 49299 | 981518 | 96139 |
| 1991 | 1800900 | 1726401 | | 12706 | 332700 | | | 848325 | 102964 |
| 1992 | 1785600 | 1711734 | | 12043 | 324500 | | | 926020 | 126946 |
| ANZ SIC 2851 | | | | | | | | | |
| 1993 | 1937900 | 1877300 | 829200 | 12156 | 337200 | 1010000 | 37600 | 870112 | 141900 |
| 1994 | 2145200 | 2078118 | | 13726 | 371000 | | | 963932 | 185365 |
| 1995 | 1951000 | 1889990 | | 12640 | 363900 | | | 1105067 | 178332 |
| 1996 | 2222400 | 2152903 | | 12698 | 405900 | | | 1124214 | 190547 |
| 1997 | na | na | na | na | na | na | na | 1177764 | 224254 |

(Continued on next page)

Table 1.8 (Continued)

| | <i>Share of domestic market</i> | <i>Value added per employee</i> | <i>Wages to Turnover ratio</i> | <i>Purchases to turnover ratio</i> | <i>Investment turnover ratio</i> | <i>Effective rate of assistance</i> | <i>Nominal rate of assistance</i> | <i>IIT index</i> | <i>Exports to turnover</i> |
|------|---------------------------------|---------------------------------|--------------------------------|------------------------------------|----------------------------------|-------------------------------------|-----------------------------------|------------------|----------------------------|
| | % | \$'000 | % | % | % | % | % | % | % |
| 1979 | 74.7 | 16028 | 24.8 | 62.2 | 2.6 | 38 | 24 | 20 | 2.9 |
| 1980 | 77.4 | 18977 | 23.1 | 61.7 | 2.2 | 38 | 24 | 26 | 3.3 |
| 1981 | 76.9 | 20715 | 22.4 | 60.9 | 1.5 | 33 | 22 | 29 | 4.2 |
| 1982 | 73.6 | 24261 | 22.2 | 63.8 | 2.1 | 33 | 21 | 25 | 4.2 |
| 1983 | 70.2 | 24973 | 23.2 | 59.2 | 1.7 | 32 | 23 | 16 | 2.9 |
| 1984 | 67.2 | 31019 | 21.3 | 58.0 | 1.6 | 32 | 23 | 20 | 4.3 |
| 1985 | 63.5 | 33192 | 22.3 | 56.3 | 1.9 | 32 | 22 | 15 | 3.8 |
| 1986 | | | | | | 34 | 23 | 13 | |
| 1987 | 66.0 | 40233 | 21.0 | 56.3 | | 35 | 23 | 26 | 6.0 |
| 1988 | 65.8 | | 19.5 | | | 32 | 21 | 22 | 5.3 |
| 1989 | 66.7 | | 17.8 | | | 25 | 19 | 20 | 4.4 |
| 1990 | 61.4 | 63415 | 18.9 | 54.1 | 2.8 | 25 | 17 | 18 | 4.9 |
| 1991 | 65.7 | | 18.5 | | | 23 | 17 | 22 | 4.7 |
| 1992 | 63.1 | | 18.2 | | | 19 | 15 | 24 | 6.0 |
| 1993 | 66.6 | 68213 | 17.4 | 52.1 | 1.9 | 17 | 13 | 28 | 6.5 |
| 1994 | 66.3 | | 17.3 | | | 13 | 11 | 32 | 7.8 |
| 1995 | 60.8 | | 18.7 | | | 11 | 9 | 28 | 7.8 |
| 1996 | 63.6 | | 18.3 | | | 9 | 7 | 29 | 7.2 |

^a Excludes re-exports. nc - not collected, na - not available.

Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90) and ABS foreign trade magnetic tapes.

Industry Concentration

Today there are only four firms manufacturing whitegoods in Australia — Email, Fisher & Paykel, Southcorp and St George. After many years of mergers, takeovers and closures, Email and Southcorp have absorbed most of the other manufacturers and brands. However, many of the brands from the 1970s have been retained and still dominate the market today, for example Westinghouse, Kelvinator, Frigidaire, Simpson, and Hoover.

Employment

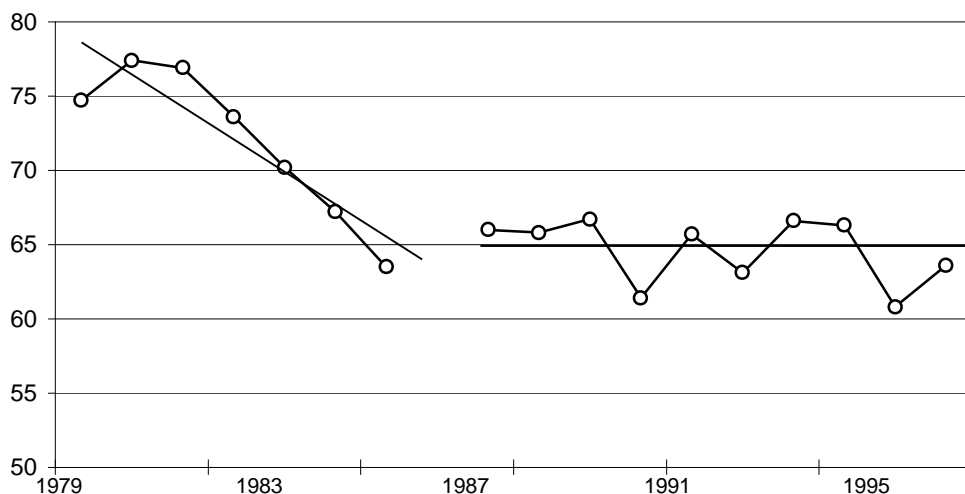
Employment has declined steadily in the whitegoods industry, over the 1980s and 1990s falling from around 22 500 in 1978 to around 12 700 in 1996. Employment has actually increased in recent years after recovering from the economic slowdown in the early 1990s and following the establishment of plants in Brisbane by Fisher & Paykel.

Market shares

The share of the Australian market for appliances (ASIC 3353 and ANZSIC 2851) held by locally manufactured whitegoods has declined from around 75 per cent in 1977-78 to 64 per cent in 1995-96. However, these percentages are distorted by the extent of own importing by the three dominant suppliers. Estimates of the actual share of the market held by the three producers of whitegoods range from 75 per cent to 85 per cent.

Figure 1.8 shows that after a long period of declining market share up until the mid-1980s, locally produced whitegoods have stabilised their market share since then at around 65 per cent.

Figure 1.8 **Australian manufacturing share of domestic market for whitegoods, 1979 to 1996**
Per cent



Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90) and ABS foreign trade magnetic tapes.

One estimate (*Sydney Morning Herald* 13/10/97) shows a breakdown of the Australian market by company as follows: Email 35-40 per cent, Southcorp 25 per cent, Fisher & Paykel 15 per cent and importers 20-25 per cent.

A previous analysis of the market by the SMH (3/1/95) shows shares by product categories held by each producer:

Table 1.9 Australian whitegoods market share analysis (1994)

| | <i>Email</i> | <i>Southcorp</i> | <i>Fisher & Paykel</i> |
|------------------|--------------|------------------|----------------------------|
| | % | % | % |
| Fridges | 55 | 9 | 16 |
| Washers | 30 | 29 | 14 |
| Dryers | 39 | 36 | 20 |
| Air conditioners | 38 | 15 | |
| Electric ranges | 45 | 42 | |
| Gas rangers | 28 | 68 | |

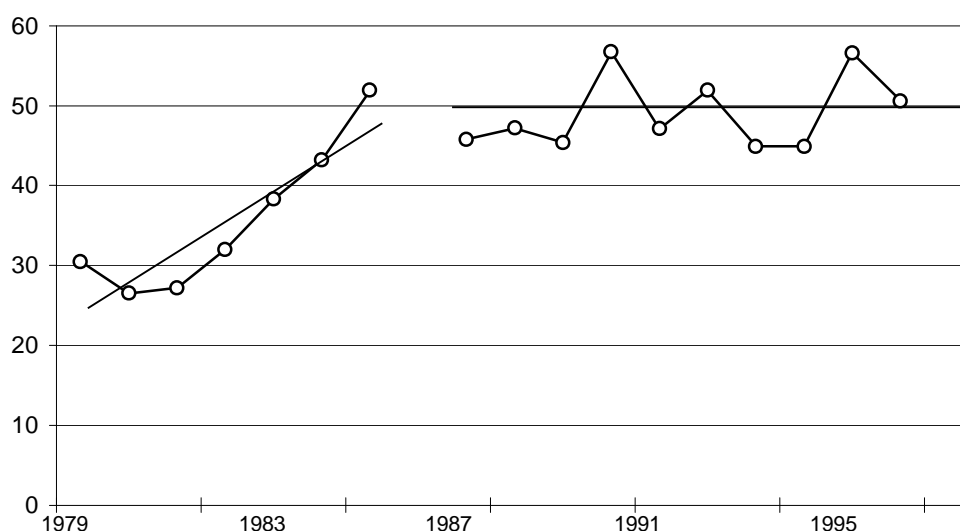
Source: Sydney Morning Herald, 3/1/95.

Imports

The Australian market for whitegoods is now very competitive with aggressive prices being offered by importers, particularly at the bottom end of the market. More than 30 imported brands compete for the retail import market.

Figure 1.9 shows that import penetration increased rapidly over the first half of the 1990s but has since stabilised at around 50 per cent. With Fisher & Paykel now supplying most of its Australian market share from plants in Brisbane, the ratio is expected to fall over the next few years.

Figure 1.9 Imports to Australian whitegoods turnover ratio



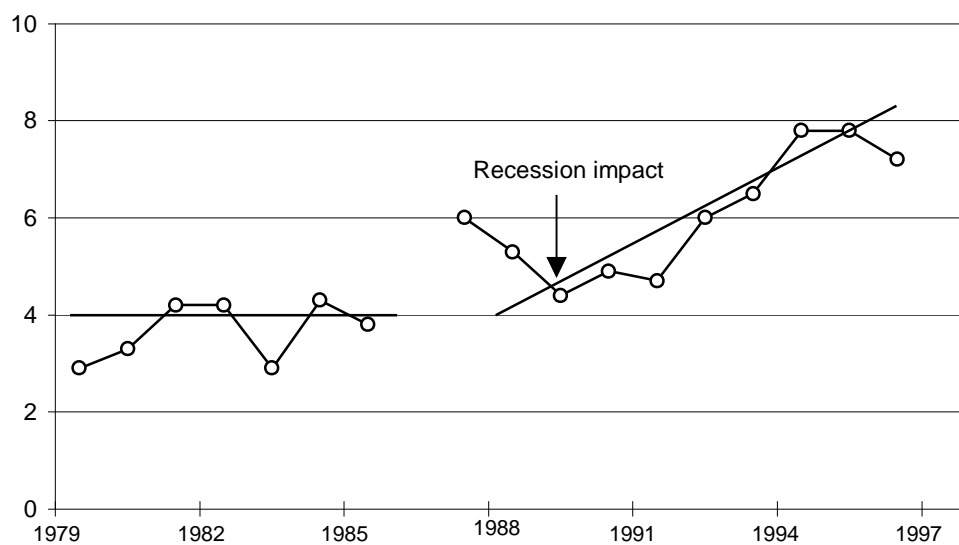
Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90) and ABS foreign trade magnetic tapes.

⁵ Australian manufacturing's share of the turnover based on ANZIC data (~65 per cent) and import penetration (~50 per cent) do not add to 100 per cent because of own importing by manufacturers which is included in turnover.

Exports

Exports have increased significantly since the mid 1980s, particularly to niche markets in the United States and Asia. The export share of sales for the appliance industry has increased from 3 per cent in the mid 1970s to over 7 per cent in 1997.

Figure 1.10 **Exports to Australian whitegoods turnover ratio**
Per cent



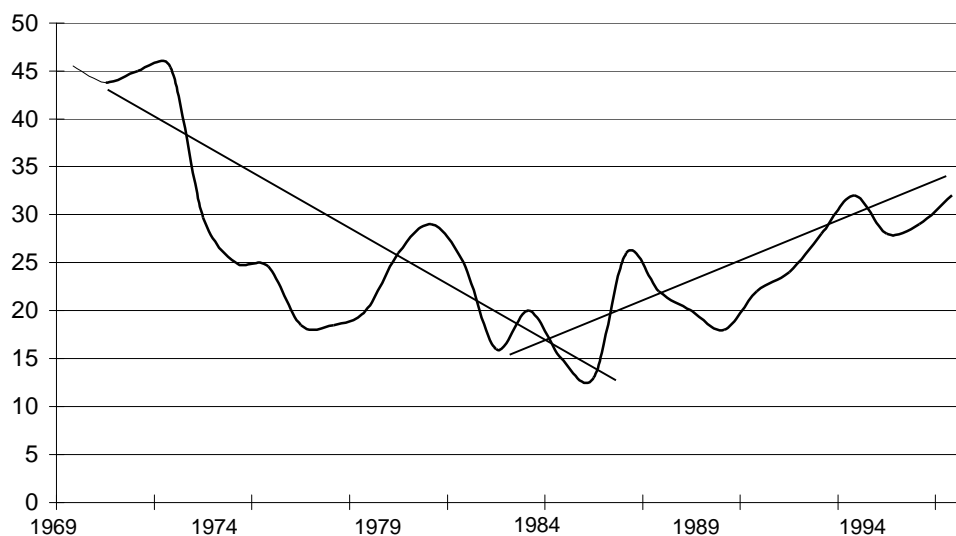
Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90) and ABS foreign trade magnetic tapes.

Intra-Industry Trade

The intra-industry trade index (IIT) index measures two-way trade in similar goods and expresses that trade as a proportion of an industry's total trade. Perfectly balanced trade produces an IIT index of 100, while one way trade (either as imports or exports) in an industry has an IIT of 0. The index is useful for monitoring an industry's changing competitiveness or comparative advantage and is often used as an indicator of changing specialisation with an industry.

The IIT index for the appliances (ASIC 3353 and ANZSIC 2851) has increased significantly from a low of 18.5 in 1977-78 to 32 in 1996-97. This is still low by international standards, but reflects certain features of the Australian market, including the high share of the market held by local producers because of strong brand loyalties by Australian consumers. The substantial increase in the IIT since the mid-1980s is due largely to the significant increase in exports.

Figure 1.11 Intra-industry trade index for whitegoods



Data source: ABS 8221.0 and ABS trade data.

Input Costs

The ratio of wages and purchases to turnover for appliances has declined significantly over the period under review from a high 86 per cent in the mid-1970s to just under 70 per cent in 1992-93, the last year information on purchases was collected. This change suggests increasing returns to capital and/or debt relative to labour. The share of purchases (such as components and raw materials) rose from 60 per cent to a high of 64 per cent of turnover in 1981-82 and has since fallen to 52 per cent in 1992-93. The share of turnover held by wages dropped from 26 per cent in the mid-1970s to 18 per cent in 1995-96. These declines have closely shadowed changes in the same ratios applying to the manufacturing sector generally.

Productivity

Productivity measures the impact of the industry's strategies for pursuing world best practice in production, distribution and after sales services of the whitegoods under consideration. Productivity within the community generally is improving continuously. For example, in recent decades Australian multifactor productivity has grown at an annual average rate of about 1.5 per cent - although during the 1990s, it has been growing at a faster rate.

Table 1.10 shows value added per person in constant dollars for whitegoods and for all manufacturing over the period since 1976.

Table 1.10 Value added^a per person employed in whitegoods and in all Manufacturing
Constant \$'000

| <i>Year</i> | <i>Whitegoods</i> | <i>All manufacturing</i> |
|-------------|-------------------|--------------------------|
| 1976 | 22.0 | 36.1 |
| 1977 | 24.2 | 37.7 |
| 1978 | 24.7 | 40.5 |
| 1979 | 26.0 | 39.2 |
| 1980 | 29.6 | 42.4 |
| 1981 | 30.0 | 42.7 |
| 1982 | 33.1 | 43.4 |
| 1983 | 32.8 | 43.1 |
| 1984 | 39.6 | 46.6 |
| 1985 | 42.2 | 49.0 |
| 1986 | | |
| 1987 | 45.3 | 51.1 |
| 1988 | | |
| 1989 | | |
| 1990 | 63.4 | 61.9 |
| 1991 | | |
| 1992 | | |
| 1993 | 65.5 | 65.6 |
| 1994 | | |
| 1995 | | |

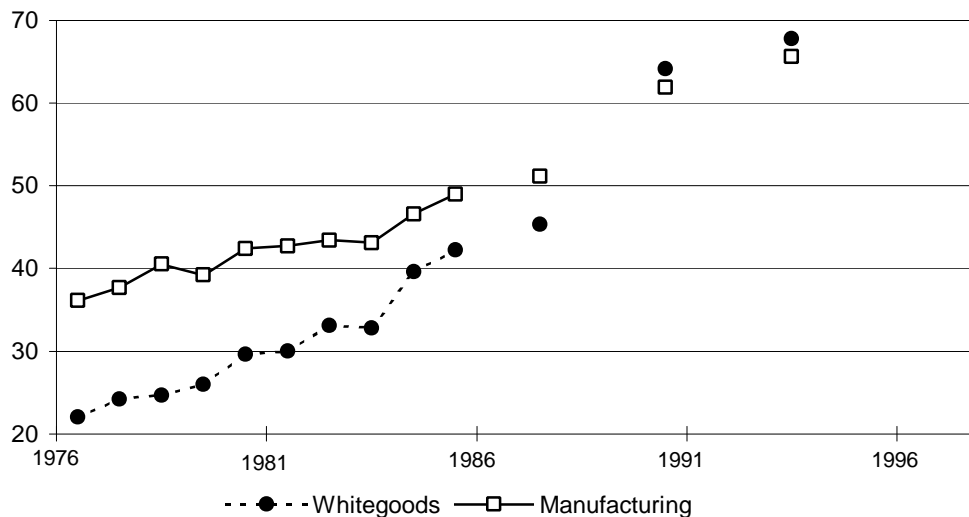
^a Value added has been deflated by the CPI component for household appliances (base year 1989-90) in the case of whitegoods and by the Index of Articles Produced (base year 1988-89) in the case of manufacturing.

Data Source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90).

This data is shown graphically in figure 1.12.

It indicates that productivity growth in whitegoods started well below that of all manufacturing up to around the mid-1980s but has since improved substantially to be level pegging by 1993.

Figure 1.12 Value added per person employed in whitegoods and in All manufacturing
Constant \$'000



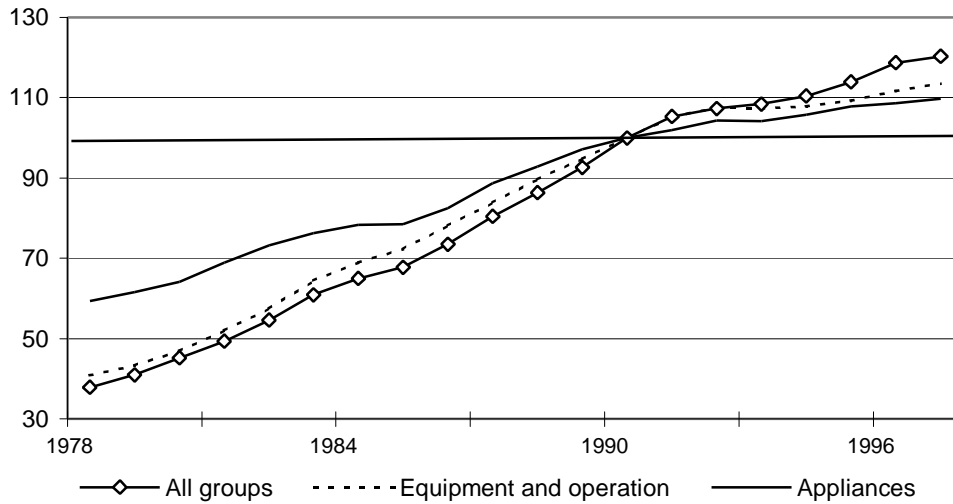
Data source: ABS 8203.3 (prior to 1989) and 8221.0 (from 1989-90).

Prices

Until around 1990-91, the Consumer Price Index (CPI) component for *household appliances* (which is mostly whitegoods) was consistently higher than for *household equipment and operation* and for the *all groups* CPI. Since that time, price movements in *household appliances* have slipped below movements in the prices of the other two components.

Given the relatively high import tariffs for whitegoods at the beginning of the 1980s, it would be reasonable to conclude that subsequent tariff reductions and consequential structural and market changes were a major contributing factor to the relative price performance of whitegoods as shown in figure 1.13.

Figure 1.13 Movements in prices for selected CPI groups

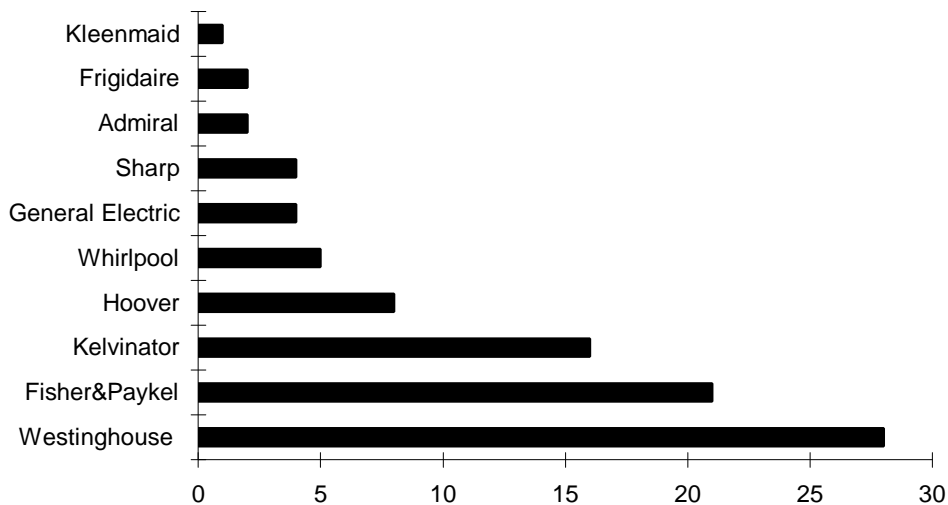


Data source: ABS 6401.0.

Quality

All manufacturers have similar strategies for delivering market share and profit growth - namely the pursuit of world best-practice, innovation, high levels of product quality and customer service. It is difficult to assess the level of quality of locally produced whitegoods. However, the loyalty shown by consumers towards local brands suggests that buyers are satisfied with the quality of local whitegoods. This is supported by recent consumer surveyson preferred brands as shown in figure 1.14.

Figure 1.14 Refrigerator brands bought last year
Percentage of consumers



Source: Roy Morgan Research in *Counterpoint*, April 1988 [9], p. 26.

Choice for Consumers

Opening up the market to competition has led to a much wider choice of brands for the Australian consumer. Listed below is an extensive but not exhaustive list of the major brands currently being sold on the Australian market.

Table 1.11 **Choice of brands**

| <i>Refrigerators and freezers</i> | <i>Clothes washers and dryers</i> | <i>Dishwashers</i> | <i>Ovens</i> | <i>Stoves and cooktops</i> |
|-----------------------------------|-----------------------------------|--------------------|-----------------|----------------------------|
| Admiral | AEG | AEG | AEG | Bosch |
| Amana | Americana | Asko Asea | Andi | Chef |
| Americana | Bendix | Bauknecht | Ariston | Fisher & Paykel |
| Fisher & Paykel | Bosch | Blanco | Blanco | Ilve |
| Fujitsu General | Fisher & Paykel | Bosch | Bosch | Miele |
| Goldstar | Frigidaire | Fisher & Paykel | Chef | Nardi |
| Hitachi | General Electric | General Electric | Eurolec | Omega |
| Hoover | Hitachi | Kleenmaid | Finesse | Scholtes |
| Kelvinator | Hoover | Lemair | Fisher & Paykel | Simpson |
| Lemair | Whirlpool | Miele | Gaaggenau | SMEG |
| NEC | Ignis | Omega | Kleenmaid | St George |
| Norge | Kleenmaid | Simpson | Miele | Westinghouse |
| Samsung | Maytag | SMEG | Omega | Whirlpool |
| Sharp | Miele | Vulcan Dishlex | Scholtes | |
| SMEG | Omega | Westinghouse | Simpson | |
| Westinghouse | Panasonic | | SMEG | |
| | Samsung | | St George | |
| | Sanyo | | Westinghouse | |
| | Sharp | | Whirlpool | |
| | Simpson | | | |
| | Westinghouse | | | |
| | Sanyo | | | |

1.5 Conclusions

The aim of MER is to contribute to a more productive economy. In manufacturing industries, MER works by improving production efficiency. Production efficiency is about turning inputs into outputs at lowest manufacturing unit cost given constraints on plant size. It is affected by a whole host of factors including the type of production technology used; flow management of materials, the manufacturing process and stock handling; capacity utilisation; and the extent of product and plant specialisation.

There are two main market drivers that continuously force improvements in production efficiency – demands from shareholders for improved profit

performance and competitive pressures from other whitegoods suppliers. Government regulation for non-economic reasons such as public safety or environmental control can also force changes in the organisation of production. Although possibly justifiable on the basis of public costs and benefits, such regulation can change production organisation from what it might have been in the absence of regulation. Thus regulation will usually be counter-productive to plant efficiency and consequent private costs.

It is not possible to isolate out the causative impact of MER from other drivers affecting the organisation of production in whitegoods. But there are some strong correlations that are difficult to ignore. Market price pressures from general tariff reductions and free trade with New Zealand under the CER have been associated with plant rationalisation and increased specialisation of manufacture. Production volumes of whitegoods have increased over the last 20 years but the labour required has almost been halved. By most standards, that represents a substantial reorganisation of production.

Mutual recognition agreements will provide for Australian and New Zealand manufactured products to be sold in each others markets, in Europe and within APEC countries without any alteration in product design. That allows longer production runs for models and better amortisation of fixed costs. Widespread acceptance of international standards is having a similar effect.

However, Government regulation has imposed some additional production organisation costs. Energy labelling, minimum energy performance standards and the ban on the use of CFCs have forced changes not only on product design but also on product mix and manufacturing methods. It is too early yet to see the impact of other forms of MER but the expectation would be positive. Reforms in transport and energy utilities for example mean that production decision-makers face new sets of prices which reflect more the true costs of providing those services.

Technology and plant flexibility are now considered far more important to competitiveness in whitegoods manufacturing than plant size. All the operational functions of whitegoods from materials through to manufacture to stock to distribution are all controlled using computer technology. No longer do changes in model designs or even a number of different models being simultaneously produced involve long down time for tooling change-over. The concept of minimum efficient plant size for whitegoods is still appropriate. But the size of existing plants in Australian/New Zealand is not regarded by the industry as a competitive impediment.

Competitive markets can force compositional changes in an industry's structure – more productive plants increase their share of production while less competitive

plants contract. At least five whitegoods manufacturing plants have closed over the last 20 years as part of the general rationalisation of the industry. Some of these closures would have happened even in the absence of MER because other manufacturers and importers were exerting competitive pressures on the least efficient plants. In other cases, excess plant capacity resulting from company acquisitions was closed down. Arguably, MER was a contributing factor in bringing the timing of those acquisitions forward resulting in earlier technical efficiency gains than may have been the case otherwise.

Management practices are perhaps the most important driver of productivity at the firm level. Such practices determine whether an individual firm will be an innovator, form strategic linkages with other firms, adopt new technology, introduce inclusive work practices, learn internally and be able to process the knowledge it gains from customers and competitors to improve its relative market share.

The public position of whitegoods management expressed in various submissions to Government over the late 1970s and for much of the 1980s appeared inwardly focused and defensive. Maintaining tariff assistance was regarded as an essential element to continued viability. When the inexorable direction of MER trade reforms became clear by the mid-1980s, to its credit, management responded. Far-reaching decisions were taken to aggressively compete for market share. Email, Hoover and later Southcorp successively sought strategic acquisitions. Considerable investment went into modernising manufacturing operations. Product designs were improved and export markets developed. The consequent loss of around 1000 jobs was handled well by management with little, if any, industrial disputation.

MER cannot directly change management practices. It is the way that management responds to MER that determines the outcomes from the process. By internationalising the whitegoods industry, trade reforms in particular put pressure on management to take strategic decisions. There is sufficient evidence to suggest that management practices were able to respond in a manner that resulted in technical gains from improved productivity.

Inter-jurisdictional MER and other general reforms in GBEs, labour markets and infrastructure generally make the decision-making process easier for management by removing inconsistencies in Government legislation and improving choice. Although the technical gains here are probably small, they would still be of value to the whitegoods industry.

MER in the form of enterprise bargaining and workplace agreements has greatly changed the industrial relations system in Australia. Under the previous centralised system of wages determination, there was little flexibility for firms to relate wage

levels and conditions to the rate of growth of labour productivity in their plants, to the state of the markets into which they sell, or to their ability to pay.

Email, Southcorp and Fisher & Paykel all have site by site enterprise bargaining agreements in place which provide for employees and management to negotiate on specific issues such as wage levels, labour productivity, working times and skill requirements. The agreements also allow for emphasis to be placed on customer satisfaction, training, employee relations and quality to ensure that all staff have the necessary skills and competencies required to successfully meet both competition and corporate performance targets.

Prior to the trade reforms of the 1980s and 1990s, the whitegoods industry was an oligopoly whose profitability was supported by Government regulation in the form of relatively high import barriers that limited the capacity of importers to enter the market. Although rivalry between the firms was open and conscious there existed a strong degree of product differentiation by brand name which remains today.

Although takeovers and mergers have tended to entrench the oligopolistic structure of local whitegoods manufacturing, the trade related MER reforms have reduced barriers to market entry. This resulted in not only an increase in the number of actual importers in the market but it also removed a major regulatory impediment to potential entrants. Threat of new entrants into a market is a significant factor in influencing actual competitive conduct.

Removing barriers to market entry would be expected to typically result in lower prices and more choice for consumers and this has been the observed outcome in the whitegoods market. The CPI component for whitegoods has grown at much less than the rate for both household goods and services generally and for the “all groups” index. There is a wide choice of products being offered to consumers from a large number of suppliers. This evidence suggests a strong link between MER and dynamic gains resulting from lower prices and greater choice, both of which increase consumer surplus.

MER has also introduced more competition in the services used by the whitegoods industry such as electricity, transport and Government. By reducing input costs, this MER allows the industry to appropriate some consequential dynamic efficiency gains which in turn may be passed on to consumers.

However, some technical regulation imposed on the industry has had the opposite effect. By ruling out lower quality products, mandatory minimum standards may result in under consumption of some whitegoods relative to the socially desirable level. Energy labelling, although not mandatory, works through a form of moral suasion on manufacturers and produces the same negative effect on

consumer surplus. Such regulation restricts supply with consequent increases in costs and prices above those that may result in a fully competitive market. These static losses inevitably lead to dynamic losses in efficiency over time because market supplies become influenced by product regulation. Incentives for cost efficiencies and innovation by suppliers are reduced.

There may well be externalities resulting from use of relatively less energy efficient appliances but the case for regulation does not appear to have been made on that basis. Certainly in economic terms, product regulation of whitegoods, by reducing available choice and imposing costs on suppliers, results in clear losses in dynamic efficiency.

Innovation is a major driver of productivity through its influence on development of new products or processes (technological innovation) and changed management/organisational practices (non-technological innovation). Both forms of innovation affect a firm's ability to create and maintain competitive positions.

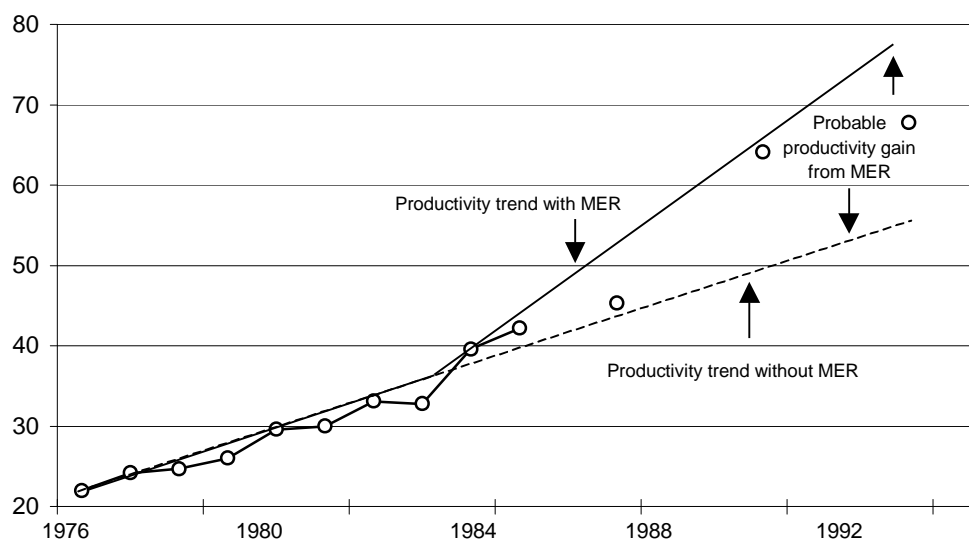
The basic technology embodied in most whitegoods has changed little over the last 20 years, both locally and internationally. Some electronics have been incorporated and product designs have generally been improved. It is probably fair to assert that most ideas for innovation in whitegoods are generated from within the firm. It is in the production processes of whitegoods where innovation has been strongest. However, product innovation has been forced upon the industry through regulation, particularly the ban on use of CFCs, which led to changes in compressor technology in refrigerators and in types of foam insulation.

Overall, any MER related dynamic efficiency gains from innovation and new technology in the whitegoods industry have been mostly from indirect influences of competitive market pressures.

Tariff reductions, CER, labour market flexibility, mutual recognition agreements, common international standards, inter-jurisdictional reforms all contributed to a more conducive framework for encouraging productivity growth in the Australian whitegoods industry. These measures also coincided with other fundamental changes such as financial market deregulation and the floating of the dollar. It is impossible to accurately ascribe an incremental growth in productivity solely to MER. But there is no doubt that there have been some significant turning points in the productivity performance of the Australian whitegoods industry which have been driven by competitive MER pressure. The allocative, technical and dynamic efficiency gains associated with this improvement occurred faster and probably to a greater extent than would have been the case in the absence of MER.

Buyers of Australian whitegoods have benefited from MER. There is a wider choice of brands on the market and competitive pressure has ensured that the rate of price increase for whitegoods has been less than the CPI generally.

Figure 1.15 Value added per person in whitegoods



2 Automotive industry

The 1970s and early 1980s brought considerable change and uncertainty to automotive industries around the world. Demand growth slowed in most major markets, largely as a result of increased fuel prices and generally depressed economic activity. There was also a marked shift in demand towards smaller vehicles. Technological change in both vehicle design and manufacturing was also significant. International trade in vehicles and components increased and competition intensified. Most automotive industries overseas responded to the challenge of changing market circumstances by significant restructuring. But, in Australia, the automotive industry continually sought and received government assistance to compete against imports and thereby reduced the force of adjustment pressures.

A change in government policy in the mid- to late 1980s initiated significant reductions in protection which continued in the 1990s. This case study examines the responses of the industry to these changes and the productivity outcomes. It draws heavily on information provided in reports of the Industries Assistance Commission and the Industry Commission on the industry.

2.1 An overview of the development of the automotive industry

The Australian automotive manufacturing industry comprises both component and vehicle production. It is one of Australia's major manufacturing activities and accounts for about seven per cent of total manufacturing value added and about one per cent of GDP.

The industry consists of many diverse firms from large multi-nationals to small private firms involved in innovative niches such as vehicle design. Large volume operations exploiting economies of specialisation and scale have been a feature of successful producers internationally.

Australia is a small player in a large global industry. As a small player the Australian industry is significantly influenced by international developments. For example, the four car manufacturers in Australia are subsidiaries of multinational

organisations and, as such, are subject to the adjustments in the global strategies of their parent companies.

Passenger motor vehicle (PMV) production can be divided into four segments, small/light/micro, medium, upper medium and luxury. In Australia, PMV production is currently centred on the upper medium segment. Ford and Holden dominate with production of the Ford Falcon and the Holden Commodore. Mitsubishi and Toyota have also moved into this market segment with production of the six cylinder Magnas and Camrys respectively. In addition to PMV manufacturing, there is also a significant commercial vehicle sector. Light commercial vehicles (LCVs) account for around 90 per cent of commercial vehicle sales. Most locally-produced light commercial vehicles are utilities. However, all segments of the LCV market are dominated by imports, of which 4WD vehicles make up a significant proportion. No 4WD or very small vehicles are produced in Australia.

The component manufacturing sector in Australia is also a significant part of the automotive industry. In 1996, there were almost 200 firms in Australia supplying components to passenger vehicle producers, with 35 firms producing around 75 per cent of the value of Australian component production. The majority of the largest component manufacturers are not wholly dedicated to the motor industry. Several of the largest component manufacturers are groups of subsidiary businesses, such as BTR Nylex and Pacific BBA. In addition, major components such as engines and castings are produced in-house by the vehicle assemblers.

The Australian automotive industry has strong links to other industries. It is a large purchaser which contributes to the use of technology and skill levels across the economy. For example, the motor vehicle industry is the single largest purchaser of products from the rubber and furniture and mattresses sectors of the economy, the second largest purchaser of basic iron and steel products and the third largest purchaser of paints. The automotive industry is a significant user of advanced technologies which are associated with design and engineering, production, material handling, inspection and testing processes and communications.

The industry has a long history of government assistance. The first tariffs were introduced in the early part of this century. Tariffs and certain discriminatory measures were among the factors that encouraged the growth of the local components industry during the 1920s and 1930s. In the 1950s, the government extended its commitment to the complete manufacture of PMVs in Australia. Assistance provided included both tariff and non-tariff measures such as concessional loans, local content arrangements and import licences. In the mid-

1960s, the first of a series of Motor Vehicle Plans was introduced to promote higher levels of local content.

During the 1970s and 1980s, the Australian industry faced increasing competition as overseas industries, especially from Japan. Australian producers sought and gained large increases in government assistance to avoid adjustment. The vehicle market was protected by market sharing and quantitative import restrictions and component producers by the vehicle manufacturing plans.

Table 2.1 indicates that by the mid-1980s, the industry was in receipt of very high assistance. Total value added, employment and domestic market share had declined even further despite the additional assistance. Export intensity had changed little and labour productivity improvement was slow.

Table 2.1 Selected indicators for the automotive industry, 1974-75, 1984-85, 1995-96

| | 1974-75 | 1984-85 | 1995-96 |
|--|---------|---------|---------|
| Value added ^a (\$m) | 3 516 | 3 271 | 4 495 |
| Employment (no.) | 80 238 | 63 600 | 47 552 |
| Domestic market share ^b (%) | 69 | 61 | 56 |
| Export intensity ^c (%) | 5 | 6 | 12 |
| Value added ^a per employee (\$) | 43 815 | 51 425 | 94 530 |
| Capital labour ratio ^{ad} (\$/employee) | 42 273 | 59 886 | 95 134 |
| Effective rate of assistance (%) | 50 | 138 | 31 |

^a 1989-90 prices. ^b Market share is defined as sales of domestically produced goods less exports, as a proportion sales of domestically produced goods less exports plus imports and duty paid on imports. ^c Exports as a percentage of turnover. ^d Capital to labour ratio is measured as the net capital stock per employee. The capital labour ratio is measured for the subdivision transport equipment.

Source: Commission estimates based on ABS data.

Since the mid-1980s, there has been significant changes to the automotive industry. Value added has increased in real terms, although employment and domestic market share continued to fall. Labour productivity improved considerably over the decade. The capital labour ratio for the transport equipment industry subdivision also increased considerably. Automotive exports as a proportion of turnover doubled over the last decade, increasing from 6 per cent in 1984-85 to 12 per cent in 1995-96, and increasing further to 16 per cent in 1996-97. This has been against the backdrop of declining levels of assistance, with the effective rate of assistance falling from 138 per cent in 1984-85 to 31 per cent in 1995-96.

Over this period, there was also considerable rationalisation in the industry. Nissan stopped production in 1992, leaving the number of assemblers at four. PMV

manufacturers have also rationalised the number of models from 13 to 5, with vehicle production in Australia becoming more concentrated in the medium/large end of the market. The number of car models available to Australians has increased, from 69 in the mid-1980s to 101 in 1995-96.

Many component producers are now internationally competitive and successful in export markets. Most assemblers have also improved their export performance.

2.2 Factors affecting the industry

Many factors have influenced the performance of Australia's automotive industry. They include global changes in the automotive industry, technological change, changes in consumer tastes, changes in the exchange rate and change in government policy.

Global pressures

Two major developments since the mid-1970s were increasing competition from Japan and some newly industrialising countries and increasing international integration of production.

During the 1980s, vehicle production expanded in a number of developing countries such as Brazil, South Korea and Mexico. Lower production and investment costs together with government assistance in some of these countries were the major factors contributing to this growth. Apart from vehicle exports marketed directly by producers in these developing countries, there was significant sourcing of vehicles and parts from them by producers in developed countries.

This increase in competition placed pressures on the big vehicle manufacturers of the USA and Western Europe. These producers responded to the changed market circumstances by substantially rationalising and further concentrating firms and production facilities. There was merger activity and co-operation between firms both nationally and internationally.

During the 1980s, world production capacity was increased by the establishment of several new, more modern facilities by various producers to incorporate new technologies and accommodate changing consumer requirements. It resulted in excess production capacity and greater intensity of competition between producers.

Increasing globalisation of the automotive industry has occurred over the past two decades. The major firms have developed internationally integrated production and

marketing strategies to reduce costs and increase competitiveness. Automobile manufacturers now market a range of models sourced from various countries. They build the same model in different countries, sourcing components from suppliers who might produce them in more than one location. Intra-firm and inter-firm arrangements generally span many markets.

Mergers and capital linkages between producers in different countries played a major role in the globalisation of the industry. There has also been a substantial expansion of joint ventures to share the costs of product and technology development and licensing agreements. One of the most important developments has been the expansion of regional and global design whereby firms use a common model platform and produce different variants for different markets.

As a result of these developments, the international automotive industry now has a high degree of integration both within and between firms.

Technology

The Australian automotive industry has traditionally relied heavily on imported technology, partly because most firms can obtain technology at relatively low cost from overseas. With many multinationals present in the industry, local subsidiaries have access to their parent's technology.

Before 1970, most technological innovation focused on improving product performance while preserving existing manufacturing plants and processes. Rising fuel prices and emission control regulations, however, required technological innovation which placed new demands on the design and performance of motor vehicles in the 1970s. Examples of major innovations widely adopted over the 1970s and 1980s include front wheel drive axles, turbo charging, electronic engine controls and diagnostics, and widespread substitution of materials.

Technological innovation of the production process has also proceeded at a rapid rate. Robots, programmable controllers, computer-aided design and manufacturing, lasers and other advanced technologies are increasingly used in vehicle and parts production overseas. Welding and painting processes have been largely automated in modern overseas plants. The major firms are increasing automation of final assembly.

Increasingly the focus of technological development in the industry is on flexible manufacturing systems. The trend is to create more versatile factories by utilising machines and systems which are flexible enough to produce a greater variety of models, and even different cars, on the same production line. The cost of one

factory can then be spread across five or ten cars, thus lowering fixed costs and the costs of models or cars which fail in the market.

Management and work practices

A feature of the development of the global automotive industry has been the introduction of lean production techniques initiated by Japanese producers as a way of reducing costs. There are three essential elements of lean production: human resource systems, work systems and factory practice. The goal is to reduce waste of resources and effort and strive for continual improvement. The introduction of these new management and work practices was associated with industrial relations reforms and award restructuring.

Lean production methods involve better inventory management systems such as just-in-time production and delivery, re-organising work practices to minimise production downtime, working in teams with a degree of worker responsibility for product quality and the process of allocating work tasks and continual improvement of product quality.

The old organisational structure, which imposed strong control from the top of the production process, was gradually replaced by an approach that relied extensively on group problem-solving at all levels. Under the former approach, major decisions regarding productivity were made by management and usually implemented at the time of model change. By contrast, a group problem solving approach to plant management is based on the idea that much of the potential innovation in the production process is incremental, and that many small changes are more likely to improve productivity in the long run than are major changes introduced only at model change overs (BIE 1986, p. 40).

Changes in demand

Consumer demand patterns have influenced the development of the automotive industry in Australia. Passenger vehicles are a highly differentiated product and the ability of producers to supply vehicles of an acceptable design and quality is important. Factors such as brand loyalty, after sales service and the availability of spare parts in part determine competitiveness in the market.

During the 1970s, demand for passenger vehicles shifted towards four cylinder engine vehicles as these were more fuel efficient. In response to this shift, the share of four cylinder engines in total local production increased. Prior to 1975 these

vehicles accounted for less than 40 per cent of local production. In 1980, the share had increased to more than 60 per cent (IAC 1981, p. 49).

In the 1990s, there were significant changes in consumers' tastes and preferences. Demand for upper medium vehicles was strong. There was also high demand for micro/light vehicles which drove the development of a new class within the small vehicle segment of the market.

Fleet sales are an important source of sales of domestic PMV producers. This has been the case historically. In 1996, each local model relied on government and private vehicle fleet purchases for over 50 per cent of their sales. The upper medium segment relies on fleet sales more than other segments.

Exchange rate movements

Exchange rate movements affect the competitiveness of industries in the short term. However, after Australia shifted from a system of fixed exchange rates to a floating exchange rate regime there was a long term decline in Australia's trade weighted index.

The depreciation of the Australian dollar in the mid-1980s significantly improved the competitiveness of the Australian automotive industry as reflected in a decline in measured assistance. This was brought out by the significant decline in the tender premiums for motor vehicle quotas between 1986 and 1988. The available quota pool was not cleared by tender during these years, thus making quota protection redundant (IC 1995a, p. 79). However, local producers were cushioned from some of the effects of the depreciation on input costs through the use of a lagged exchange rate to value imported content for the purposes of the local content arrangements (IAC 1986a, p. 46).

The depreciation of the dollar made it easier for the government to bring forward the abolition of import quotas. In addition, the depreciation also improved the competitiveness of Australia's automotive exports.

Government policy

Government policies have exercised a strong influence on the development of the automotive industry in Australia. The main influences have been assistance arrangements, government purchasing policies, regulation and the industrial relations framework.

Industry assistance

Successive governments have implemented a variety of assistance packages for the automotive industry. By the early 1980s, the industry had become one of Australia's most highly assisted industries, supported by a variety of assistance arrangements which automatically increased assistance when the industry's competitiveness declined. From the mid-1970s to the mid-1980s, the effective rate of assistance increased from about 50 to almost 140 per cent (figure 2.1)¹. In the first half of the 1980s, the effective rate of assistance for motor vehicle production was in excess of 250 per cent (IC 1995a, p. 205). The industry was supported by tariffs, an 80/20 market sharing arrangement enforced through import quotas, export assistance, a local content scheme, and import tariff relief on a proportion of imported components.

Government policy changed in 1984 in recognition of the failure of previous policies to develop a viable internationally competitive industry. New assistance arrangements were introduced by the Button Car Plan. The 80/20 market sharing arrangement was replaced with tariff quotas with a penalty duty of 100 per cent for out-of-quota imports. The tariff quotas were scheduled to phase out by 1992 with the penalty duty to be set at 57.5 per cent in 1992, equal to the general tariff for imports inside the quota thus rendering the quota redundant. The local content scheme and an entitlement to import 15 per cent of their value of production duty free were retained, access to export facilitation was increased and tariff quotas were extended to certain light commercial and four-wheel drive vehicles. The government expressed a desire to see an industry structure by 1992 of no more than three manufacturing entities producing six models at most.

Changes to the Plan were precipitated by the substantial depreciation of the Australian dollar in 1985 and 1986, which significantly reduced the adjustment pressure on the industry. In 1986, restrictions on the duty free entitlement under the local content scheme were introduced to penalise low volume production. In 1988, import quotas were abolished and tariffs reduced immediately to 45 per cent, phasing down to 35 per cent by 1992. In 1989, the local content scheme was abolished. In 1993, further tariff reductions commenced with tariffs on motor vehicles and components set to decline to 15 per cent by 2000.

In 1997, the Government announced that tariffs would remain at 15 per cent for five years from 2000 and reduce to 10 per cent in 2005. In 1998, it was announced that an Automotive Competitiveness and Investment Scheme would operate from 2001

¹ Measured on a different basis, the effective rates of assistance were even much higher. For example, assistance for the automotive industry was measured at over 250 per cent (see IC (1997b), pp. 223-60).

for five years. Under this arrangement, PMV producers are to receive an increased in the duty free allowance on imports from 15 to 25 per cent of a broader definition of the value of production and an investment benefit of 10 per cent of a three year moving average of investment in new assets. Component producers and other eligible participants will receive an investment benefit of 25 per cent of the investment in new capital assets and 45 per cent of the value of investment in R&D, with both values calculated on a three year moving average.

The Export Facilitation Scheme currently allows vehicle and component producers to earn export credits in return for automotive exports and to use these credits to offset the duty on their imports. Total duty foregone under the scheme is estimated at about \$160 million per annum (IC 1997b, p. 221). Inputs used in the production of vehicle and component exports are imported duty free. The Export Facilitation Scheme is due to expire in 2000 and is to be replaced by the Automotive Competitiveness and Investment Scheme.

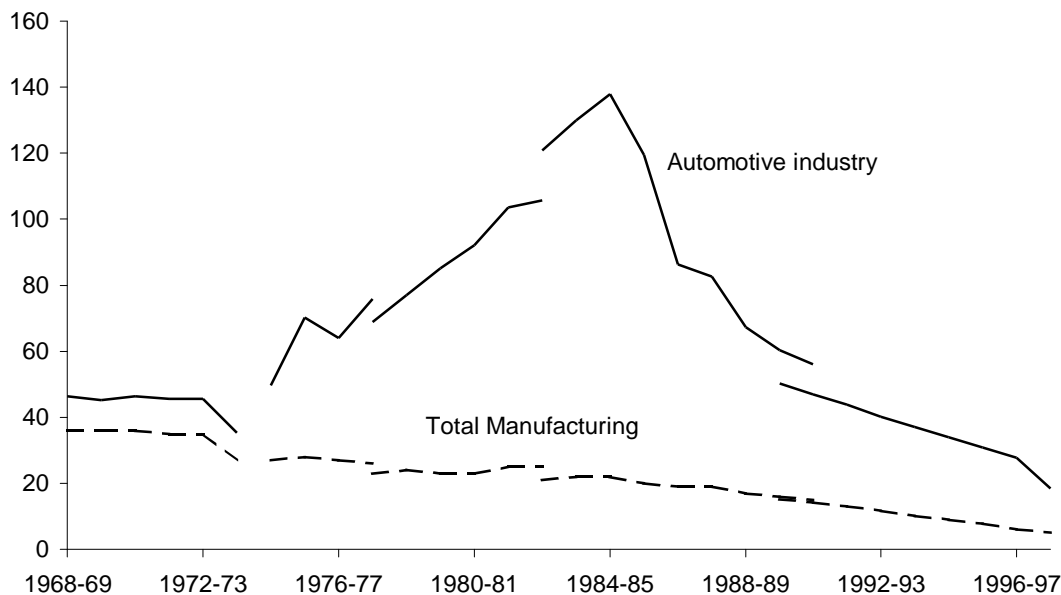
The automotive industry also receives assistance from a range of generally available industry assistance programs provided by the Commonwealth Government. These mostly relate to research and development and exporting activity. The amount of assistance provided to the industry through these programs is around \$60 million a year, or about 8 per cent of the industry specific assistance accorded the industry (IC 1997b, p. 221). The industry also receives State government assistance in the jurisdictions where it operates.

The level of assistance to the automotive industry has declined markedly since the introduction of the Button Plan (figure 2.1). The effective rate of assistance fell from a peak of about 140 per cent in 1984-85 to 28 per cent in 1995 and it is estimated that it will be 19 per cent in 2000. The fall in the effective rate in 1985-86 reflects a fall in the tender premiums for quotas as a result of the depreciation of the Australian dollar. Even though measured assistance declined due to the drop in tender premiums, the depreciation of the Australian dollar provided a temporary buffer as imports became relatively more expensive.

Despite the absolute fall in effective rates, relative levels of assistance for the automotive industry increased during the 1990s. For instance, in 1989-90, the effective rate of assistance for the industry was three and a half times that for the manufacturing sector, or 37 percentage points difference, and by 1996-97 it was nearly five times that for manufacturing, or 22 percentage points (IC 1995a, p205, 207, PC 1998a).

Figure 2.1 Effective rates of assistance for the automotive industry and total manufacturing, 1968-69 to 1997-98

Per cent



Source: IC (1995a).

Regulations

Australian Design Rules (ADRs) govern three main areas: vehicle safety, environmental standards concerning emissions and noise, and some highly specific regulations aimed at discouraging vehicle theft. There are also differences in the ways that ADRs are applied in individual States and Territories. ADRs also impact on specific automotive components. Progress has been made to harmonise ADRs with standards applying in major overseas countries.

The existence of ADRs differing from those in supplying countries may change the distribution of imports by discouraging low volume imports. This is because to comply with ADRs, overseas producers have to make special components for relatively small volume sales to Australia.

Participants in the industry have argued that the lack of uniformity of ADRs with international standards and non-uniformities in their application within Australia impose a cost penalty on firms in the industry and ultimately on car consumers. Some vehicle importers have argued that the cost per vehicle of complying with unique ADRs was greater for imports than for local manufacturers with a consequence that de-facto protection was provided to the local industry. Compliance with non-uniform environmental regulations and standards adds to the

costs incurred by manufacturers. For example, scale economies can be lost when smaller production runs are necessary to meet different standards (BIE 1996, p. 24).

Industrial relations

The Australian industrial relations system has been built around a centralised system for fixing wages and conditions. The disadvantage of such a process is that productivity at the enterprise level may not reflect the wages outcomes for an enterprise. Wages outcomes may not reflect the capacity to pay which is related in part to productivity performance. In the late 1980s, a system was introduced, under which responsibility for determining terms and conditions of employment could be shifted to the work place level by the establishment of enterprise agreements — with the agreements underpinned by an award safety net. The introduction of the Workplace Relations Act would help facilitate increased flexibility and a shift to closer worker-employer relations (IC 1997b, p. 146).

Other factors continuing to restrict productivity within the industrial relations system include the complexity of the award system, the maintenance of award conditions, pattern bargaining within the automotive industry, and restrictive work practices.

The complexity of the industrial relations system potentially impedes productivity within the automotive industry. The award regulates working arrangements at the enterprise level in a prescriptive way. It covers issues such as hours of work, pay conditions, overtime shift rates, leave conditions, safety checks to tools and work area, special conditions for watchmen and gatekeepers, tea breaks and training requirements. Many companies within the automotive industry are covered by multiple awards. This means unions may be focused on industry-wide or occupational issues, rather than achieving the best outcome within a particular firm. (IC 1997b, p. 148)

The maintenance of award conditions may inhibit the achievement of the flexibility necessary for the automotive industry to become internationally competitive. While positive change has occurred, some employers saw the enterprise bargaining process as a means of accruing additional remuneration without real trade-offs being made. (IC 1997b, p. 151)

Taxation

Vehicle purchase, manufacture, ownership and use are affected by a range of Commonwealth and State taxes, including company tax, fringe benefits tax, sales

tax, stamp duty, registration fees and excise tax. Taxation of the automotive industry and users of its products contributes a significant proportion of government revenue. For example, over one-quarter of Commonwealth sales tax revenue is raised from the sale of passenger motor vehicles, commercial vehicles, parts and accessories (IC 1997b, p. 114).

Different taxes affect the demand for vehicles and increase production costs. Considerable variation has occurred in government taxation policies over the last twenty years. Vehicles and vehicle use have been more heavily taxed than many other goods and services which biases demand away from vehicles (IC 1997b, p. 120).

Economic infrastructure

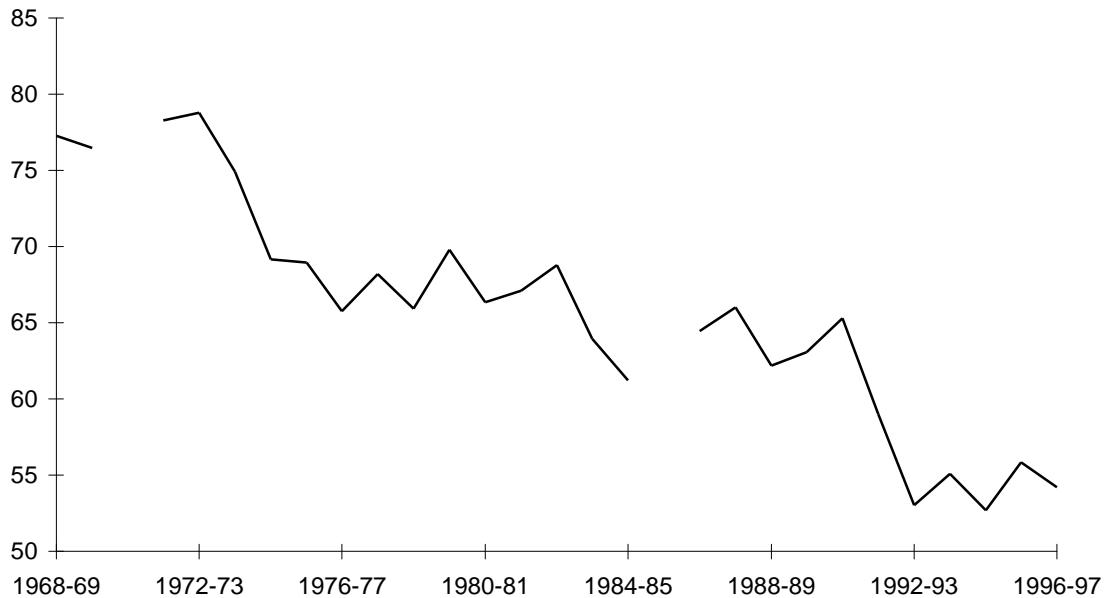
Reform of government business enterprises and the implementation of the National Competition Policy have impacted on the automotive industry, reducing their costs and improving their competitiveness. Reforms in the electricity, transport and waterfront industries have been the main source of change of this type impacting on the automotive industry (IC 1997b, pp. 157-8).

2.3 Increasing competition

The changing pattern of production in the global automotive industry placed increasing competitive pressures on the local industry. Despite high tariff rates and import quotas, the market share supplied by domestic production declined slightly during the 1980s from 67 per cent in 1981-82 to 62 per cent in 1988-89 (figure 2.2).

In the 1990s, there was a sharp increase in import share of the domestic market. The share supplied by domestic production fell from 65 per cent in 1990-91 to 53 per cent in 1992-93. Since then it has remained at about this level.

Figure 2.2 **Domestic market share of the Australian automotive industry**
Per cent



Source: Commission estimates based on ABS data.

In the PMV segment, an increase in imports was more closely associated with the abolition of import quotas, the local content scheme and the reductions in tariffs at the end of the 1980s. The domestic market share of PMVs fell sharply from about 85 per cent in 1987 to about 75 per cent in 1990, and continued to decline in the 1990s to 58 per cent in 1997 (figure 2.3).

The bulk of the increase in imports came from the micro/light/small car market segment, where the domestic market share has fallen from over 70 per cent in 1988 to under 15 per cent in 1996 (figure 2.4). The medium, upper medium and luxury car market has decreased only slightly over this same period from just over 80 per cent to just under 80 per cent (IC 1997b, pp. 32-3).

In the upper medium segment, domestic producers retain some advantage. Seventy-five per cent of new upper medium cars are purchased by fleets and one-third of these are government purchases. Government purchasing policies favour purchase of Australian-made vehicles and provide domestic producers with a captive market.

Figure 2.3 Domestic market share 1974 to 1997 for passenger motor vehicles

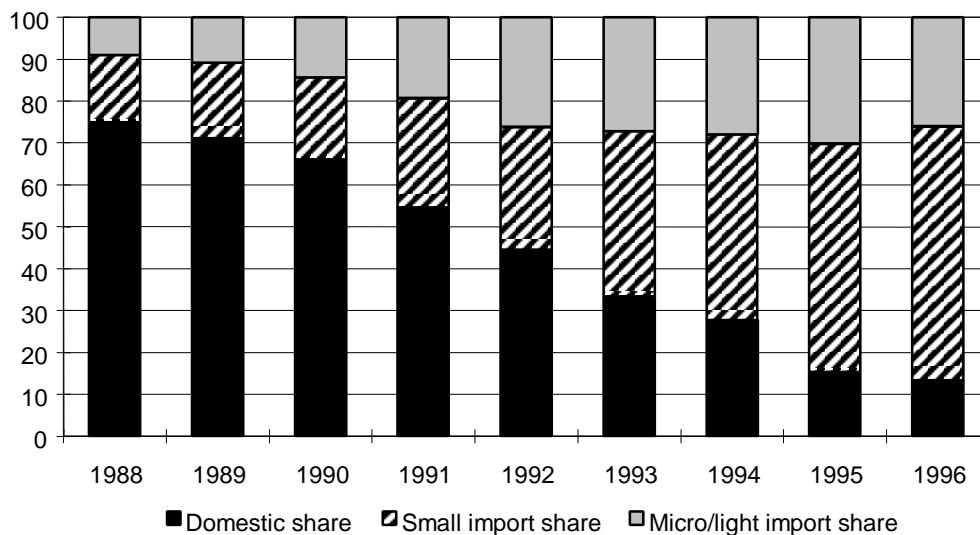
Per cent



Source: Commission estimates based on IC (1997b), AIA various years, IAC (1983) and DISR (1999a).

Figure 2.4 Micro, light and small car market 1988 to 1996

Per cent



Source: PAXUS and VFACTS, cited in IC (1997b).

From 1988, the share of local production in the components market largely mirrored the trend in the PMV market, although there has been a slight increase in market share since 1995-96.

2.4 Industry responses

Faced with increased competition and declining assistance, automotive firms have responded in a number of ways such as rationalisation, increasing specialisation, introducing new technologies, investment in research and development, improving management and work practices, increasing investments and improving quality.

Management culture

A change in entrepreneurial attitudes has seen most Australian producers increase their awareness of the need to view themselves as part of the global industry. The small size of the Australian market and its increasing fragmentation had made it necessary for Australian vehicle manufacturers to establish their place in the global strategies of their parent companies. This involves the active development of export markets to supplement their domestic vehicle sales (IC 1997b, p. 24).

Certainly some of the increase in competitive pressure in the automotive industry has been via the expectation of greater competition as tariffs declined and the increased range of vehicles (particularly at the very small end) competing with domestic producers. In addition, the 1984, 1988 and 1992 assistance packages clearly signalled to the industry that declining assistance and greater involvement in world markets was the direction of government policy.

The changes in government policy and increasing competition also encouraged the Australian automotive industry to become more outwardly focused since the late 1980s. Export intensity as measured by exports as a proportion of turnover has increased from around 3 to 4 per cent in the late 1970s and early 1980s and about 6 per cent in the late 1980s to almost 16 per cent in 1996-97.

Industry rationalisation

Industry structure and activities have altered in response to the increase in competition. In 1985, there were five PMV manufacturers producing 13 models in eight plants around Australia. There are now four vehicle assemblers each operating one assembly plant and producing a total of five models.

Three recent examples of substantial adjustment in the industry were:

- the closure of Nissan's vehicle manufacturing facilities in 1992;
- the relocation of Toyota's production facilities from Dandenong and Port Melbourne to Altona; and

-
- the reduction in Ford's workforce in Geelong and Broadmeadows, and the closure of its Homebush plant in NSW.

There has also been some rationalisation in the component industry with most major components being produced by sole local suppliers. In line with international developments, all the PMV manufacturers have been rationalising their component supply base, where the component producer delivers a complete component rather than a variety of smaller unassembled components.

Specialisation

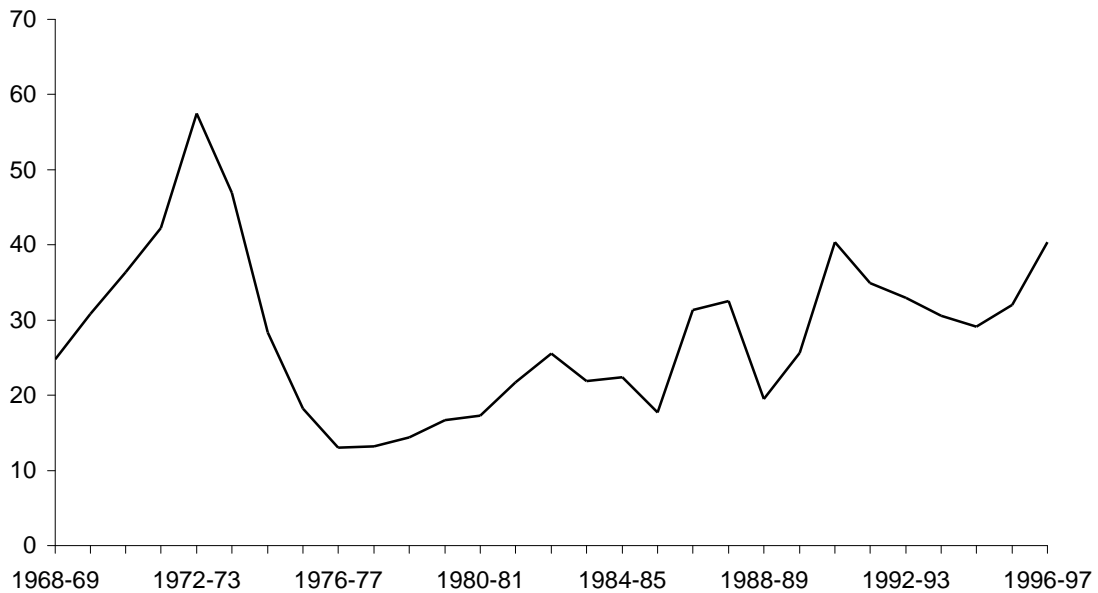
The main response of domestic automotive producers to the changed assistance arrangements and increased imports in the small end of the market was to re-orient production towards the upper medium segment of the market.

All manufacturers have withdrawn from small vehicle production. Over the period 1988 to 1996, local production of the Mitsubishi Colt, Ford Laser and Nissan Pulsar ceased. The medium/upper medium/luxury segment of the market remains dominated by locally produced vehicles. The domestic share in this segment, has been stable for the last decade at around 80 per cent. The relative size of this market segment expanded from about 28 per cent to over 40 per cent of all PMV sales over the period 1988 to 1996.

In 1997, sales by Federation of Automotive Parts Manufacturers (FAPM) member companies, which include sales of some imported components, continued to rise, although there appeared to be a shift from aftermarket sales to original equipment sales. This may reflect improved specifications for cars, such as the standard fitment of air conditioning (DISR 1999a, p. 25).

The increase in the intra-industry trade (IIT) index over the last decade provides further evidence of increasing product specialisation. The IIT index measures the simultaneous trade of goods produced within the same classification. If a country exports roughly the same amount of goods within a classification as it imports, the IIT index will be high, indicating a high degree of specialisation. However, if there is mainly one way trade that is, imports with no exports or vice versa, the IIT index will be low, indicating low levels of specialisation. Trade liberalisation will normally lead to greater international specialisation within and between industries in the production of goods and services. Figure 2.5 shows the index increasing steadily throughout the 1980s and 1990s.

Figure 2.5 **Intra-industry trade index for the automotive industry, 1968-69 to 1996-97**



Source: Commission estimates based on ABS data.

There is significant concentration in the manufacture of automotive components. Many components are produced by only a small number of firms. A number of these firms are specialist component producers (SCPs), producing exclusively for the automotive industry.

Technology

Investment in new production equipment such as robotics, numerically controlled machinery and laser equipment can play an important role in improving productivity as well as reducing costs and providing consistently higher quality. (BIE 1996, p. 75)

Many PMV producers have invested heavily in new technologies and capital equipment in recent years. For example, Ford invested in new technology in an effort to increase the efficiency of its manufacturing process. Use of robots in the welding process was introduced in the mid-1980s. Computer aided design, computer aided engineering and computer aided manufacturing are also employed. Other technologies and capital equipment that the company has invested in include new stamping presses and an automatic mould line in the casting plant.

Economies of scale

Rationalisation, increasing specialisation and the introduction of new technology have contributed to bring access to greater economies of scale in the industry. Increases have occurred in volumes per plant and per model (figure 2.6). Average volume per plant is now around 80 000 units compared with less than 50 000 in the mid-1980s. Some assembly lines are producing around 100 000 units per annum and Holden is planning a capacity of 150 000 units at its Elizabeth plant (IC 1997b, p. 93). While Australian plants remain relatively small by world standards, there has been a considerable expansion in economies of scale in the local industry following changes in the protection regime.

Research and development

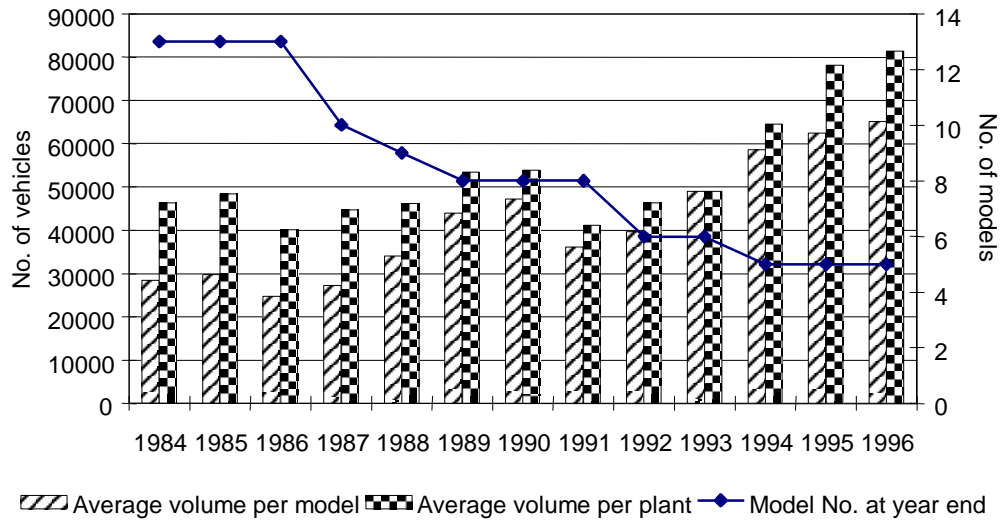
A significant response to the increase in competition has been investment in R&D capabilities. Some multinational firms have located their regional R&D headquarters in Australia and independent Australian firms have succeeded in selling design and R&D services to the international market.

In recent years, business expenditure on R&D (BERD) by the automotive industry has been cyclical, with strong growth since 1992-93. The PMV producers account for the largest part of the automotive BERD. This recent upswing may have been heavily influenced by the product development cycles of new models, in addition to the normal competitive pressures on firms to stay ahead of their competitors (figure 2.7).

R&D intensity measures the ratio of BERD to industry output. R&D intensity in the automotive industry is above the average for all manufacturing in Australia. Figure 2.7 shows that R&D intensity in the industry increased from just under 2 per cent in 1989 to 3.4 per cent in 1997.

The expenditure devoted to R&D by some automotive component suppliers, whether expressed as a proportion of sales or profits, or as expenditure per employee, differs widely. When expressed as a proportion of sales, most surveyed firms have a lower R&D intensity than the industry average. However, these figures may not accurately reflect the R&D intensity in the automotive component manufacturing operations of these companies. Most of the companies are diversified and supply industries other than the automotive industry.

Figure 2.6 **Number of models, volume per plant and volume per model, 1984 to 1996**



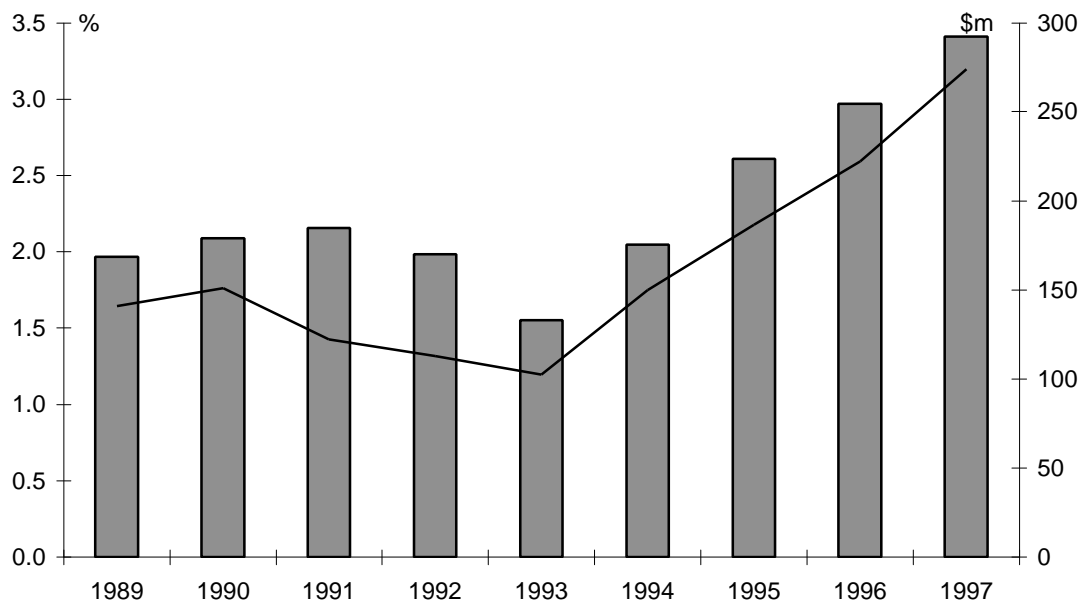
Source: IC (1997).

Many companies are using their Australian subsidiaries as a regional base for servicing the technology and design needs of related subsidiaries in other countries. For instance, Britax Rainsford develops particular technologies for the manufacture of external mirrors, which it supplies to other affiliated companies in Europe and the USA, and Robert Bosch Australia has established itself as the global headquarters for the Bosch group for the design, development, manufacture and marketing of car body electronics. In addition, some independent Australian firms are also supplying design and R&D services from Australia into world markets (IC 1997b, p. 77).

At the vehicle makers level, Holden is establishing a design and development centre for the Asian region. The skills and capability built up from adapting overseas designs to Australian conditions has formed a base for adapting other General Motors Corporation (GMC) designs to meet particular market requirements. Holden has also been designated as the centre of expertise in heating, ventilation and air conditioning for GMC products sold outside North America. When combined with other design and development tasks, Holden expects to export over \$200 million in R&D services from 1997 through to 2001 (IC 1997b, pp. 77-8).

Figure 2.7 **Business expenditure on R&D by motor vehicle producers and as a proportion of the value of production, 1989 to 1997**

1997 dollars



Source: DISR (1999a).

The export of R&D services is an important development for the Australian automotive industry. Although most automotive R&D services have received a boost from their relatively recent inclusion in the EFS, the apparent growth in this part of the industry appears to be also based on intrinsic technological strengths (IC 1997b, p. 78).

Management and work practices

Changes to workplace design and practices have been necessary to cope with increased competition. New organisational techniques associated with lean production, such as *kanban* (demand driven, just-in-time production) and *kaizen* (the quest for continuous improvement) began to be implemented in the automotive industry in the early 1990s. In order to adopt these new organisational techniques, management has had to adopt a more flexible and cooperative approach in relations with employees. Today lean production is used in some form by each Australian vehicle manufacturer and by a number of their suppliers.

The International Motor Vehicle Program has measured the extent to which elements of lean production are present in the Australian automotive industry. The measures covered include work systems, which relates to the multi-skilling of the

workforce, human resource management, which relates to the commitment by management to human resources policy, and factory practices which measures a set of production practices that covers the level of inventory stocks, frequency of parts delivered to the line, etc.

These measures show an overall increase in the use of lean production between 1989 and 1993 (table 2.2). Large increases occurred in the use of multi-skilled workforces and the commitment to human resource management. However, lean production factory practices associated with the level of inventory stocks and frequency of parts delivered on time decreased. More recent measures of these indices are not available, but anecdotal evidence suggests that they have probably improved since 1993. (IC 1997b, p. 84)

Toyota provided evidence to the 1997 IC inquiry of improvements in their human resource strategies and inventory management, which is part of factory practice. In 1990, only about 20 per cent of local parts were delivered just-in-time, by 1994 this had increased to 100 per cent. This reduced the number of days stock being held from eight to one, and it is now below four hours. (IC 1997b, p. 85)

Table 2.2 Australian assembly plants management policies index, 1988 and 1993

| | 1988 | 1993 |
|--|------|------|
| Work systems ^a | 23.8 | 47.8 |
| Human resource management ^b | 18.8 | 55.8 |
| Factory practice ^c | 48.1 | 45.3 |

^a A score of 100 indicates plants operate with a multi skilled workforce. A score of 0 means the plants work systems are highly specialised. ^b A score of 100 indicates a high commitment by management to human resources management policy; a score of 0 indicates a low commitment. ^c This index measures a set of production practices that covers the level of inventory stocks, frequency of parts delivered to the line, etc. A score of 100 indicates lean production, while a score of 0 indicates buffered production.

Source: Krafcik and MacDuffie (1989) and MacDuffie and Pil (1996) cited in IC (1997b).

Improvements have been made in workplace design and practices and industrial relations in the industry in order to cope with increased competition.

The factors driving the changes have been strongly influenced by the reduction by the Australian government of tariff protection for manufacturing industries. This has meant that firms have been forced to undertake immediate and drastic changes to their industrial relations and human resource policies. This has come as a shock to the automotive industry which was sheltered for so long from international competition. (Bamber and Lansbury cited in IC 1997b, vol. 2, p. H14).

Changes in the industrial relations system and the introduction of enterprise bargaining have contributed to more flexible work practices. The four

manufacturers, and most of the larger components makers, have negotiated their own enterprise agreements. They are all underpinned by individual awards and have allowed, to varying degrees, flexibility in workplace arrangements and employee and management access to more flexible terms and conditions.

Skill development

Since the late 1980s, attention to training in the automotive industry has increased significantly. This change can be attributed to factors including: the establishment of links between training and industrial awards; reform of the national training policy; and the commitment to training demonstrated by automotive firms, unions and employees.

Although the amount of training occurring in the automotive industry is high relative to manufacturing and all industry averages, ABS figures suggest training activity in the automotive industry decreased between 1989 and 1993. This decrease was contrary to the movements in average training expenditure for manufacturing and all industries. Participants in the 1997 inquiry argued that the ABS data were not consistent with their experience in that expenditure had not decreased. However, there was a significant decline in employment in the industry (table 2.3).

Table 2.3 **Average training expenditure, Australia, July to September, 1989 and 1993**

| Industry | <i>Per cent of gross wages and salaries</i> | | <i>Dollars per employee</i> | | <i>Hours per employee</i> | |
|---------------------------------------|---|------------|-----------------------------|-------------------|---------------------------|------------|
| | 1989 | 1993 | 1989 | 1993 ^a | 1989 | 1993 |
| Motor vehicles and parts ^b | 3.6 | 3.0 | 237 | 207 | 11.3 | 9.2 |
| Transport equipment | 3.9 | 3.5 | 262 | 252 | 14.3 | 11.5 |
| Manufacturing | 2.2 | 2.6 | 142 | 182 | 6.5 | 6.5 |
| Total | 2.2 | 2.9 | 133 | 171 | 5.7 | 5.6 |

^a 1993 expenditure has been deflated by the trainers wage index to obtain figures in 1989 dollar values.

^b ASIC category 323 Motor vehicles and parts.

Source: ABS. 6353.0 and unpublished data cited in IC (1997b).

Capital and labour inputs

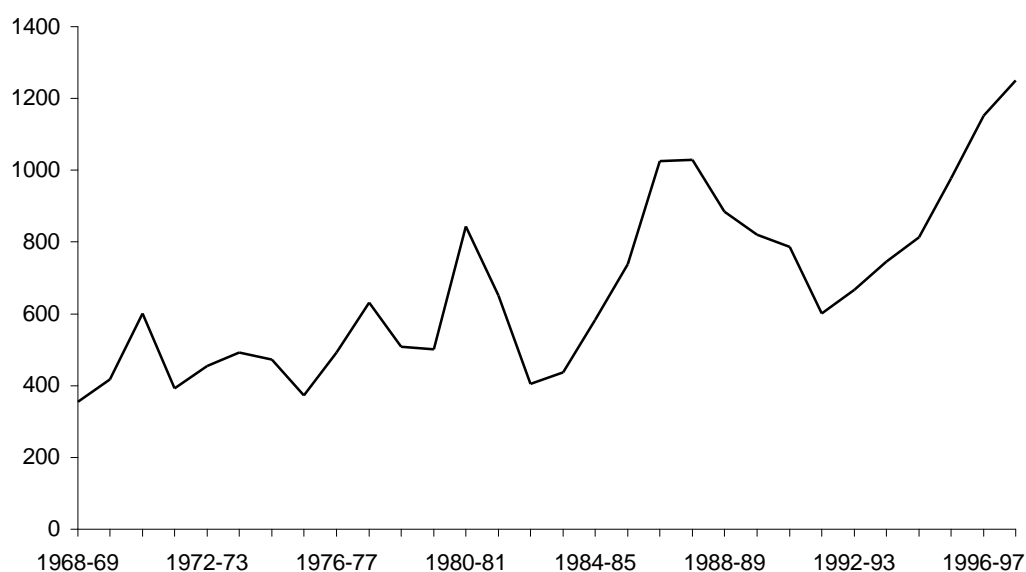
Capital

The amount of capital devoted to the production of vehicles can influence labour productivity and is therefore an important consideration in understanding industry performance. Net capital stock data is only available for the transport equipment industry, the large part of which is comprised of the automotive industry. The automotive industry accounted for around 67 per cent of output of the transport equipment subdivision in 1996-97.

High levels of investment occurred in the transport equipment industry between 1985-86 and 1997-98, with the exception of the recession years of the early 1990s (figure 2.8). This was the highest and most sustained period of capital investment in the industry in the previous thirty years. Record levels of investment were achieved in 1996-97 and 1997-98. Investment by the PMV producers has been highly cyclical and mostly associated with product development.

There has been a considerable expansion of net capital stock in the transport equipment industry. Between 1985-86 and 1990-91, it increased by 15 per cent. Since then it declined over several years because of depreciation on the earlier surge in new capital investment but in 1997-98 it returned to the previous high level with the increase in new investment.

Figure 2.8 Private new capital expenditure for the transport equipment industry, 1968-69 to 1997-98
\$1989-90, \$million



Source: Commission estimates based on ABS 5625.0 and unpublished ABS data.

Employment

Employment in the automotive manufacturing industry decreased from a peak in 1973-74 of about 90 000 persons to 47 000 in 1997-98 (figure 2.9). Part of this decline occurred in motor vehicle production. In the early 1970s, employment in motor vehicle production was nearly 60 000. In 1997-98, employment was about 20 000.

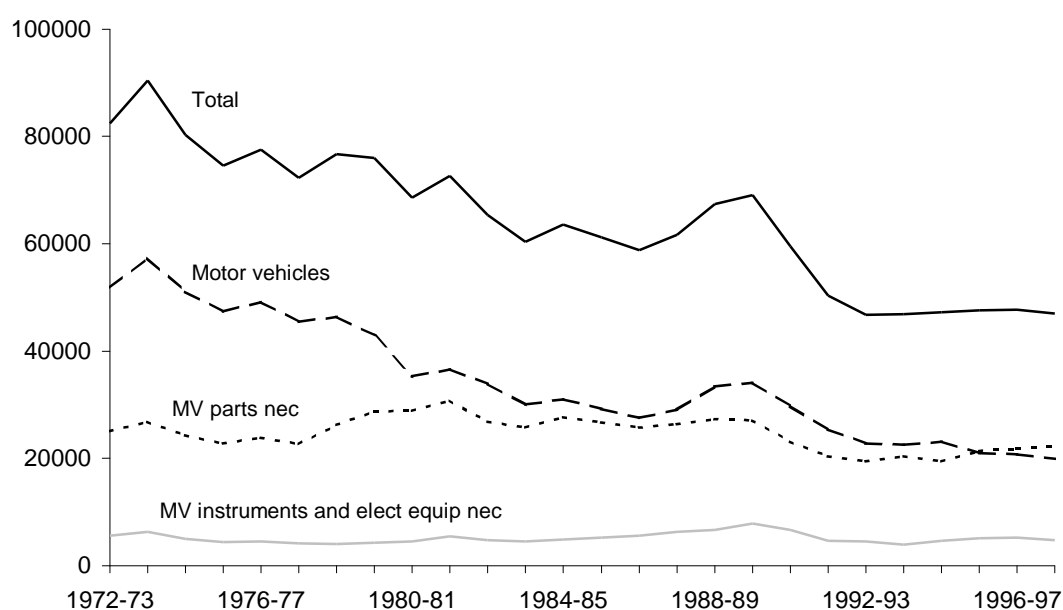
For much of the 1980s, employment had stabilised in the industry, largely as a result of the high levels of protection and the devaluation of the exchange rate. A large decline in employment occurred after 1989-90 and continued beyond the recession of the early 1990s.

Capital/labour ratios

Capital/labour ratios were estimated for the transport equipment industry because of the unavailability of net capital stock data for the automotive industry.

Between 1988-89 and 1991-92, the capital/labour ratio for the transport equipment industries increased by 13.2 per cent per year. This compares with an increase of 7.9 per cent per year for the manufacturing sector. Over the previous seven years, the ratio increased by 3.1 per cent per year for transport equipment and 2.3 per cent per year for manufacturing. After 1991-92, the ratio for transport equipment declined slightly while that for manufacturing increased slightly.

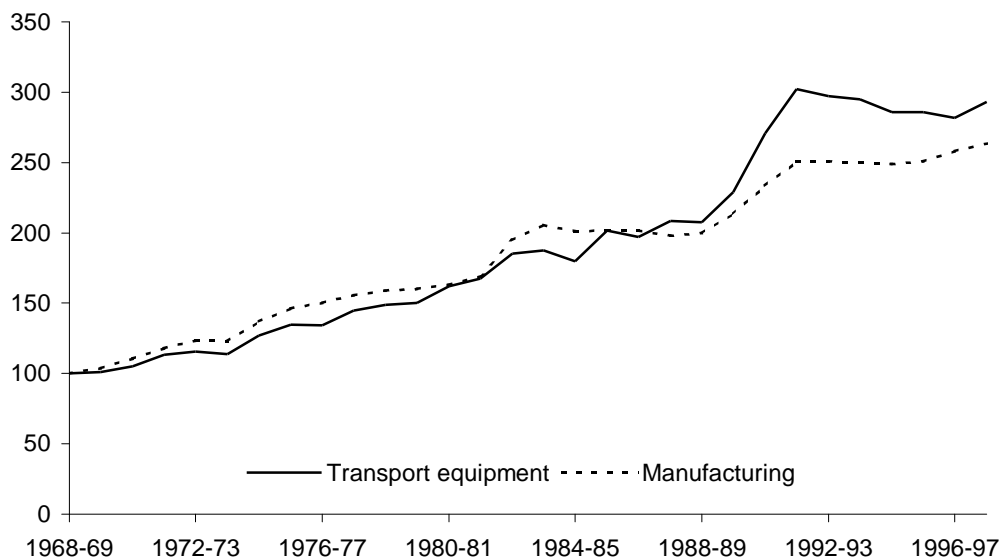
Figure 2.9 Employment in the automotive industry, 1972-73 to 1997-98



Data source: IC (1995a) and ABS 8221.0, various years.

The sharp increase in capital/labour ratios from about 1987-88 reflect both increasing capital investment and major reductions in employment in the industry. The declining ratio after 1991-92 largely reflects the reduction in net capital stock (figure 2.10).

Figure 2.10 Net capital stock per employee in the transport equipment industry and total manufacturing, 1968-69 to 1997-98
Index 1968-69 = 100



Source: Commission estimates based on ABS data.

2.5 Productivity performance

Labour productivity measures are available for the automotive industry. Multifactor productivity (MFP) measures, however, are only available at the ANZSIC subdivision level — transport equipment.

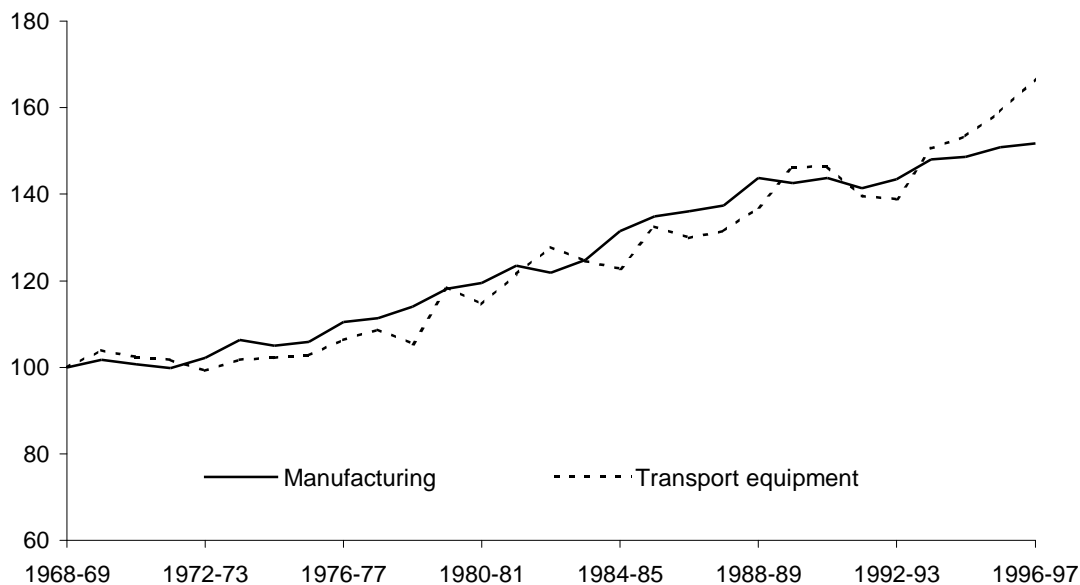
Multifactor productivity

MFP for the transport equipment industry has fluctuated considerably at times (figure 2.11) and makes it difficult to determine the appropriate periods over which to compare growth rates. Estimated growth rates are quite sensitive to the end points of comparison periods.

Growth rates estimated on the peak-to-peak aggregate productivity cycle show strong MFP growth since the late 1980s. Over the long aggregate productivity cycle from 1981-82 to 1988-89, it increased at an average annual rate of 1.7 per cent and

Figure 2.11 Multi-factor productivity for the transport equipment industry and the manufacturing sector, 1968-69 to 1996-97

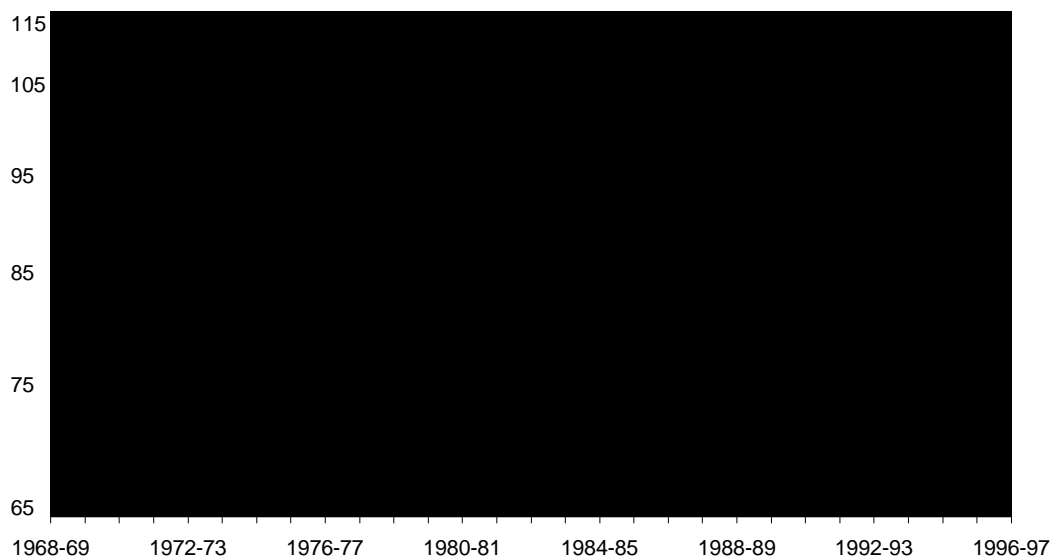
Indexes 1968-69 = 100



Source: Gretton and Fisher (1997) and Commission estimates for 1995-96 and 1996-97.

Figure 2.12 Multifactor productivity for the transport equipment industry, 1968-69 to 1996-97

Natural log scale



Source: Gretton and Fisher 1997 and Commission estimates for 1995-96 and 1996-97

between 1988-89 and 1996-97 it grew at 2.5 per cent per annum. During the first cycle, MFP growth in the transport equipment sector was significantly below that for the manufacturing sector as a whole (2.2 per cent per annum) but, in the reform period, it was significantly higher than for manufacturing (0.7 per cent per annum).

A range of estimates of MFP growth can be obtained by calculating growth on different peak-to-peak industry productivity cycles.

To reduce the sensitivity of the calculation of productivity growth rates to the selection of end points, exponential trend lines were fitted for the periods before and after 1986-87 (figure 2.12). According to this measure, MFP has increased at an average rate of 2.1 per cent a year since 1986-87, compared with 1.7 per cent a year prior to then.

Underutilised capacity has probably been a factor constraining MFP growth since the late 1980s. Historically high levels of investment have been sustained from 1985-86 to 1996-97 (except during the recession) but production suffered in the recession and for a few years thereafter. Production has since recovered to historically high levels and there are signs of stronger productivity growth reflecting improved efficiency in recent years.

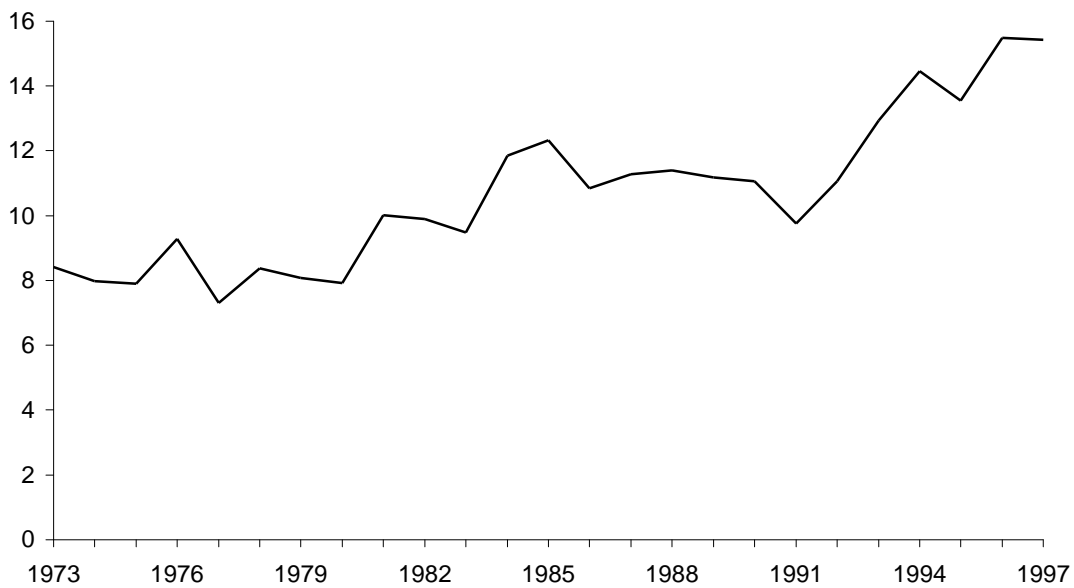
Labour productivity

A simple measure of labour productivity growth in the PMV industry is the number of vehicles produced per employee. This measure shows significant productivity growth during the first half of the 1980s, little growth during the second half and considerable improvement in the 1990s (figure 2.13).

The vehicles per employee measure does not take into account the productivity performance of the components sector. Figure 2.14 provides a picture of labour productivity for the automotive industry using value added per employee.

Labour productivity in the automotive industry according to this measure doubled since the mid-1970s, but most of the increase was achieved from the late 1980s when significant decreases in protection began to be implemented. The precise turnaround in productivity growth cannot be determined because of a gap in the data. It may have been as early as 1987-88 or as late as 1989-90. From 1988-89 to 1996-97, labour productivity grew at an annual average rate of 7.0 per cent, compared with a growth rate of 1.1 per cent prior to 1988-89 (table 2.4). Automotive labour productivity underperformed, compared with Manufacturing through the 1970s and 1980s, but outperformed it after 1986-87 and through the 1990s

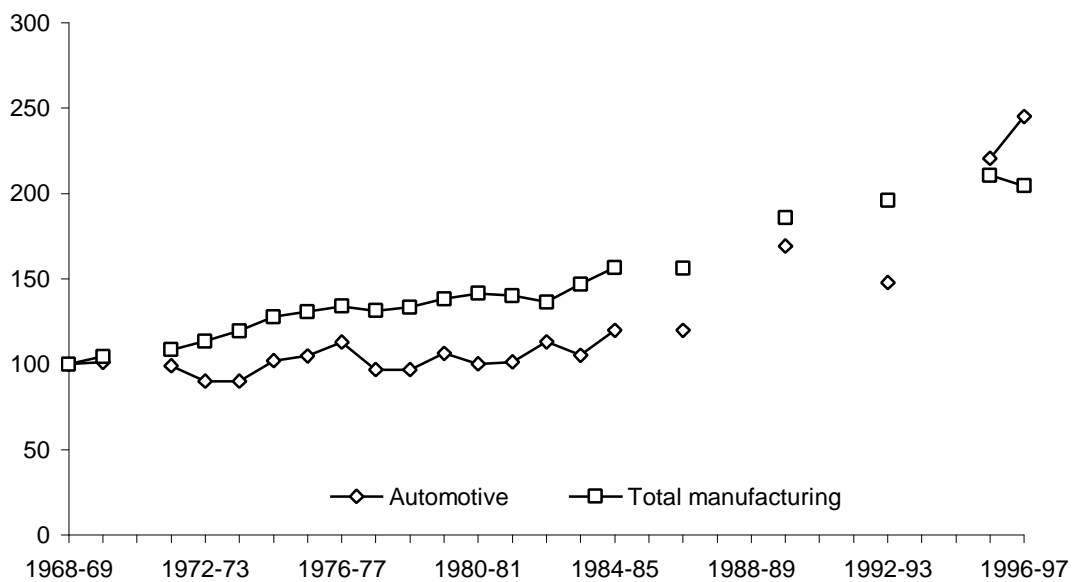
Figure 2.13 Vehicles assembled per employee, 1973 to 1997



Data source: IC (1997b) and DISR (1998).

Figure 2.14 Value added per employee, automotive industry and total manufacturing, 1968-69 to 1996-97

Indexes 1968-69 = 100



Source: Commission estimates based on ABS data.

Table 2.4 Average annual growth in value added per employee, selected periods

Log-linear growth rate

| | <i>Growth rate</i> |
|--------------------|--------------------|
| 1970s | 0.7 |
| 1980s | 3.3 |
| 1990s | 6.8 |
| 1968-69 to 1988-89 | 1.1 |
| 1988-89 to 1996-97 | 7.0 |

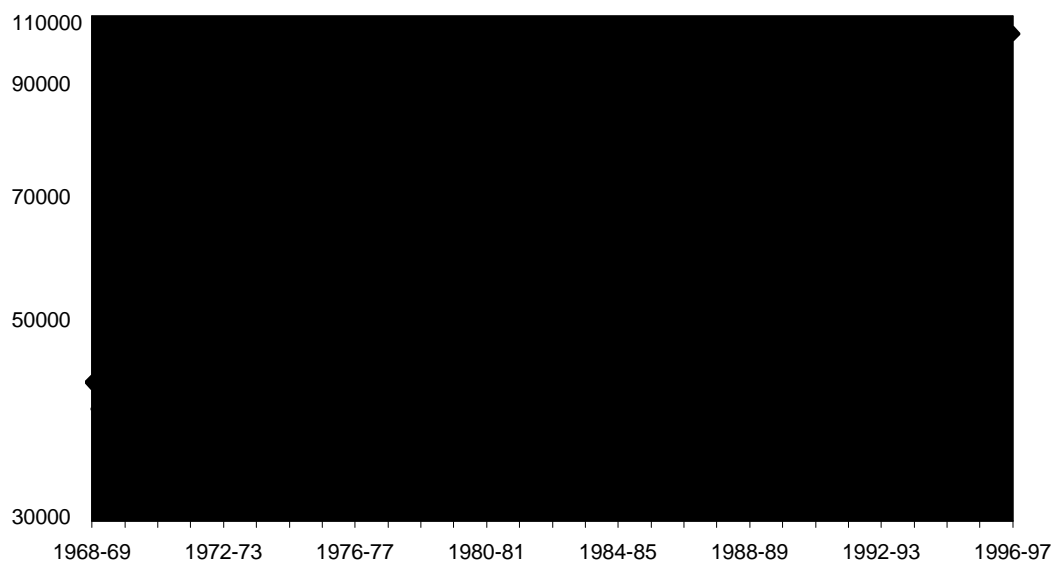
Source: Commission estimates based on ABS data.

Growth rates were also estimated from fitted exponential trends for the periods before and after 1986-87 (figure 2.15). These confirm the strong improvement in labour productivity in Automotive in the late 1980s and 1990s. Growth increased from 1.0 per cent a year before 1986-87 to 6.4 per cent a year after 1986-87.

Capital deepening seems to have been a major influence on the initial improvement in labour productivity growth. Between 1986-87 and 1991-92, the capital/labour ratio for the transport equipment industries increased by 9 per cent per year compared with 4 per cent per year over the previous seven years. The increase between 1986-87 and 1991-92 was driven by both increases in net capital stock and large reductions in employment.

Figure 2.15 Value added per employee for the automotive industry, 1968-69 to 1996-97

Natural log scale



Source: Commission estimates based on ABS data.

There was a setback in labour productivity growth in the early 1990s at the time of the recession but high growth has prevailed since then. MFP trends suggest improving efficiency in resource use has been the dominant influence in recent years rather than capital deepening. The capital/labour ratio has declined since 1991-92 by 1.4 per cent a year while labour productivity increased.

2.6 Role of microeconomic reforms

Reductions in protection beginning in 1988 and continuing into the 1990s appear to have resulted in greater import competition and action by the industry to improve productivity. In the late 1980s, there was an upturn in labour productivity growth and large improvements in productivity were achieved in the 1990s.

The change appears to have been initiated through the PMV industry. The domestic market share of the automotive industry as a whole largely held up until 1990-91 but a sharp increase in import competition in the passenger motor vehicle market occurred from about 1988 when import quotas for PMVs were abolished and the phased reduction of tariffs through to 2000 was initiated. Domestic market share supplied by local PMV production continued to decline during the 1990s. Up until the late 1980s the industry was insulated from pressure.

The improvements in labour productivity in the automotive industry were achieved mainly through rationalisation of plant and models, greater product specialisation, adoption of new technology, improved economies of scale and changes in management and work practices.

A change in entrepreneurial approach was critical to the improved performance. Faced with the increased competition, the industry rationalised both plants and car models in order to achieve some economies of scale. The industry was also provided with incentives (the export facilitation scheme) to become more globally focused. Firms concentrated on the upper medium market segment where they are better able to meet international competition, in part due to government purchasing arrangements which favour domestically produced vehicles.

While the increased competitive pressure flowing from the announcement and implementation of reduced assistance has been particularly significant in its own right, it also facilitated the industry's readiness to take advantage of other reforms (for example, the improved institutional framework in the labour market). Improved work practices and labour relations have flowed from changes in the institutional arrangements in the labour market. Lean production is now used in some form by each Australian vehicle manufacturer and by a number of their suppliers.

3 Textiles, clothing and footwear

This case study analyses the response of the TCF industries to changes in government protection policy and other long-term factors affecting their development. It compares the performance of the industries before and after the changes in protection and examines the links between these reforms and productivity performance. It draws heavily on information provided in reports of the Industries Assistance Commission and the Industry Commission on the industry.

3.1 An overview of the development of the TCF industries

Australia's Textiles, clothing & footwear (TCF) industries undertake a wide range of activities from the processing of raw materials, such as cotton, wool, leather and synthetics, through to the production of final goods such as clothes, shoes, household linen, carpets and industrial textiles. Many sections of the industries are highly interdependent.

Production in these industries has long been highly labour intensive. The industries are characterised by low productivity levels, employment of low skilled workers, few economies of scale and a large proportion of small firms. Until recently, production was almost wholly directed at the domestic market.

The TCF industries have a long history of government assistance through tariffs, import quotas and subsidies. Assistance was largely provided on a needs basis and the products which had the greatest difficulty in competing with imports received the greatest assistance.

During the 1970s and 1980s, the industries experienced increasing competition from low-cost sources of production in the developing countries of Asia. Rising costs of local production caused by a rapid increase in wage rates also reduced the competitiveness of the local industry.

The response of the industries was to seek additional assistance which was forthcoming from governments. Temporary assistance was provided in the form of increased tariffs and quotas. Sectoral and industry plans were established by successive governments to maintain the competitiveness of the industries. Protection

to the TCF industries escalated along the production chain. This meant that domestic production in the finished goods, more labour-intensive end of the market was encouraged relative to the more capital-intensive intermediate goods end where Australia had some competitive advantage.

Table 3.1 indicates that by the mid-1980s, the industries were receiving very high levels of protection which insulated them from adjustment to the changed economic circumstances to be postponed. Total value added, employment and domestic market share had declined even further despite the increased assistance. Labour productivity increased only slowly and the capital/labour ratio remained relatively unchanged. The TCF industries examined by the Industries Assistance Commission in 1985-86 looked much like they did a decade earlier despite the increased protection (IAC 1986b, 1980, 1977).

Table 3.1 Selected indicators for the TCF industry, 1974-75, 1984-85, 1995-96

| | 1974-75 | 1984-85 | 1995-96 |
|--|---------|---------|---------|
| Value added ^a (\$m) | 4 297 | 4 099 | 3 361 |
| Employment (no.) | 139 387 | 111 500 | 78 000 |
| Domestic market share ^b (%) | 71 | 64 | 49 |
| Export intensity ^c (%) | 2 | 3 | 16 |
| Value added ^a per employee (\$) | 30 830 | 36 765 | 43 094 |
| Value added ^a per hour worked (\$) ^d | 15.80 | 19.20 | 24.13 |
| Capital labour ratio ^e (\$/employee) | 16 069 | 16 678 | 27 808 |
| Establishments ^d (no). | na | 3 956 | 5 509 |
| Effective rate of assistance (%) | 65 | 156 | 42 |

^a Value added is in 1989-90 prices. ^b Market share is defined as sales of domestically produced goods less exports, as a proportion sales of domestically produced goods less exports plus imports and duty paid on imports. ^c Exports as a percentage of turnover. Data excludes wool scouring (ANZSIC 2211). Data for 1984-85 is for 1983-84 and data for 1995-96 is for 1996-97. ^d Number in 1995-96 column is for 1994-95. ^e Capital to labour ratio is measured as the net capital stock per employee. na - not available.

Source: Commission estimates based on ABS data.

In the decade to the mid-1990s, there has been some significant change in the industries (table 3.1). Large reductions in protection were implemented. While value added, employment and domestic market share continued to fall, there is evidence of a change in industry orientation and performance. Some sections of the TCF industries have expanded and many have become more outwardly focused than in the past. Since the mid-1980s, exports as a proportion of industry turnover increased nearly threefold. A number of companies have moved some of their operations offshore and are now importing a substantial proportion of their range. Labour productivity growth improved slightly and the capital/labour ratio increased by

about 67 per cent between 1984-85 and 1995-96. The TCF industries today are developing, albeit slowly, in a different direction to that set in 1970s and much of the 1980s.

Nevertheless, the performance of TCF firms has been highly disparate in the 1990s. Some firms have made great improvements in international competitiveness, while others still have a substantial way to go. New companies are also continuing to emerge. Industries which have grown over the past decade include leather and certain fibres, and yarns and fabrics. Textile products (such as towels and sheets) gained market share at the expense of imports.

3.2 Factors affecting the industry

A number of factors have influenced the development of the TCF industries. They include globalisation, rising domestic costs, changes in consumer tastes, technological change, changes in the exchange rate and government policy.

Shifts in international competitiveness

The competitive position of the TCF industries has declined over the past thirty years as a result of changes in the pattern of world production and trade towards low wage developing countries and increasing domestic costs of production.

Global pressures

Over the last thirty years large shifts in comparative advantage changed the established pattern of world trade and growth in TCF products. There has also been a migration of textiles and clothing industries within Asia; first from Japan to the newly industrialising economies (Korea, Taiwan and Hong Kong) and, more recently, to China, Thailand, Indonesia and other countries (table 3.2). Developing countries (mainly in Asia) now supply more than half of the world's exports of clothing and a third of global textile exports, double their share in the late 1960s (IC 1997c, p. 65).

Developing countries were able to exploit their advantage of low cost labour to produce labour intensive goods using standard technology. The migration of production to developing countries has been driven by rising incomes and wage rates in developed countries and by technological and communications advances which enabled greater global specialisation in production (IC 1997c, p. 66).

An important factor underlying this relocation of industries has been the ability to separate out of production activities such as design, product research and development, marketing and other information processing activities. High wage, high income countries, like Australia, have a comparative advantage in these activities but a disadvantage in labour intensive production activities. The economic characteristics of these two sets of activities has led to greater internationalisation, with labour intensive production moving to low wage countries.

Table 3.2 Textile and clothing exports as a percentage of world exports of textiles and clothing, 1980 and 1995

Per cent

| | <i>Textiles</i> | | <i>Clothing</i> | |
|----------------------------|-----------------|-------|-----------------|-------|
| | 1980 | 1995 | 1980 | 1995 |
| China ^a | 4.6 | 9.1 | 4.0 | 15.2 |
| Taiwan | 3.2 | 7.8 | 6.0 | 2.1 |
| Hong Kong ^b | 1.7 | 1.2 | 11.5 | 6.0 |
| Indonesia ^c | 0.1 | 1.6 | 0.2 | 2.1 |
| Japan | 9.3 | 4.7 | 1.2 | 0.3 |
| Korea | 4.0 | 8.1 | 7.3 | 3.1 |
| Malaysia | 0.3 | 0.7 | 0.4 | 1.4 |
| Singapore ^b | 0.3 | 0.2 | 0.9 | 0.4 |
| Thailand | 0.6 | 1.1 | 0.7 | 2.9 |
| Extra-EU (12) ^d | 17.1 | 14.3 | 12.1 | 9.2 |
| Intra-EU (12) ^e | 29.1 | 25.8 | 25.9 | 21.0 |
| US | 6.8 | 4.8 | 3.1 | 2.4 |
| Other | 22.8 | 20.5 | 26.8 | 33.7 |
| World Total | 100.0 | 100.0 | 100.0 | 100.0 |

^a Includes significant exports from processing zones. Export processing zones are free trade enclaves in the customs and trade regime of the host countries. ^b Hong Kong, like Singapore, is both a source of domestically produced exports and a major transshipment point for re-exports. To avoid double counting, re-exports have not been included for both Hong Kong and Singapore. ^c Textiles export data are for 1994. ^d Extra-EU exports refer to exports by EU countries to countries outside the EU. Data for 1995 refer to the EU(15) expanded to include Austria, Finland and Sweden. ^e Intra-EU exports refer to exports by EU countries to other EU member countries. Data for 1995 refer to the EU(15) expanded to include Austria, Finland and Sweden.

Source: IC (1997c).

The shift of production towards low wage countries put strong pressure on the TCF industries of the developed countries to adjust their use of factors of production. Various adjustment strategies were adopted by governments and the TCF industries.

Government support was a common strategy in the developed countries. In some cases, assistance was directed at facilitating restructuring while, in other cases, assistance was provided to delay inevitable adjustments. The most important means

of delivering industry protection was the Multifibre Arrangement (MFA) which provided protection by establishing a mechanism to negotiate bilateral quantitative restrictions on textile and clothing imports from developing countries.

Another adjustment strategy was to reduce production costs, largely through greater use of capital, restructuring of enterprises and commercial relationships, and an increase in labour productivity. However, growth in labour productivity in the EU and the US was not sufficient to reduce their production costs to the extent necessary to match the competitiveness of imports in many areas, particularly in the standardised mass produced items. Consequently, firms sought to specialise in areas of comparative strength while using low labour cost countries for an increasing proportion of their manufacturing operations.

Increasing domestic costs

In labour intensive industries such as TCF, wage differences between countries are a major determinant of competitiveness, particularly for standardised mass produced products.

Domestic TCF producers experienced rising costs through a rapid escalation of wage rates in Australia during the 1970s which reduced the competitive position of this labour intensive industry. Between 1970 and 1978, wage rates in the TCF industries increased at an average annual rate of 18 per cent for females and 14 per cent for males (IAC 1980, p. 18). An important aspect of the increase in costs was the increase in female wage rates as part of the movement towards 'equal pay' with males.

Although the increase in wage rates was similar to that of other industries, the labour intensive nature of production processes and their dependence on female labour meant that the industries experienced relatively more severe cost pressures from increasing wages.

Large differences between in wage costs between Australia and the developing countries of Asia persisted during the 1980s and 1990s.

Changes in demand

Changing patterns of consumer demand have affected the size of the domestic TCF market. In most developed countries, as per capita incomes rise, smaller proportions of the increments in income are spent on clothing and footwear, while increasing proportions are spent on consumer durables and services. In Australia, expenditure

on clothing and footwear as a proportion of total private consumption expenditure declined from about 9 per cent in the mid-1970s to 5 per cent in 1995 (IAC 1986b, IC 1997c).

The change in consumption patterns contributed to the very low growth in domestic demand for TCF products over the past decade. It has had important implications for the Australian TCF industries because most production is directed toward the domestic market.

Technology

Since the late 1970s, computer and electronic technology has been increasingly applied to TCF production, handling and inventory control. It has led to general improvements in speed and operational efficiency of machinery in all stages from fibre preparation through to fabric finishing. Technological progress has been uneven in the textile and clothing industries, with rapid advances in the production of yarns and fabrics and little progress in clothing manufacture.

General developments in transportation and telecommunications technology have also impacted on the TCF industries. Improvements in telecommunications technology further facilitated the development of production, marketing and distribution strategies on a global basis.

Exchange rate movements

During the first half of the 1980s, there was a large depreciation of the Australian dollar. The effect of this depreciation on the competitiveness of industries differed according to the source of imports and the forms of assistance accorded individual industries.

The general impact was to increase the competitiveness of industries by increasing the domestic price of imports. However, the extent of the depreciation varied between different currencies. Imports in the mid-1980s were dominated by newly industrialised and developing countries of Asia (Taiwan, China, Hong Kong and Korea) and developed nations such as Italy and New Zealand. Movements against currencies of these countries tended to be less than movements against the major trading currencies. As a result, the general improvement in the competitive position of the TCF industries was not as great as for other industries whose trade was largely with developed countries.

The improvement in the competitiveness of the TCF industries was reflected in a substantial reduction in measured assistance as a result of the impact of the depreciation on tender premiums for import quotas. The increase in import prices associated with the depreciation lead to substantial reductions in the tender premiums paid for many quota entitlements with some tender pools not being cleared at auction. As tender premiums are incorporated in assistance measures, the measured assistance for the TCF industries declined in the mid-1980s.

Government policy

There has been a long history of government involvement in the TCF industries in Australia. TCF industry-specific assistance first arose in 1908, when protective tariffs were introduced to encourage local manufacturers. An expansion of the TCF industry-specific assistance occurred in 1926 with the introduction of the *Prattern Tariff*. Under these changes to the customs tariff, duties were increased for parts of the textile industry. Since the establishment of the Tariff Board in the 1920s, there have been some 500 separate reports to Australian governments on assistance to TCF industries.

Industry assistance

Throughout the 1970s and 1980s, assistance to the TCF industries increased. The more uncompetitive they became, the more assistance they received. This assistance regime discouraged adjustment to changing global circumstances. TCF assistance was designed to escalate, with higher levels of protection afforded to those activities further along the production chain. By the late 1980s and early 1990s, assistance reductions began to occur. The government implemented a managed approach to reform by encouraging such things as rationalisation and a shift towards export orientation. A timeline of the various forms of assistance that have been afforded the TCF industry over the period 1969 to 2000 is provided in table 3.3.

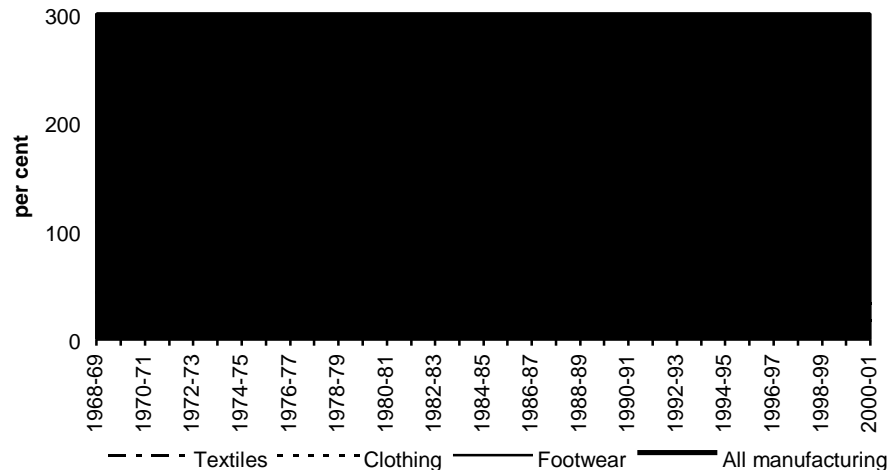
The initial response of government in the 1970s to the declining competitiveness of the TCF industries was to provide additional assistance as required — the ‘made-to-measure’ principle. Levels of protection increased substantially in the 1970s and first half of the 1980s (figure 3.1). The 1982 sectoral plan for the industry continued the needs-based approach to assistance. Clothing and footwear had effective rates of assistance (ERA) of over 250 per cent in the mid-1980s. Along with the automotive industry, the clothing and footwear industries were the most highly protected industries in the Australian manufacturing sector.

Table 3.3 Timeline of TCF assistance, 1969-2000

| <i>Year</i> | <i>Event</i> |
|-------------|--|
| 1969 | Temporary quantitative restrictions on all knitted shirts and outer garments. They were removed after one month, but re-applied two years later for 18 months. |
| 1972 | Tariff quotas introduced on a selection of intermediate and final goods. |
| 1973 | The Government announced a 25 per cent tariff reduction across the board. |
| 1974 | Import licensing re-introduced on imports from Taiwan. Voluntary Restraint Arrangements negotiated with Hong Kong, South Korea, India and China. Australia became member of first Multifibre Arrangement. |
| 1975 | Country-specific quotas imposed. |
| 1976 | Non-discriminatory global quotas imposed. |
| 1977 | IAC TCF Inquiry. Three year industry program announced. |
| 1978 | Tariff quotas introduced on a range of hosiery, knitted underwear and sleepwear. |
| 1979 | Tariff quotas introduced on certain fabrics. One-year extension to the three-year assistance program for TCF industries announced. |
| 1980 | IAC TCF Inquiry. Seven-year program of assistance for TCF industries announced. Sale of quota entitlements above base quota announced. |
| 1981 | The TCF Advisory Committee (replacing TCF Review Committee) established. |
| 1982 | Bounty assistance to local production of most yarns commenced. Start of seven year plan. |
| 1986 | IAC TCF Inquiry. |
| 1987 | TCF Industry Plan — the Button Plan — announced in response to IAC Report. |
| 1988 | Textile Clothing and Footwear Development Authority (TCFDA) established. Changes to 1987 Plan announced as part of May Economic Statement. Changes included: the sunset for quotas brought forward by six months to 1995; and a five percentage point reduction in previously announced 1996 tariff levels. |
| 1991 | Changes to the 1987 TCF Plan announced as part of May Industry Statement. Import Credit Scheme introduced. Further changes in tariff cuts, quota elimination brought forward to 1993. |
| 1992 | Further changes to the 1987 TCF Plan announced in the July Industry Statement. |
| 1993 | TCF quotas abolished. Overseas Assembly Provisions Program introduced. |
| 1995 | Remaining bounties phased out. |
| 1997 | The Government announced that the existing schedule for tariff phasing would continue through to 2000 and TCF tariffs would then be maintained at the same level from 1 July 2000 until 1 January 2005. The Government would legislate to reduce TCF tariffs on 1 January 2005 — to 17.5 per cent for clothing and finished textiles, to 10 per cent for cotton sheeting and fabrics, carpet and footwear and to 7.5 per cent for sleeping bags, table linen and footwear parts. |
| 1998 | The Government announced a \$772 million program of assistance for the TCF industries. |
| 2000 | End of phasing, tariffs to remain at these levels until 2005. |

Source: IC (1997c, 1997a), PC (1998a).

Figure 3.1 **Effective rates of assistance for the textiles, clothing, & footwear and total manufacturing industries, 1968-69 to 2000-01**
Per cent



Source: IC (1995a).

The drop in the ERA in 1985-86 was caused by tender bids for a number of quota categories failing to clear, resulting in zero tender premiums being paid for these quota categories. In addition, many tender premiums for other quotas also fell substantially. Even though measured assistance fell, the depreciation of the Australian dollar provided a temporary buffer as imports had become relatively more expensive.

The TCF industries were assisted by a combination of tariffs, quotas and bounties.

Tariffs for the TCF industry have generally followed an escalated structure, with higher tariff rates afforded to those activities further along the production chain. Within this structure, there were exceptions which had the effect of adding to this escalation. For example, duty-free imports under by-law of intermediate inputs raised the level of assistance to end users.

Quantitative restrictions on imports were the major source of increased assistance to the TCF industries in the 1970s and 1980s. Quotas were constantly fine tuned, as temporary restrictions were imposed, lapsed, and re-imposed or superseded by a general measure. Between 1968 and 1986, over 40 separate announcements relating to changes in TCF quotas were made. The TCF industries received more temporary quantitative restrictions than any other industry sector. By 1980, quotas covered about one third of the textile industry, about 90 per cent of the clothing industry and nearly all the footwear industry.

Production bounties have been an important source of assistance for much of the past 20 years. From 1976, certain textile products were offered bounties. In the early 1980s production bounties were introduced on a wide range of fabrics and yarns.

The 'made-to-measure' protective regime applied protection to individual products to offset the cost disability that domestic producers faced against imported products. It resulted in large differences in levels of protection between different products of the same industries. For example, in 1984-85 men's suits and coats effective rate of assistance was 154 per cent while women's outerwear had an effective rate of assistance of greater than 250 per cent.

A change in government policy occurred in 1987 with the announcement of the Button Industry Plan to reduce assistance through a carefully managed adjustment process. Implementation of the Plan commenced in 1989 with the progressive dismantling of the tariff quota system, phased reductions in bounty rates for certain products and phased reductions in tariff rates.

The phasing arrangements were modified by the May 1988 Economic Statement and the 1991 Industry Statement. As a result, tariff levels were scheduled to fall to 25 per cent for clothing, 15 per cent for most textiles and footwear and 10 per cent for some items by 2000. Quotas were abolished in March 1993 and bounties were abolished in July 1995 although some were replaced by a tariff.

The reductions in assistance were accompanied by the Industry Development Strategy (IDS) and the Labor Adjustment Package (LAP) incorporating a range of budgetary measures designed to improve competitiveness of the industries and assist the adjustment of capital and labour.

The IDS contained programs designed to promote modernisation, rationalisation and capital investment through the provision of capital grants and programs aimed at improving TCF infrastructure (such as training) and business management skills, including exporting. It included the Capitalisation Grants Program designed to encourage rationalisation and new investment by allowing bounty recipients to capitalise their expected future bounty payments. The IDS was replaced in 1995 by a new package of budgetary measures known as the TCF 2000 Development Strategy, parts of which were not implemented by the incoming Howard Government.

The LAP was introduced to assist displaced workers gain employment outside the TCF industries. Participants received wage subsidies, training and relocation assistance for up to a year. The program was abolished in 1996.

Additional sector-specific budgetary assistance was provided through the Import Credit Scheme (ICS) and the Overseas Assembly Provisions (OAP) Program. The ICS was introduced to operate from 1 July 1991 to 30 June 2000 as a temporary measure to encourage TCF exports. The ICS provides exporters of eligible TCF products with credits which can be used to reduce the amount of customs payable on eligible TCF imports. In effect, it created an incentive to export by effectively subsidising overseas purchases of Australian TCF products.

The OAP Program was introduced in 1993 for three years for clothing manufacturers. It allowed firms to assemble clothing overseas from cut fabric made in Australia and then import the finished product to Australia free of duty on the Australian content. At least 85 per cent of the fabric used in the finished garment had to be made in Australia while the offshore content attracts duty at the normal rate. The program was extended to 2000 in the TCF 2000 Development Strategy.

The Commission has estimated that Commonwealth Government budgetary assistance to TCF firms from 1987 to 2000 for the above measures exceeded \$1 billion. (IC 1997c, p. 263)

Following the Industry Commission's 1997 TCF report the government announced that tariffs would continue to phase at their present rate of reduction until 2000, with no further reductions until 2005. The Government would legislate to reduce TCF tariffs on 1 January 2005 — to 17.5 per cent for clothing and finished textiles, to 10 per cent for cotton sheeting and fabrics, carpet and footwear and to 7.5 per cent for sleeping bags, table linen and footwear parts.

In 1998, the Government announced a \$772 million program of assistance for the TCF industries. The program has several components:

- assistance for strategic investment including new capital investment, R&D activities and product development expenditure for the period 1 July 2000 to 30 June 2005;
- regional adjustment assistance, including extension of the strategic investment program to purchase state-of-the-art second-hand plant and equipment for regional structural adjustment;
- an expanded OAP scheme to operate from 1 January 1999;
- a technology development fund to operate from 1 July 2000;
- funding for a national framework for excellence in TCF training from 1 July 2000; and,
- a market development fund.

As in other industries, TCF firms also receive assistance from generally available Commonwealth programs to promote research and development, exports and improved management practices. A variety of assistance measures are also available from state and local governments.

The level of assistance to the TCF industries has declined markedly since the introduction of the TCF Button Plan in 1989 (see figure 3.1). However, relative levels of assistance for the TCF industries compared with all manufacturing industries increased during the 1990s. In 1989-90, the effective rate of assistance for textiles was three and a half times that for the manufacturing sector and by 1996-97 it was four times that for manufacturing (IC 1995, PC 1998). The effective rate for clothing and footwear increased from seven and half times that of manufacturing in 1989-90 to almost eight times in 1996-97.

Nevertheless, absolute differences between the TCF industries and total manufacturing have declined considerably over the 1990s. For the textiles industry, the absolute difference fell from 38 to 19 percentage points between 1989-90 and 1996-97. For the clothing and footwear industries the absolute difference fell from 96 to 40 percentage points over the same period.

Industrial relations

The industrial relations framework has been a significant influence on the structure and performance of the TCF industries. Rigidities in determining wages and conditions inhibited enterprise flexibility and adaptability. Extensive demarcation and restrictive work practices impeded the adoption of new production techniques and the introduction of new technology and discouraged enterprise training.

In the late 1980s and in the 1990s a number of reforms were made to the industrial relations system. They included modification of the legal and institutional framework governing industrial relations, changes to awards to permit greater flexibility in labour use, reforms to encourage greater skill acquisition and efforts to reduce the segmentation of the labour market.

These changes have provided opportunities for TCF firms to change workplace arrangements and practices. For example, the *Workplace Relations Act* limits the power of a number of clauses and provisions relating to times worked that are in the current awards. The Act states that the Australian Industrial Relations Commission (AIRC) will not be able to set ratios or limit the number or proportion of employees working on a particular basis. Also, maximum and minimum hours cannot be set for part-timer employees except for minimum consecutive hours and provisions facilitating a regular pattern in hours.

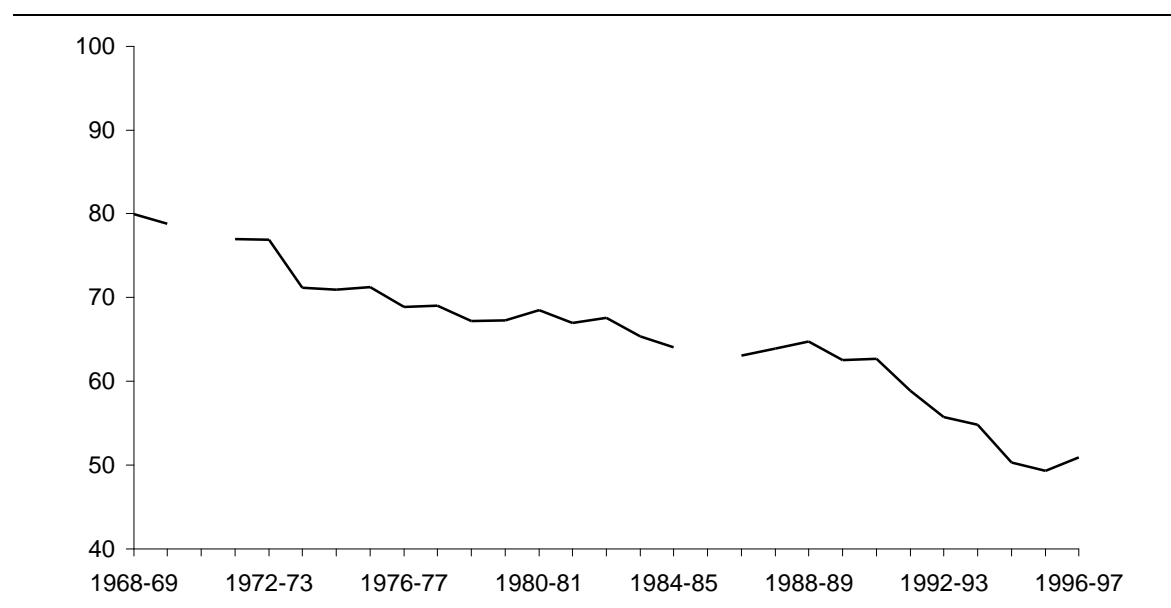
A number of TCF firms which have implemented an enterprise agreement reported in the 1997 TCF inquiry that workplace efficiency and productivity had improved. These improvements came primarily from achieving greater flexibility in skills usage (multi-skilling) and worktime (shift work and overtime arrangements). Major innovations and benefits identified by participants to the 1997 inquiry included quality-based team bonus payments, annualised hours and increased flexibility in weekly hours, upgrading and utilising new skills, improved workplace communications, productivity bonuses and temporary labour provisions, reduced union demarcation, and increased teamwork.

3.3 Increasing competition

The TCF industries have faced increasing competition from imports since the early 1970s with the growth of low cost production in the developing countries in South East Asia. The market share supplied by domestic production gradually declined throughout the 1970s and 1980s despite the high levels of assistance accorded the industries (figure 3.2). With the reduction of tariffs and the removal of quotas in the 1990s, import penetration increased sharply. The market share supplied by domestic production declined from 63 per cent in 1989-90 to 51 per cent in 1996-97.

The largest increase in imports between 1989-90 and 1996-97 occurred in the more highly labour-intensive activities— clothing, footwear and leather products (table 3.4).

Figure 3.2 **Domestic market share for the TCF industry, 1968-69 to 1996-97**
Per cent



Source: Commission estimates based on ABS data.

Table 3.4 **Domestic market shares for the TCF industry, selected years**

Per cent

| | 1968-69 | 1974-75 | 1979-80 | 1984-85 | 1989-90 | 1996-97 |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Textile fibres(221) ^a | 63.9 | 55.9 | 44.9 | 37.2 | 33.4 | 9.1 |
| excl. wool scouring | 64.9 | 58.3 | 51.2 | na | 46.5 | 38.9 |
| Textile product mfg (222) | 74.6 | 74.4 | 72.6 | 73.4 | 73.7 | 67.7 |
| Knitting mills (223) | 92.3 | 77.9 | 77.4 | 71.0 | 65.6 | 60.1 |
| Clothing mfg (224) | 93.0 | 77.8 | 79.6 | 77.1 | 77.7 | 62.9 |
| Footwear mfg (225) | 90.8 | 75.7 | 70.6 | 65.6 | 55.6 | 41.6 |
| Leather & leather product mfg (226) | 83.6 | 73.9 | 62.5 | 55.5 | 54.9 | 39.5 |
| All TCF (22) | 80.0 | 71.0 | 67.3 | 64.1 | 62.5 | 50.9 |
| excl. wool scouring | 80.1 | 72.2 | 69.8 | na | 64.5 | 53.4 |

^a An anomaly in the trade data caused by differences in classification between trade and production activities results in data for exports of the wool scouring industry exceeding industry sales. Exports increased by over 70 per cent for the wool scouring industry between 1989-90 and 1996-97, reducing the industry group's sales to the domestic market significantly. na - not available.

Source: Commission estimates based on ABS data.

3.4 Industry responses

Management culture

In the 1970s and 1980s when faced with increasing competition from imports the response by the TCF industries was to seek increases in protection. Governments were very responsive to the perceived needs of uncompetitive industries and an incentive structure was established which rewarded new proposals to fine tune protection arrangements. Each new crises brought about a new set of interventions.

People have had little option but to monitor and strive to influence decisions taken by the bureaucracy and government, so much so that virtuosity in manipulating assistance is a high priority for the exercise of entrepreneurial talents (IAC 1986, p. xiii).

The response in the TCF industries to the new arrangements introduced through the Button Plan was diverse. Parts of the sector developed a more positive, outward-looking attitude to change and competition. Many firms adapted, but others could not and ceased operating while others are still to adapt. However, the range of budgetary measures still available to the industry and the regular modifications to these measures during the 1990s indicates that many firms and managers still have expectations of extensive government involvement in the development of the TCF industries.

The switch from tariff protection to various forms of industry-specific subsidy and the availability of more general forms of assistance has encouraged a more outward-looking approach in parts of the sector. In a slowly growing domestic market, in which imports continue to increase, exporting has become an important strategy for many firms. TCF exports as a proportion of turnover increased from 4 per cent to 16 per cent between 1988-89 and 1996-97. However, the increase in exports appears to be highly concentrated. According to respondents to the 1995 Business Longitudinal Survey, the improved export performance was accounted for by less than 10 per cent of TCF firms (IC1997c, p. 10).

There has also been a significant increase in direct investment abroad in TCF industries. It has increased faster than for the manufacturing sector as a whole, albeit from a low base. Some TCF firms have become more focused on areas of comparative advantage by developing niche markets and placing greater emphasis on brand names.

Industry rationalisation

The overall size of the TCF sector declined in the face of increasing import competition. Clothing and textiles are the largest industries within TCF manufacturing accounting for around 50 per cent and 40 per cent respectively of TCF manufacturing value added. Both industries have experienced a considerable decline in their value added since the late 1980s.

Many firms were not able to overcome competitive disadvantages and ceased operating. Significant parts of the TCF industries have rationalised to achieve the scale necessary to make efficient use of new, labour-saving technology. This has occurred both within firms and through takeovers and mergers among firms (IC 1997c, p. 44).

In the late 1980s, there was substantial investment in restructuring by many firms. Major restructuring occurred in the cotton spinning industry with the establishment of several world class cotton spinning mills. The carpet industry also restructured through mergers, rationalisation of existing facilities and upgrading of plant and equipment. (TCFDA 1993)

Structural pressures and subdued demand forced clothing producers, particularly the larger ones, to develop new strategies more suited to their changing environment. These strategies generally involved rationalising all or some of their in-house operations by dual sourcing which involved local cut, make and trim manufacture and offshore supply (TCFDA 1993). Those companies which retained their own

production facilities tended to move to stand-up cellular manufacturing to give them flexibility for quick response.

Some firms took advantage of the funds available under the Industries Development Strategy between 1987 and 1995 to rationalise their operations. Out of 139 capital grant approvals under the scheme, only 15 were for rationalisation but they accounted for around half of the total IDS capital grant expenditure (IC 1997c p. 275).

While many firms have exited the industry, there have also been many new firms starting up. The number of TCF establishments increased during the 1990s (figure 3.3) across all TCF industry groups except knitting mills and footwear manufacturing (table 3.5). Associated with this increase has been a decline in average employment size of TCF establishments (figure 3.3). However, the extent of the change in the 1990s, and perhaps even its direction, may be questioned because of problems associated with the data collection.¹

Some TCF firms have improved their competitive position by integrating vertically or creating alliances with other firms at different stages of the production and distribution chain. The Carpet Institute of Australia noted a strong degree of integration in the carpet industry:

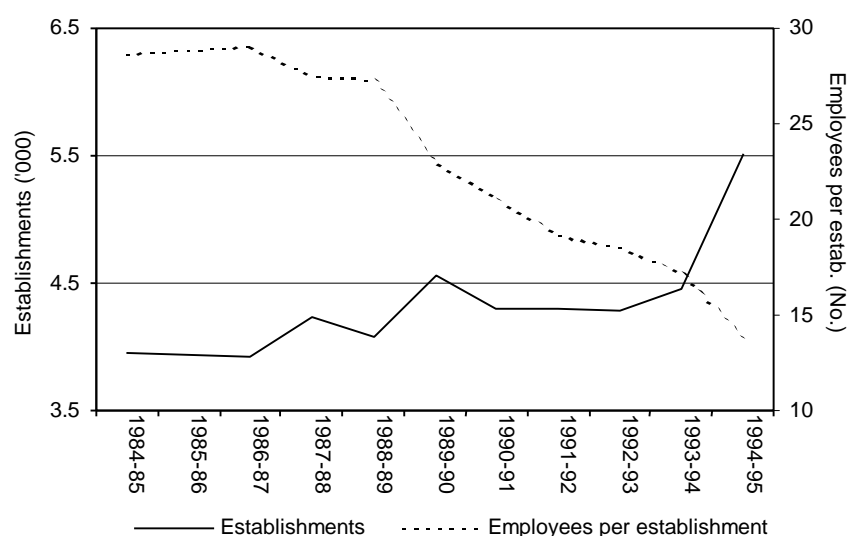
Six carpet manufacturers — Godfrey Hirst, Shaw Industries, Brintons, Victoria Carpets, Tascot Templeton Carpets and Tuftmaster Carpets — are vertically integrated, manufacturing all or part of their yarn requirements internally. (sub. 120, p10, cited in IC 1997c, p. 57)

In some cases, firms have integrated vertically in order to ensure continuity of supply and to improve the quality and efficiency of that supply. For example, Diana Ferrari acquired a component manufacturer which will act as an ‘arms length’ supplier to both Diana Ferrari and the trade at large (IC 1997c, p. 57). While stopping short of full integration, alliances may extend from raw material suppliers

¹ The years prior to 1989-90 do not include establishments with less than four employees. The inclusion of such establishments from 1989-90 accounts for part of the increase in total establishments and part of the decline in the average employment size. The ABS cautions against using the number of establishments as an analytical tool because it was subject to various and conflicting influences in the early 1990s (ABS 8221.0). The definition of “establishment” is the smallest accounting unit of a business controlling its productive activities and maintaining a specified range of detailed data. It does not necessarily represent a separate physical unit. The increase in establishments may reflect changes in accounting procedures within firms which result in changes in the “smallest accounting unit”. Part of the increase in establishments and the decline in average employment size may also be attributed to the improved coverage of the ABS business register in recent years, especially in relation to small businesses.

to manufacturers, through manufacturers at various stages of the production process, right through to retailers. At the opposite end of the value chain to raw materials, many manufacturers are establishing close relationships with retailers. Some TCF firms have established their own retail facilities, while others have developed closer links with existing retailers.

Figure 3.3 **TCF establishments and employees per establishment, 1984-85 to 1994-95^a**



^a Years prior to 1989-90 do not include data for establishments with fewer than 4 employees. Sole traders and partnerships with no employees are excluded in all years.

Source: IC (1997c).

Table 3.5 **Establishments by TCF industry group**

| ANZSIC industry ^a | 1977-78 ^b | 1984-85 ^b | 1994-95 | 1996-97 |
|-------------------------------------|----------------------|----------------------|-------------|-------------|
| Textile fibres(221) | 285 | 293 | 313 | 272 |
| Textile product mfg (222) | 556 | 567 | 1012 | 1040 |
| Knitting mills (223) | 365 | 328 | 227 | 236 |
| Clothing mfg (224) | 2014 | 2312 | 3515 | 4906 |
| Footwear mfg (225) | 271 | 233 | 162 | 256 |
| Leather & leather product mfg (226) | na ^c | 222 | 280 | 269 |
| All TCF (22) | | 3956 | 5509 | 6979 |

^a Data pre-1989-90 (ASIC) is concorded with data post 1989-90 (ANZSIC). ^b Years prior to 1989-90 do not include data for establishments with fewer than 4 employees. Sole traders and partnerships with no employees are excluded in all years. ^c na - not available.

Data source: DISR (1999b) and IC (1997c).

Specialisation

Until the removal of quotas in 1993, Australian TCF manufacturers produced a wide range of products. The removal of quotas encouraged firms to concentrate more on those areas in which they perceived some competitive advantage. However, the most recent Industry Commission report on the industries concluded that adaptation to a market without quota protection is yet to be completed (IC 1997c, p. 53)

Many successful Australian TCF companies have concentrated on developing high value niche markets. A large domestic market is not essential for manufacturers of higher value niche products — mass markets are only necessary for mass producers. However, it is difficult to determine the extent that this has occurred as there are still many firms producing ‘commodity’ type products.

In addition to this switch to niche markets, some TCF companies have been making the most of their production flexibility. The relative success of local production of female outerwear is partly due to the high fashion component, which requires short and constantly changing production runs. Local manufacturers are close to the market and are in a better position to respond to changing consumer demands.

The shift to the high fashion end of the market for female outerwear is an area that lends itself to contract manufacture, where homeworkers are used extensively for assembly. The relative low cost of homework may have contributed to the competitiveness of women’s wear manufacturing against imports.

Some firms have pursued specialisation by contracting out. Many TCF firms have contracted-out part of their activities previously undertaken by the firms employees. Almost 20 per cent of clothing firms engaged in some form of contracting-out in 1994-95, compared with 8 per cent for total manufacturing (IC 1997c, p. 54). The increased use of contractors may be related to the perceived increase in the use of homeworkers in the TCF industries, particularly the clothing industry. In many cases, contracting-out has extended to obtaining inputs from overseas.

Some evidences of increasing product specialisation is provided by the increase in the intra-industry trade (IIT) index. The IIT index is a measure of two-way international trade within the same industrial product classification. If a country exports roughly the same amount of goods within the same classification as it imports, the IIT index will high, indicating a high degree of specialisation. However, if there is mainly one way trade, that is, imports with no exports or vice versa, the IIT index will be low, indicating low levels of specialisation. There was a slight increase in overall TCF intra-industry trade (figure 3.4), mainly due a decline in wool scouring exports which account for a large part of total exports. The fall in wool scouring exports diluted the impact of a marked increase in two way trade in

all other industry groups. The increase in the IIT ratios for other TCF industries suggests that Australian TCF manufacturers in all industry groups are restructuring to focus on areas of comparative advantage.

Technology

There are some indications that TCF companies, particularly in capital-intensive activities, are placing greater emphasis on investing in modern technology as exposure to international competition has increased over the last decade. This highlights the increasing importance of investment aimed at modernising production facilities relative to investment that expands capacity.

The level of technology employed in the capital-intensive segments of the industry, including wool scouring, spinning, weaving, knitting, carpet production and tanning, are comparable with firms elsewhere in the world. For example, the Carpet Institute of Australia said that:

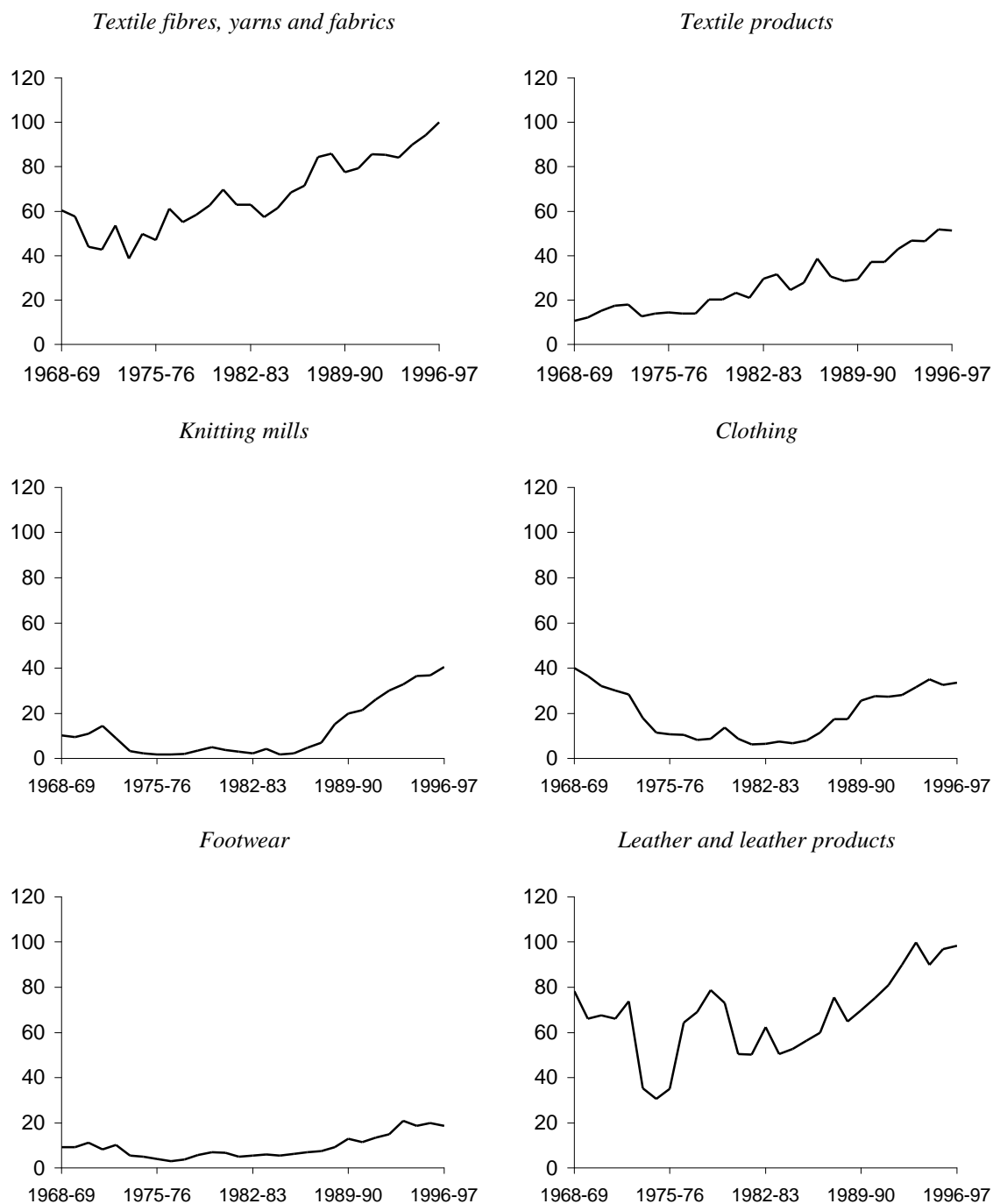
The level of technology employed by the leading tufted and woven carpet manufacturers is directly comparable to the technology employed by leading overseas carpet manufacturing firms. The Australian industry has strong technology links with overseas manufacturers. (sub. 120, p.5-6. cited in IC 1997c, p. 31)

There has also been increased adoption of new technology in the clothing industry, including programmable sewing machines, computer-aided design and computer numerically controlled cutting systems, electronic data interchange and modern warehousing and distribution systems.

The rate of adoption of advanced technology was low by manufacturing standards. In the period from July 1994 to July 1997, only 18.5 per cent of TCF businesses had acquired at least one advanced manufacturing technique compared with 24 per cent of businesses for the manufacturing sector (table3.6). The rate of take up was amongst the lowest of manufacturing industries.

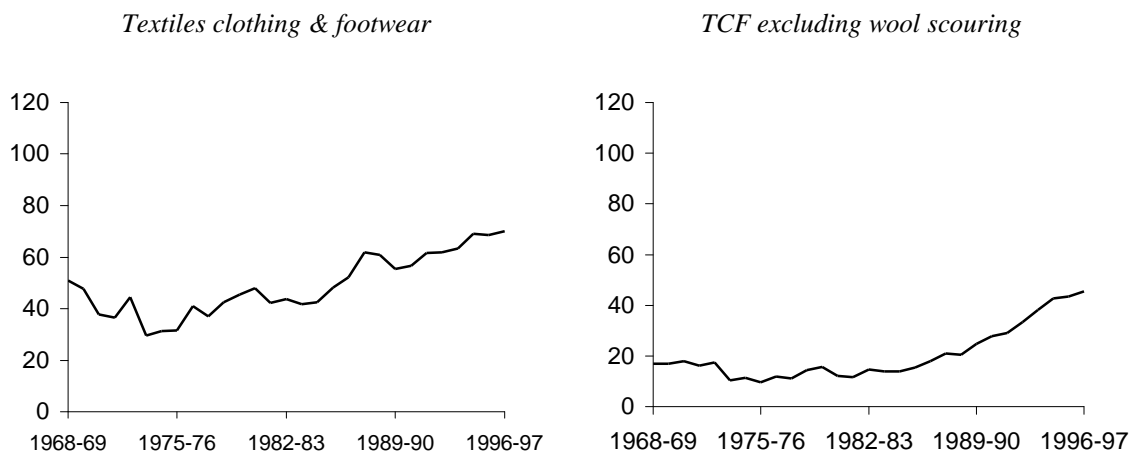
Adoption of advanced technology was more common in TCF businesses with 10 or more employees. The proportion of these businesses which had adopted advanced manufacturing technology between 1994 and 1997 was 36 per cent, almost double that for the sector as a whole (table3.7). Still, the rate of adoption was significantly lower than that for the manufacturing sector as a whole.

Figure 3.4 Intra-industry trade index by TCF industry group, 1968-69 to 1996-97



(Continued on next page)

Figure 3.4 (continued)



Source: Commission estimates based on ABS data.

There was also a significant increase in the adoption of advanced technology in the larger businesses between 1988 and 1996-97 from 20 to 36 per cent. The increase appears to be accounted for largely by increased use of advanced technology in the clothing and footwear industries. For example, the increase in the proportion of businesses using advanced technology between 1988 and 1991 was entirely due to increased adoption in the clothing and footwear industries (ABS 8123.0).

Table 3.6 **Proportion of businesses with any advanced manufacturing technology^a**

Per cent

| | 1996-97 | Expected by 1998-99 |
|--|---------|---------------------|
| Textiles, clothing, footwear and leather | 18.5 | 26.6 |
| Total manufacturing | 24.0 | 36.0 |

^a Advanced manufacturing technology covers: design and engineering; fabrication, machining and assembly; automated material handling; automated inspection and/or testing equipment; and communications and control.

Data source: ABS 8116.0

Table 3.7 **Percentage of businesses with 10 or more employees with advanced manufacturing technology by industry**

Per cent

| | 1988 | 1991 | 1996-97 | Expected by 1998-99 |
|-------------------------------|------|------|---------|---------------------|
| Textiles, clothing & footwear | 20 | 30 | 36 | 46 |
| All manufacturing | 33 | 41 | 44 | 57 |

Data source: ABS, unpublished data.

More generally, technological innovation in the TCF industries appears to have declined in recent years. Between 1991 and 1994, 28 per cent of TCF businesses undertook some form of technological innovation. This declined to 15 per cent for the period 1994 to 1997 (table 3.8). The proportion of TCF businesses undertaking technological innovation between 1994 and 1997 was the lowest of all manufacturing industries.

Table 3.8 Technological innovation in manufacturing, 1994 and 1997
Per cent

| <i>Industry subdivision</i> | <i>Proportion of businesses undertaking one or more technologies</i> | |
|---------------------------------|--|-------------|
| | <i>1994</i> | <i>1997</i> |
| Textiles, clothing and footwear | 28.2 | 15.4 |
| Total manufacturing | 32.2 | 26.0 |

Source: ABS 8116.0, unpublished revision for 1994.

Research and development

TCF R&D increased significantly between the late 1980s and 1994-95, in both absolute terms and as a proportion of gross product (table 3.9). Since then, however, it has declined. Expenditure on R&D in the TCF industries as a proportion of gross product is significantly lower than that for total manufacturing. While the TCF industries account for 5 per cent of manufacturing gross product, they account for less than 2 per cent of manufacturing R&D.

Most R&D undertaken by the TCF industries seems to be in the form of experimental development, using existing knowledge gained from research or practical experience to develop new or improved products and processes. Many parts of the industries, particularly textiles and apparel, place a great deal of emphasis on design. Generally, expenditure on design does not attract government assistance such as the 125 per cent R&D tax concession and is excluded from official estimates of R&D expenditure. R&D activity as defined by the ABS does include activity which results in new or improved products, but the work must be experimental and must involve innovation or technical risk.

Table 3.9 **Business expenditure on R&D, for the TCF industry and total manufacturing, 1984-85 to 1996-97**
\$1994-95

| | <i>TCF</i> | | <i>Manufacturing</i> | |
|---------|----------------|------------------------------------|----------------------|------------------------------------|
| | <i>R&D</i> | <i>Proportion of gross product</i> | <i>R&D</i> | <i>Proportion of gross product</i> |
| | \$m | % | \$m | % |
| 1984-85 | 8.73 | 0.23 | 685.94 | 1.23 |
| 1986-87 | 17.53 | 0.43 | 952.71 | 1.65 |
| 1988-89 | 9.12 | 0.22 | 1 074.52 | 1.65 |
| 1990-91 | 15.99 | 0.44 | 1 216.57 | 1.92 |
| 1991-92 | 18.04 | 0.52 | 1 392.15 | 2.26 |
| 1992-93 | 16.85 | 0.51 | 1 751.37 | 2.80 |
| 1993-94 | 18.57 | 0.52 | 1 774.12 | 2.64 |
| 1994-95 | 28.00 | 0.81 | 1 931.60 | 2.88 |
| 1995-96 | 24.65 | 0.54 | 2 244.77 | 3.80 |
| 1996-97 | 20.21 | 0.65 | 2 182.80 | 3.61 |

Source: IC (1997c) and Commission estimates based on ABS data.

Management and work organisation

Management practices

Many TCF firms have sought to implement new management practices but this has not happened across the board and the quality of management appears to differ considerably between firms. The successful, efficient and world competitive firms have introduced strategies such as benchmarking, quick response production, and just-in-time inventories.

Another response by the TCF industry to their changing environment was to adopt better responses to retailers needs. Virtually all successful firms appear to have moved closer to their customers, often through the adoption of 'quick response' techniques such as just-in-time inventory controls. Manufacturing flexibility has been supported by the adoption of just-in-time delivery and electronic data interchange. The adoption of a quick response approach to manufacturing greatly assists domestic manufacturers in competition with imports by increasing their ability to service retail customers.

It is difficult to gauge the extent of adoption of new management practices. An ABS survey (ABS 8123.0) of the use of management techniques shows that 24 and 20 per cent of textile and clothing and footwear establishments respectively were using Total Quality Control/Management, compared to 24 per cent for the manufacturing

sector. Some 27 per cent of textile establishments and 20 per cent of clothing and footwear establishments were using Just-in-time compared to 22 per cent of all manufacturing establishments. However, planned use of these techniques for the following two to five years was low. The ABS survey was discontinued and more recent data on a comparable basis for the adoption of new manufacturing techniques is not available.

Between 1992-93 and 1994-95, less than 10 per cent of TCF firms introduced some form of business improvement activity, compared with the manufacturing average of 18 per cent (IC 1997c, p. 47).

Work practices

Enterprise agreements are relatively rare in the TCF industries but appear to be more common in the larger textiles companies which are more capital-intensive than other sections of the industry (IC 1997c, p. 101).

Many TCF firms have implemented enterprise agreements to improve workplace practices, although their success has been mixed. The TCF Union of Australia noted that some employers were resisting entering into certified agreements or even enterprise flexibility agreements (sub. 128, p.17 cited in IC 1997c, p. 102). On the other hand, some industry participants to the 1997 inquiry argued that their employees and the union were resistant to negotiations or that negotiations were simply a vehicle for furthering higher pay demands. Other participants thought that potential benefits of enterprise bargaining would be insignificant or not worthwhile. In addition, some small firms, which have agreements, state that they were currently unhappy with the bargains they made, especially in relation to redundancy provisions (IC 1997c, p. 102).

Skill development

Increased competitive pressures and structural changes in the TCF industries have increased the need for the workforce to acquire new skills and maintain existing ones. Although several participants to the 1997 inquiry criticised the historical lack of a training culture in the TCF industries, some parts of the industries have increased their training effort, within their own firms and through industry-wide initiatives.

A relatively high proportion of the labour force of the TCF industries is in low skilled occupations. TCF employees have less formal education than employees in the rest of the manufacturing sector. However, the proportion of the TCF workforce

which has completed the highest secondary level increased from 10 to 17 per cent between 1984 and 1997 while the proportion with post-school qualifications increased from 19 to 32 per cent (table3.10).

Table 3.10 Educational attainment of TCF industries workforce, selected years
Per cent

| | 1984 | 1990 | 1997 |
|--|------|------|------|
| With post-school qualifications | | | |
| TCF | 18.8 | 25.3 | 31.8 |
| Manufacturing | 39.6 | 43.4 | 45.9 |
| Without post-school qualifications | | | |
| Completed highest secondary level | | | |
| TCF | 9.6 | 15.5 | 16.8 |
| Manufacturing | 10.6 | 14.9 | 15.4 |
| Did not complete highest secondary level | | | |
| TCF | 71.6 | 59.2 | 51.4 |
| Manufacturing | 49.8 | 41.7 | 38.7 |

Source: Commission estimates based on unpublished ABS data.

Capital and labour inputs

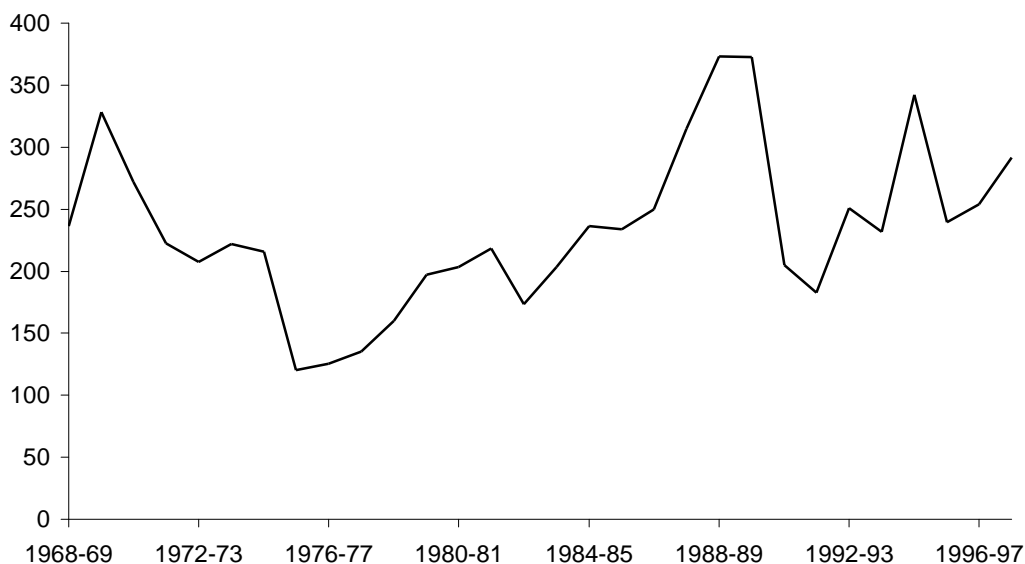
Investment

New capital investment in the TCF industries has fluctuated broadly in line with that of total manufacturing over the decade to 1995-96 (IC 1997c, p. 26). A large increase in capital expenditure occurred in the late 1980s but fell sharply in the early 1990s and has recovered since then (figure3.5). While investment in the 1990s has not reached the peaks of the late 1980s, it has been generally higher in the 1990s than in the 1970s and the first half of the 1980s. The textiles and leather industries account for most of the new capital investment in the sector (IC 1997c, p. 26).

Net capital stock of the industry increased by nearly 20 per cent between 1987-88 and 1990-91. Since then there has been little change and is at a level similar to that of twenty years ago, although above that maintained for much of the 1980s (IC 1997c).

Figure 3.5 Private new capital expenditure for the TCF industries, 1968-69 to 1997-98

\$1989-90, \$million



Sources: Commission estimates based on ABS 5625.0 and unpublished ABS data.

Employment

Employment in the TCF industries declined steadily from the mid-1970s under the pressure of increasing competition from overseas suppliers. Once protection was reduced, competitive pressures intensified and firms implemented further reductions in employment as they restructured operations to improve their competitive position.

Since 1989, TCF employment has declined by about 25 per cent (table 3.11). Declines occurred in all industries except leather and leather products. The largest reduction occurred in the clothing industry, where there was a decline of 16 200, or 31 per cent from 1989-90 to 1997-98. The largest proportionate decreases were in knitting mills, textile fibres, yarn and woven fabric manufacturing and footwear manufacturing.

Table 3.11 TCF employment, selected years

| | 1974-75 | 1984-85 | 1989-90 | 1997-98 |
|------------------------------|---------|---------|---------|---------|
| | No. | No. | No. | No. |
| Textile fibres | 28 672 | 21 700 | 17 200 | 12 140 |
| Textile products | 14 334 | 11 500 | 12 500 | 12 863 |
| Knitting Mills | 11 000 | 7 900 | 8 000 | 7 043 |
| Clothing | 65 184 | 54 000 | 52 100 | 35 901 |
| Footwear | 14 248 | 12 600 | 10 000 | 5 798 |
| Leather and leather products | 5 949 | 3 800 | 3 100 | 3 656 |
| TCF | 139 869 | 111 500 | 102 900 | 77 402 |

Source: IC (1995b) and ABS 8221.0.

The extent of the reduction in employment may be overstated as homeworkers are not included in employment statistics for the industry. TCF homeworking in Australia occurs mainly in women's fashion apparel and other clothing. Other areas of TCF manufacturing which sometimes use homeworkers are footwear uppers, knitted textiles, soft furnishings, manchester and outdoor wear.

It has been suggested that the clothing industry's demand for homeworkers has increased significantly in Australia over the past decade. The *Senate Economics References Committee Inquiry in Outworking in the Garment Industry* concluded that in the clothing industry manufacturing has moved from a factory based workforce to homeworkers. The IC estimated from data supplied to the inquiry that the current extent of homeworking in the clothing industry was equivalent to around 23 000 full-time workers. Given that the majority of homeworkers are thought to be working intermittently rather than full-time, it was not possible to calculate the total number of people performing TCF homework (IC 1997c, pp. 121-122).

There was a large decline in recorded low-skilled employment in the clothing industry. Several participants to the 1997 TCF inquiry claimed at least part of this decline has been offset by an increase in the use of homeworkers in clothing and, to a lesser degree, other TCF industries.

Such an increase in demand for clothing homeworkers may be questioned in view of increasing price pressures on the sector as a result of international competition and a continuing long-term shift in retail spending patterns away from clothing (as a proportion of household income). Some aspects of regulation of working conditions in factories were also likely to have had some influence. Demand for clothing homeworkers may have also been influenced by recent developments in the structure of the fashion apparel supply chain which place increasing importance on quick response times, product differentiation and flexibility in supply. For clothing manufacturers who have transferred production offshore, local homeworkers can be

used to top up repeat orders quickly or add items to a range of products as required. (IC 1997c, p. 121)

Participants to the 1997 TCF inquiry stated that other common TCF products such as socks, hosiery, most underwear and all textiles and fabrics not made by homeworkers, were better suited to large scale capital-intensive production. (IC 1997c, p. D.2)

A further response to increased competition has been an increase in the proportion of casual labour in the TCF industries. Between 1986 and 1996, the proportion of casual employment more than doubled. This increase is higher than the increase for total manufacturing and considerably higher than for the economy as a whole.

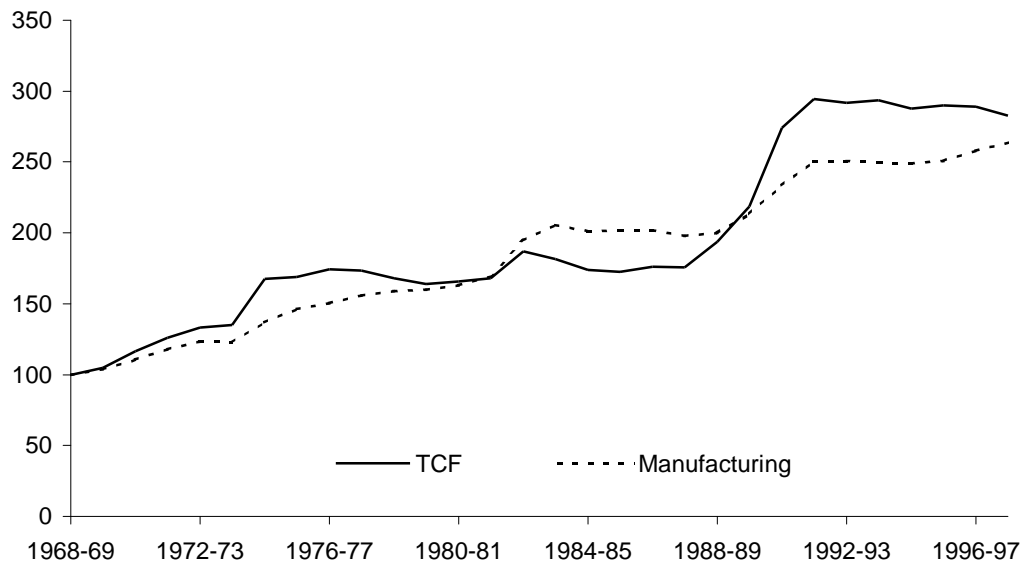
Capital/labour ratio

Between 1987-88 and 1991-92, there was a very large increase in the capital/labour ratio for the TCF industry (figure 3.6). It increased by 13.8 per cent per year compared to 6.1 per cent per year for the manufacturing sector over the same period. Prior to then, there had been little change in the ratio over many years. For example, it increased by only 0.8 per cent per year between 1980-81 and 1987-88 while the manufacturing ratio increased by 2.8 per cent per year. Since 1991-92, the TCF capital/labour ratio has declined slightly while that for manufacturing has increased a little.

The sharp increase in the capital/labour ratio was the result of both the large increase in investment and the large decline in employment in this period. Since 1991-92, there was little change in the capital/labour ratio because of reductions in both employment and net capital stock, the latter declining because of increased depreciation on the earlier investment peak.

Figure 3.6 **Net capital stock per employee in the Textile, clothing and footwear industries and the Manufacturing sector, 1968-69 to 1997-98**

Index 1968-69 = 100



Source: Commission estimates based on ABS data.

3.5 Productivity performance

There are difficulties in the measurement of productivity in the TCF industry because of the increasing use of part-time employment and homeworkers in the industry. An increasing proportion of part-time employment in the labour force of an industry could cause productivity growth to be under-estimated because it is calculated on the basis of the total number of employees. While hours worked can be used to measure labour input, employment classification differences in the ABS surveys used to collect hours worked and total employees add to the measurement difficulties. Increasing use of homeworkers may cause measured productivity growth to be over-estimated because homeworkers are not included in employee numbers or hours worked in an industry while their output contributes to the value added. However, the extent of the impact on measured productivity may be dampened by the accounting for changes in costs which, in turn, affect measured value added.

Multifactor productivity

MFP for the TCF industries grew steadily throughout the 1970s and until the mid-1980s (figure 3.7). Between 1981-82 and 1988-89, MFP in TCF industries

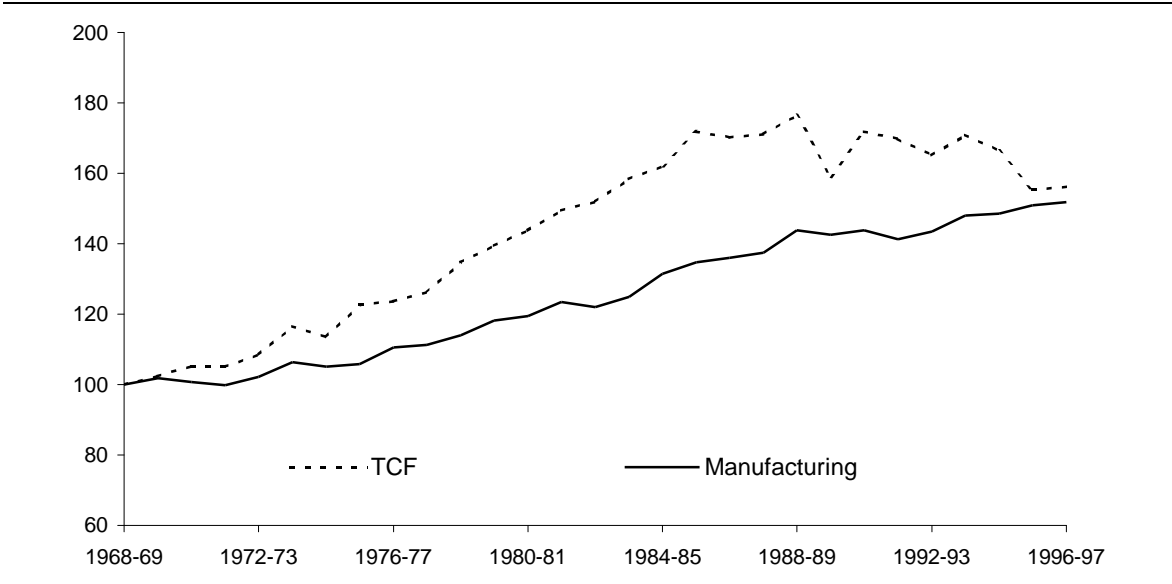
increased by 2.4 per cent per annum but declined by -1.5 per cent per annum between 1988-89 and 1996-97. MFP growth in the TCF industries exceeded that for manufacturing from the late 1960s to the mid-1980s. Since then, MFP has declined while manufacturing MFP continued to grow. There seems to be a clear turning point in MFP performance around 1985-86, which is well prior to the implementation of the program of reductions in protection.

Changes in input use don't appear to have been a major factor in accounting for the difference in MFP performance in the two periods. Between 1981-82 and 1988-89, there was little change in inputs. Net capital stock increased by 0.9 per cent per year over the seven years and aggregate hours worked declined by 0.8 per cent per year. While it is possible efficiency in input use increased in this period, this seems unlikely given the Industries Assistance Commission inquiry in 1986 which pointed to a range of sources of inefficiency in the sector.

In the following period, net capital stock increased by a similar amount (0.7 per cent per year) and hours worked declined at the high rate of 4.2 per cent per year, yet productivity declined. While there may have been some inefficiencies associated with the increase in capital stock, the expansion was small and does not seem to be the critical factor in the reversal of MFP performance.

Figure 3.7 Multi-factor productivity for the TCF and manufacturing industries, 1968-69 to 1996-97

Indexes 1968-69 = 100



Data source: Gretton and Fisher 1997 and Commission estimates for 1995-96 and 1996-97.

It is output effects which appear to have been the dominant influence on productivity performance in the sector. Between 1981-82 and 1988-89, output

increased by 2.0 per cent per year but, in the following period, output declined by 3.7 per cent per year.

In the former period, private final consumption expenditure on clothing and footwear increased in real terms and domestic output increased in response to the large increases in protection (IAC 1986b). Almost all the expansion of output occurred in the period in which protection was increasing.

Another influence on the growth of output may have been some substitution of increased output for quality through the influence of import quotas on product mix. The base quota system tended to encourage a shift in import patterns towards higher unit value goods and provide greater protection of domestic production of lower unit value goods. However, these incentives were muted somewhat by the introduction of partial sale of quotas by tender and the overall impact on the pattern of domestic production and imports is difficult to determine.

Labour productivity

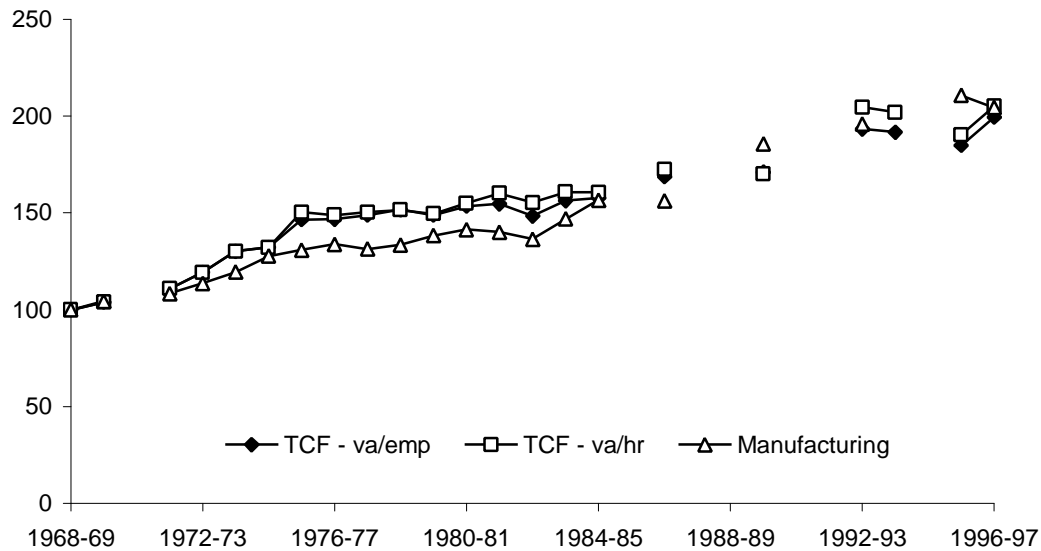
Labour productivity has been measured at both the aggregate and the 3-digit ANZSIC level. Figure 3.8 shows labour productivity measured as value added per hour worked and value added per employee between 1968-69 to 1996-97 for the TCF industries as a whole. Labour productivity by both measures improved only marginally in the 1990s compared with the 1980s.

Labour productivity growth in the TCF industries was quite modest from the mid-1970s and through the 1980s. A sharp increase in growth occurred in the early 1990s but was not sustained. Labour productivity growth (per hour worked) in the 1990s was 1.8 per cent per year, which was slightly higher than that for the 1980s at 1.6 per cent per year. Overall, the level of labour productivity has increased by about 50 per cent since the mid-1970s.

Productivity growth measured as value added per hour worked increased in the textile industries during the 1990s but not in the clothing industry (figure 3.9, table 3.12). A large increase was recorded in knitting mill productivity, but this forms a very small proportion of the clothing industry. A significant increase was also achieved in the textile products industry.

Figure 3.8 Labour productivity in the TCF industries and total manufacturing, 1968-69 to 1996-97

Indexes, 1968-69 = 100



Source: Commission estimates based on ABS data and Gretton and Fisher (1997).

Table 3.12 Annual average growth^a in value added^b per employee and per hour worked^c

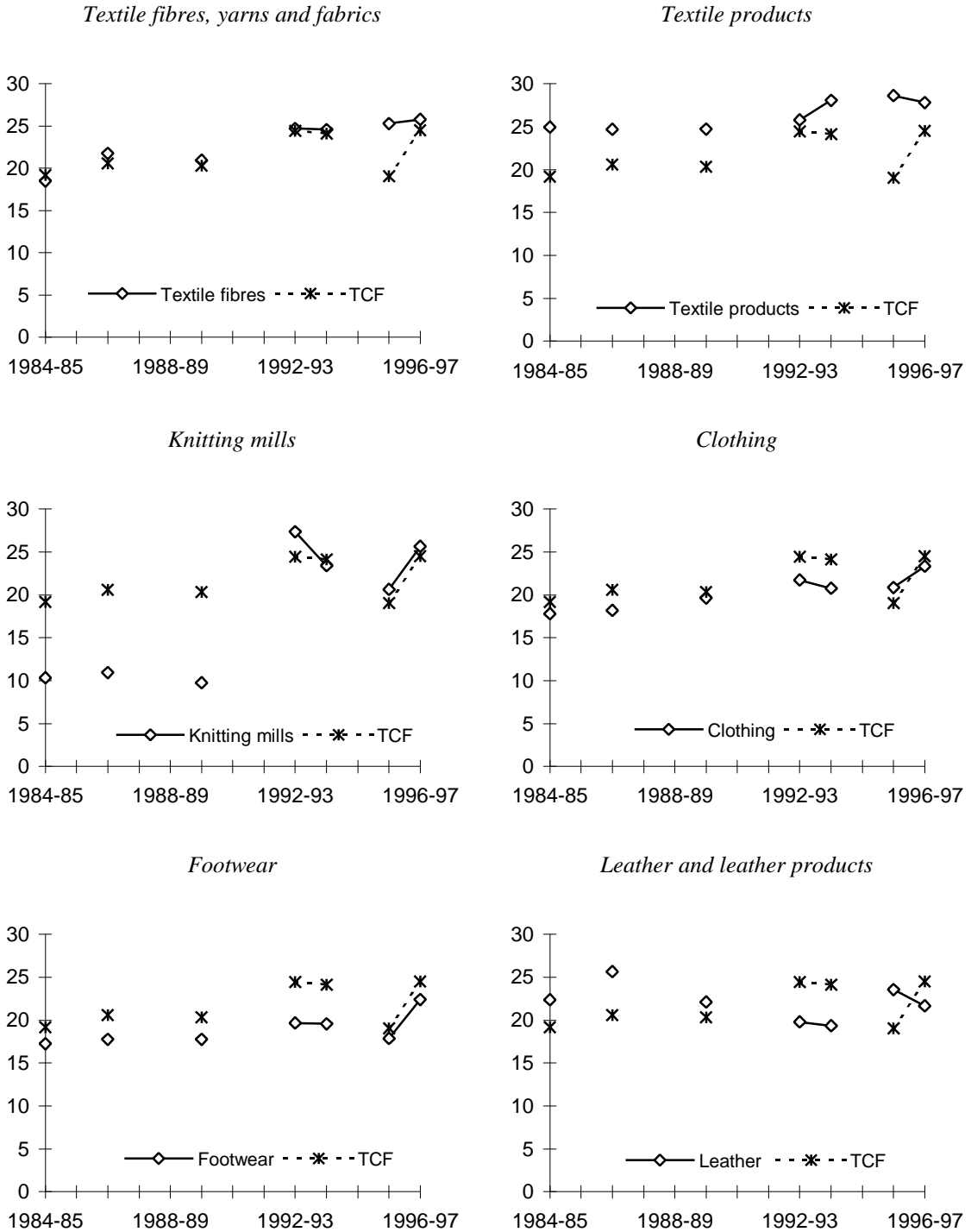
| ANZSIC industry | 1970s | 1980s | 1990s |
|-----------------------------------|-------|-------|-------|
| Textile fibres, yarns and fabrics | | | |
| Per employee | 4.0 | 2.5 | 2.0 |
| Per hour worked | na | 2.3 | 2.9 |
| Textile products | | | |
| Per employee | 2.5 | 2.0 | -1.2 |
| per hour worked | na | 0.2 | 1.9 |
| Knitting mills | | | |
| per employee | 2.8 | 0.6 | 5.9 |
| per hour worked | na | 1.4 | 11.6 |
| Clothing | | | |
| per employee | 4.2 | 1.2 | 1.9 |
| per hour worked | na | 2.0 | 2.0 |
| Footwear | | | |
| per employee | 3.4 | 1.9 | 0.8 |
| per hour worked | na | 0.8 | 1.9 |
| Leather and leather products | | | |
| per employee | 4.6 | 1.6 | 2.0 |
| per hour worked | na | -0.8 | 0.3 |

^a Estimates are based on a log-linear growth rate. ^b Value added is measured in constant 1989-90 prices.

^c Aggregate hours worked is based on labour force survey of employment. This differs from the aggregate hours worked series used for figure 3.8 which is based on the manufacturing census. na - Not available.

Source: Commission estimates based on ABS data and Gretton and Fisher (1997)

Figure 3.9 TCF industry value added per hour worked, 1984-85 to 1996-97
 \$1994-95 per hour



Source: Commission estimates based on ABS data.

3.6 Reductions in protection and productivity

The TCF industries have faced increasing competition from low-wage sources of production for much of the past thirty years. Increases in protection for much of this time enabled the TCF industries to avoid adjustment to become more internationally competitive.

The phased reductions in protection implemented from the late 1980s gave greater effect to the burgeoning competition from South East Asian countries. The share of the domestic market supplied by local producers fell from 63 per cent in 1989-90 to 51 per cent in 1996-97, the fastest change in import penetration in the sector for the last thirty years. The increase in import share coincided with the first reductions in protection under the Button Plan and it increased further immediately after the abolition of quotas in 1993.

The productivity response to the changes in protection and the increased imports was poor. MFP declined and there was only a small increase in the rate of labour productivity growth.

The poor response was not general across the TCF sector. At the firm level, many producers across all TCF industries made significant adjustments. But, many others have yet to adjust to the new circumstances.

Australia has developed a polarised group of TCF firms. At one end of the spectrum, there are efficient, world-competitive firms which have discovered specialised market niches, compete with imports or export a large proportion of their output. However, at the other end of the spectrum, there are still many highly protected manufacturers producing for the domestic market, using largely imported (often duty-free) inputs. This polarisation is, in part, the legacy of a highly distorting assistance regime, with rates of assistance varying greatly across productive activities. (IC 1997c, p. 46)

Productivity growth measured as value added per hour worked increased in the textile and footwear industries during the 1990s but not in the clothing industry.

There is little evidence of any major shift in resources between the TCF industries in response to the reduced disparities in assistance. The textile fibre industry is the most lightly assisted part of the TCF sector. Its output declined in the 1990s and its overall share of TCF output has remained stable. There was little change in output shares of the other TCF industries.

Notwithstanding the positive response by many producers to the significant increase in import competition, the overall poor productivity performance following the reductions in protection remains to be explained.

One possibility is that the gains from the reforms are yet to flow through. Import quotas were a major source of protection from import competition and were only abolished in 1993. However, the abolition of quotas in other industries (for example, whitegoods and automobiles) brought a more rapid response in terms of labour productivity performance than in the TCF industries.

A more likely reason is that the extensive range of budgetary assistance and adjustment measures made available to improve competitiveness of the industries, may have reduced the incentive for productivity improvement. For example, the large amounts of export assistance to improve the competitiveness of the local industry on the world market could have obviated the need for productivity improvement as a means to improved competitiveness. It is to be noted that the largest increases in exports were achieved by the most highly assisted, least capital-intensive and lowest productivity growth TCF industries. Another example of the assistance that was available for the industry to adjust was the Industry Development Strategy and the Labour Adjustment Package.

The availability of significant levels of budgetary assistance, while seen as necessary for managed adjustment in the sector, may have also compounded traditional entrepreneurial expectations about government assistance. The sector continued to devote considerable resources to lobbying government to slow down the rate of adjustment to import competition and to provide alternative instruments of assistance to maintain competitiveness. The TCF industries were not faced with a shock to entrepreneurial expectations. The industry was not forced to be self-reliant as there is still multi-dimensional assistance available.

In addition, TCF firms received assistance from generally available budgetary measures such as the Enterprise Improvement Program, the 125 per cent tax concession for research and development, the International Trade Enhancement Scheme, the Concessional Loans Program and accelerated depreciation provisions. Not all of these are readily quantifiable and most are not included in the measurement of effective rates of assistance.

Another factor may have been the increase in relative levels of assistance available to the TCF industries despite the very large absolute reduction in protection which occurred during the 1990s. Reductions in assistance to other manufacturing industries and the increase in certain budgetary assistance to the TCF sector resulted in higher relative levels of assistance for the TCF industries. This would have affected decision-making about the allocation of resources between the TCF and other manufacturing industries and may have inhibited productivity-enhancing decisions.

However, the large reductions in assistance to the TCF industries did narrow the relativities between them and non-assisted industries. The net impact on resource allocation and productivity growth depends on the degree of substitution in resource use between TCF industries and other manufacturing industries, on the one hand, and between TCF and non-assisted industries, on the other. The low TCF productivity response suggests that the relative levels of assistance within the manufacturing sector remain an important influence on decision-making about the allocation of resources.

The shift from low-skilled standardised products to high fashion end niche markets is another possible reason for the low productivity growth in the 1990s. This compositional shift may not have necessarily improved productivity performance, but has improved the allocation of resources within the industry.

Mechanisms of productivity improvement

In those parts of the sector which adapted to the new assistance regime, the measures adopted by firms to improve their competitiveness varied. Rationalisation and specialisation were the most important mechanisms of change. Firms rationalised to concentrate on those areas such as high value niche markets where they perceived that they have some form of advantage. There was also greater emphasis on investing in new technology and adopting new management and work practices.

Of those firms which appear to be adapting well, there does not appear to be a single formula for success. Many industries, such as cotton spinning and carpet manufacturing, have rationalised. There has been increasing specialisation as firms focus on areas of competitive advantage. Some firms have placed greater emphasis on brand names, while others became generic manufacturers. A number of firms have invested substantially in updated technology. New management approaches have been implemented - quick response production, alliance formation, product and process quality, identification of market niches, benchmarking and training are all becoming increasingly common. (IC 1997c, p. 1)

4 NSW rail freight operations

In the 1980s State Rail's productivity performance was impeded by serious structural and organisational problems. These problems were well known to management and had been the subject of numerous consultants' reports. However it was not until microeconomic reforms fundamentally changed State Rail's operating environment that management was able to tackle longstanding sources of inefficiency systematically.

An analysis of the productivity performance of NSW rail freight — based on partial productivity indicators — suggests that some impressive gains in productivity have been achieved since the late 1980s.

Pressure to improve the efficiency of NSW rail freight has come from a variety of sources including microeconomic reforms; demand pressures; technological change; and competition from road transport. Microeconomic reforms appear to have made a substantial contribution to the improved productivity performance of NSW rail freight by being the catalyst for wideranging structural and operational changes.

Some of the benefits of improved productivity have flowed through to rail freight customers in the form of lower freight rates and higher levels of service. NSW taxpayers have benefited through the elimination of operating deficits, the payment of dividends and reduced community service obligation (CSO) payments.

This case study examines the links between reforms — as introduced — and the improved productivity performance of NSW rail freight evident over the last decade. The case study does not attempt to assess or comment on the approach to reform in the NSW rail sector or on what further reforms may be required. These are issues considered in the Productivity Commission's inquiry into the rail industry *Progress in Rail Reform*.

4.1 Background

NSW government rail freight operators

This case study covers the period 1980-81 to 1997-98. For most of this period the old State Rail Authority of NSW (StateRail) was the government operator of rail freight services in NSW. On 1 July 1996 the NSW rail network was restructured and the Freight Rail Corporation (trading as FreightCorp) was created as the NSW government's new rail freight operator.

State Rail was established in 1980 as a statutory body — under the provisions of the *Transport Authorities Act 1980* — subject to the direction and control of the NSW Minister of Transport. State Rail was a vertically integrated railway with operations covering: passenger and freight services; the construction and maintenance of track, stations, yards and terminals; and signalling, communications and scheduling.

From 1988-89 State Rail's operations were commercialised under the provisions of the *Transport Administration Act 1988*. As part of the commercialisation process rail freight operations were established as a separate business group (FreightRail) within State Rail — on a vertically integrated basis.

On 1 July 1996 the NSW rail network was formally restructured. As part of the restructure FreightCorp was created as a NSW government owned statutory corporation. FreightCorp operates rail freight services within NSW and more recently on a national basis. As a rail operator FreightCorp is responsible for providing 'above rail' services and not for the track network. The Rail Access Corporation owns the track and related infrastructure and charges FreightCorp an access fee. In addition to rolling stock FreightCorp operates a number of yards, terminals and maintenance centres throughout metropolitan and rural NSW.

The nature of the NSW rail freight task

The NSW rail freight task is dominated by the transportation of bulk commodities — coal, grain and raw and semi-processed minerals. In 1997-98 coal and grain accounted for 92 per cent of the total tonnage hauled by FreightCorp. FreightCorp also hauls a wide range of general freight including: primary produce, manufactured goods and import and export containers. The users of rail freight services in NSW include mining companies, the Australian Wheat Board, primary producers, manufacturers, heavy industry and shipping companies.

NSW rail freight operations are largely geared to transporting bulk commodities to port for export. In 1997-98 around 90 per cent of total freight tonnage hauled by FreightCorp was destined for export.

As well as the haulage of freight within NSW rail is also used to transport freight interstate. Interstate rail freight services link Sydney with other capital cities (Brisbane, Melbourne, Adelaide and Perth). State Rail provided interstate rail freight services in conjunction with other rail systems up until the early 1990s. Interstate rail freight services have subsequently been provided by the National Rail Corporation and, more recently, other operators.

A changing market environment

For most of the period covered in this case study, the NSW government operator of rail freight services enjoyed a monopoly in the intrastate rail market as did other State operators in their respective markets. That is no longer the case. In response to the implementation of the national competition policy agreement the NSW rail network was opened up to competition from third party operators on July 1996. In addition, the boundaries of competition from other modes of transport are changing, for example, competition with road transport in the intermodal freight market.

The emergence of new rail freight operators has taken time but there are signs that the NSW rail freight market is becoming more competitive. For example, the Australian Traction Corporation (Austrac) — based at Junee — commenced freight operations in October 1997. Austrac's operations were initially geared to transporting agricultural exports to Sydney but have since been diversified to include freight services to Melbourne and Port Kembla and a container shuttle service around the Sydney waterfront (Elias 1999). Freight hauled by Austrac typically includes wine, stockfeed, frozen meat, minerals, grains and timber (Rail Projects Taskforce 1999, p. 64).

The National Rail Corporation recently won a contract with NSW power utility Macquarie Generation to carry coal to the Bayswater and Liddell power stations (Davis 1998). This is the first time FreightCorp has faced competition from another rail operator in hauling coal in the Hunter Valley.

The privatisation of other States' rail freight operations is expected to create new competitive pressures on FreightCorp. Private operators are likely to feel less constrained in seeking out opportunities in the NSW rail freight market.

While competition is providing FreightCorp with a challenge in its traditional markets it is also opening up new opportunities through moves to create a national

rail market. FreightCorp has responded by developing a national strategy for expanding its business beyond NSW. In 1998 FreightCorp entered the interstate rail market with freight services between Sydney and Melbourne; and Sydney and Brisbane. FreightCorp has also secured a contract to haul coal for the South Australian electricity utility Flinders Power from the Leigh Creek coal field to the utility's power stations at PortAugusta. Other opportunities outside NSW are currently being considered.

4.2 NSW rail freight prior to microeconomic reform

The condition of State Rail

In the late 1980s the condition and performance of StateRail was analysed in three major reports (box4.1). These reports provide a comprehensive assessment of State Rail just prior to commencement of substantial reforms.

The picture of StateRail that emerges from these reports is an organisation with very serious operational and structural problems. As StateRail noted in its 1988-89 Annual Report 'nearly every aspect of StateRail needs to be fixed' (p.7).

Not surprisingly StateRail's productivity was judged to be relatively low. The Booz.Allen & Hamilton report found that in 1987-88 the labour productivity of State Rail's freight operations was less than 20per cent of the norm for north American railways notwithstanding the fact that StateRail enjoyed a higher proportion of 'rail favourable' bulk traffic (Booz.Allen & Hamilton 1989, p. 22).

The factors identified in the reports as contributing to StateRail's poor performance include:

- State Rail's poor financial position;
- political intervention;
- management failure;
- inefficient and out-moded work practices;
- an organisational structure that was not focused on achieving business objectives;
- an organisational culture that did not demand high levels of productivity;
- worn-out, poorly designed rail infrastructure; and
- inefficient fleet management.

Box 4.1 **Reports covering the condition of State Rail in the late 1980s**

In the late 1980s the condition and performance of State Rail was analysed in three major reports.

- The NSW Commission of Audit (1988) *Focus on Reform — Report on the State's Finances* (the Curran Report). This report was commissioned by the Coalition Government after taking office in 1988. The Commission of Audit was charged with reviewing the State's balance sheet and financial commitments.
- PA Consulting Services (1988) *State Rail — Future Directions*. This report was also commissioned by the Coalition Government in 1988. The report aimed to: obtain a broad independent view of State Rail on which to base strategic decisions; develop and examine options for the future; and initiate a dialogue between the Government and State Rail about the broad directions for change.
- Booz.Allen & Hamilton (1989) *Diagnostic Review and Strategic Priorities for Freight and Country Passenger*. This report was commissioned by State Rail to assist it develop a strategic repositioning plan. Booz.Allen & Hamilton was engaged to: conduct a comprehensive diagnostic review of State Rail against leading overseas railways; recommend a strategic repositioning strategy; and assist management in planning the transition from the traditional government-owned organisation towards a commercial business.

These problems related not just to State Rail's freight operations but to the organisation as a whole. Therefore much of the discussion in this section covers State Rail's overall operations. However where possible the discussion attempts to illustrate the problems using examples from State Rail's freight operations.

Financial problems

By the late 1980s State Rail had serious financial problems which restricted management's ability to finance productivity enhancing reforms such as labour redundancy payments, retraining and capital improvements. State Rail depended on large annual government operating subsidies and borrowings to finance the replacement of worn-out assets and new investment.

PA Consulting estimated that in 1987-88 State Rail required a total government contribution of \$1.2 billion on a fully accrued basis. This figure comprised an operating loss of around \$1 billion plus government funded concessions of \$230 million. State Rail's inability to cover operating costs reflected operational inefficiencies; low levels of productivity; and the provision of government specified services and fares that could not be supplied on a commercial basis.

In terms of StateRail's freight operations PA Consulting estimated that these services required a total government contribution of \$372million in 1987-88. This covered an operating loss of \$243million plus government concessions of \$129 million. Loss making freight businesses were small freight, general, and intermodal. Only the transportation of export coal, minerals and grain were potential commercial activities.

By the late 1980s State Rail had become locked into a debt building cycle of critical proportions. PA Consulting estimated that in 1987-88 State Rail's total liabilities exceeded \$6billion. Of this amount, \$4.3billion related to borrowings for asset acquisitions. Debt was increasing each year as a result of loans used for capital works. Several factors were contributing to the buildup in debt.

- Past governments had required State Rail to borrow money to fund capital works to provide services that were not a commercial proposition.
- Poor management practices — for example project evaluation — had contributed to a misapplication of capital.
- As State Rail was not covering operating costs there were no surplus funds to reduce debt. (At the time the proceeds from the sale of property and other assets only supplemented the capital works program.)
- State Rail faced continuing pressure to borrow in order to: replace wornout assets; keep pace with changing technology; and meet increasing demand.

Without remedial action StateRail's debt would have continued to escalate. In 1988 PA Consulting estimated that StateRail would require \$16.5billion of additional borrowings by 2002 (Booz.Allen & Hamilton1989, p. 4).

State Rail did not bear the debt charges associated with its borrowings — being reimbursed from the NSW Consolidated Fund for interest payments and any other expenses associated with its debt. This was one factor that tended to distort decision making in favour of relying on new investment to reduce operating costs (NSW Commission of Audit1988, Appendix A.2, p. 3). Furthermore as a result of the build-up of State Rail debt the NSW Government faced a growing debt servicing burden that had to be met from general government revenue.

Booz.Allen & Hamilton's review of StateRail's performance concluded that 'by any normal business standards, absent its support from the State, it [StateRail] would be considered bankrupt' (Booz.Allen & Hamilton1989, p. 10).

Political intervention

The NSW Commission of Audit argued that political intervention in the day-to-day operation of StateRail had been detrimental to management responsibility and accountability (NSW Commission of Audit 1988, Appendix A.2, p. 5). Frequent government intervention had increased costs and impeded moves to improve efficiency and rationalise services.

Political intervention had serious implications for the management of StateRail. Governments had set conflicting commercial, social and regulatory objectives which left management without a clear corporate mission. Booz.Allen & Hamilton noted that 'Without a clear mission, it is not possible to have a successful strategy, integrated business plans and effective management' (Booz.Allen & Hamilton 1989, p. 10). This worked to undermine the responsibility and accountability of management for the performance of the railway.

The NSW Commission of Audit (1988, Appendix A.2, p. 5) cited the following examples of political intervention which had an adverse impact on the operation of State Rail:

- deferral of tough decisions, or failure even to make decisions on such matters as open barriers and the elimination of country trains on uneconomic routes;
- prevention of transfer of redundant staff;
- use of freight rates as a vehicle for industry subsidy;
- lack of support for rationalisation of uneconomic services;
- directions to carry freight for customers despite their failure to pay outstanding amounts owed; and
- increasing employee entitlements without reference to StateRail's ability to pay.

Political intervention also contributed to the misapplication of capital by working against the development of sound longterm investment strategies. As the Industry Commission noted in its report on rail transport:

Strategies must be applied consistently for a number of years because railway investment is lumpy, involving longterm planning and construction leadtimes. It follows then that there is no place for day-to-day and ad hoc government intervention if railways are to be managed efficiently (IC 1991, p. 51).

Booz.Allen & Hamilton concluded that in the case of StateRail '... investments ... have tended to be on an adhoc, political basis, rather than implementing longer term objectives' (Booz.Allen & Hamilton 1989, p. 10).

Management failure

The efficiency and productivity of an organisation is heavily dependent on the quality and effectiveness of its management. In the 1980s State Rail did not have in place the critical management processes necessary to achieve high levels of efficiency and productivity (Booz.Allen & Hamilton 1989, p.27). State Rail's management was constrained by: the organisation's poor financial position; political intervention; a functional organisational structure; and extremely poor management information systems. Management failure contributed to poor information flow within the organisation, an inability to price services on a rational basis and the misapplication of capital.

Prior to reform State Rail's management structure was unwieldy and not conducive to implementing change. Booz.Allen & Hamilton (1989, p. 11) described the management structure in the following terms:

... the management process at State Rail was typical of a Government Department — not a business. There were two 'railways' — one at Transport House which had endless meetings and produced studies and reports for government — the other was the field organisation which ran trains and maintained plant and equipment With 'as many as 17 layers in the organisation' it is not surprising that information did not flow between Transport House and the field. The management committee structure ... provided senior managers with nearly full time jobs attending meetings — little time for actual management.

The effective management of State Rail was hampered by extremely poor management information systems. The NSW Commission of Audit (1988) noted that while State Rail collected a large amount of data on performance 'little is converted into senior management information, such as strategic measures of costs, profitability and asset utilisation' (NSW Commission of Audit 1988, Appendix A.2, p. 9). Booz.Allen & Hamilton (1989, p. 12) found State Rail's management information to be:

... in the worst condition of any railway we have studied in the last 20 years. Basic traffic flow records are incomplete, inaccurate, unusable for analysis without major corrective effort. Reported statistics are improperly calculated, distorting performance. Payroll records and personnel records are incompatible and conflicting. Meaningful production statistics are virtually non-existent. The chart of accounts contains 35 000 accounts — enough to assign one to each employee.

The poor condition of State Rail's management information systems made it difficult to set prices on a rational basis. The NSW Commission of Audit (1988, Appendix A.2, p. 3) noted that:

In the absence of adequate information on the costs of services, prices for freight or passenger services cannot be set on a rational basis. Further, the full extent of implicit subsidies for individual traffics cannot be determined.

Management failure also contributed to the misapplication of capital through poor project evaluation. The NSW Commission of Audit (1988, Appendix A.2, p. 12-13) noted that:

A structured approach has not been used for determining priorities and justifying capital works. Typically, submissions on projects have been 'bids' for funds with little accompanying detailed justification or priority ranking. ...

... There does not appear to be any formal procedure used for initiating new projects or controlling their development at the concept phase. Lack of controls at the concept stage can result in expenditure of significant resources on projects unlikely to be implemented.

The interaction of poor project evaluation and the fact that State Rail did not bear the full costs of its borrowings resulted in an excessive reliance on new investment to reduce operating costs. As the NSW Commission of Audit (1988, Appendix A.2, p. 3) noted:

In these circumstances, asset replacement becomes an easy 'solution' to poor maintenance and work practices although such replacements may not be the most cost effective when capital costs are taken into account.

Work practices

In the 1980s State Rail was chronically overstaffed and its work practices were inefficient (State Rail Annual Report 1988/89). This contributed to low levels of productivity and excessive operating overheads.

PA Consulting reporting in 1988 noted that:

Although staff numbers have been reduced in the last three years, State Rail still has excessive labour costs: its systems are labour intensive; overhead is excessive; new technology is underutilised; staff surpluses exist in some areas, and shortages in others; some staff are engaged in unnecessary work; many work practices are restrictive; and some staff are employed on poorly patronised services (PA Consulting 1988).

The Booz.Allen and Hamilton report noted that engineman/guard productivity in rail freight operations was low due to a combination of issues involving excess staffing, restrictive work and rostering practices, dispersed depots, and operating inefficiencies (Booz.Allen & Hamilton 1989, p. 41). For example freight service engineman actual hours handling trains between terminals were about 30 per cent of total hours paid, approximately onehalf of best American practice.

Organisational structure

For much of the 1980s State Rail had a traditional branchbased functional structure. As noted in the IndustryCommission's 1991 rail transport report one disadvantage of this structure was that it lacked a clear business focus.

Railways have traditionally organised along functional lines, for example, operations, signalling and communications. The major disadvantage of this type of structure is that the focus of management is shifted away from markets and customers to 'running trains or engineering excellence focus' (Queensland Government Submission quoted in IC 1991, p. 155).

The NSW Commission of Audit (1988, Appendix A.2, p. 5) argued:

It is vital that the State Rail Authority move from an excessive emphasis on functional structures and create management units, defined by business sector, with clear business goals.

Organisational culture

During most of the 1980s StateRail did not have an organisational culture that demanded high levels of productivity. This reflected the absence of: commercial incentives; a clear, well understood, achievable mission; and adequate management information systems and controls. One indicator of the lack of a 'success culture' in State Rail was the high rates of staff absenteeism and light duties recorded at the time (NSW Commission of Audit1988, Appendix A.2, p. 2).

Rail infrastructure

State Rail's performance in the 1980s was hampered by wornout and poorly designed infrastructure (box4.2). On the face of it this may appear surprising given State Rail had borrowed heavily throughout the early 1980s to fund capital expenditure. However it is likely that StateRail's financial problems constrained much-needed maintenance expenditure; and political intervention and management failure had contributed to a misapplication of capital.

Box 4.2 Deficiencies in NSW rail freight infrastructure

In 1989 Booz.Allen & Hamilton identified the following deficiencies in StateRail's rail freight infrastructure.

- The basic design of StateRail's plant did not promote an efficient operation. Passing loops, signalling and yards were designed for short trains. While train sizes could be increased within the existing plant constraints, significant improvement to North American standards would have required major expenditure.
- Freight yard facilities in Sydney were inadequate. Freight services utilised five separate yard facilities in Sydney to support a total marshalling requirement of under 1,000 wagons per day, a volume within the capabilities of a single modern flat switching facility. This dispersion of activity resulted in otherwise unnecessary transfer runs between yard facilities. It also resulted in multiple handling of wagons — increasing expense and wagon requirements. More generally the dispersion of activity greatly increased the complexity of train operations.
- Intermodal terminals were poorly designed and of limited capacity. Within the Sydney metropolitan area, State Rail served a multitude of container handling facilities. This dispersion of activity raised costs and reduced service levels. Facilities lacked the container storage area, load/unload equipment, or track space to minimise handling times and provide timely availability of loads to customers.
- Lack of effective radio communications increased dispatch costs, signal costs, and reduced operating flexibility. StateRail had only one radio channel system wide and geographic coverage was far from complete. At the time a typical US railway would have had a minimum of four dedicated channels, with specific channels dedicated to mainline dispatch, marshalling activities, ways and works, and management control.
- State Rail's wagon fleet was old and presented a significant impediment to efficient rail operations. Of the wagons in revenue service one third were over 20years old. Over forty per cent of the wagons were not covered by scheduled maintenance programs, but were maintained only as required.
- State Rail's diesel locomotive fleet was extremely old and major overhaul programs had been deferred. Average age of the mainline diesel fleet was 23years compared to 13 years (and decreasing) in the US. Major overhaul work was overdue on around 70per cent of the fleet — resulting from continuing deferral of programs in the expectation of replacement of many of these units. As a result, diesel locomotive maintenance costs were excessively high, availability and reliability were low, and operating flexibility was restricted.
- Basic track components were generally in good condition but track surface and alignment and bridges required immediate attention.

Source: Booz.Allen & Hamilton (1989) Diagnostic Review and Strategic Priorities for Freight and Country Passenger

Fleet management

Inefficient fleet management practices were contributing to StateRail's low levels of productivity by increasing the number of locomotives and wagons needed to meet operational requirements. For example, Booz.Allen & Hamilton estimated there was scope to reduce StateRail's wagon fleet by over 20per cent by improving operating, marshalling, car management and maintenance practices (Booz.Allen & Hamilton 1989, p. 50).

The Booz.Allen & Hamilton report suggested there was considerable scope to improve fleet management practices (box4.3).

Measures taken to improve performance

The extent of the problems facing StateRail in the late 1980s were well known to management. However management had on the whole been unable to implement significant change. The Booz.Allen & Hamilton (1989,p. 15) report noted that:

Few aspects of StateRail have not been studied by consultants — often with several studies by several consultants. There is far less evidence of resulting action to carry out study recommendations or any resulting fundamental changes in StateRail.

Nevertheless StateRail had taken some measures to improve the efficiency and productivity of its operations.

From 1986-87 State Rail began to tackle the problem of chronic overstaffing. The total number of staff employed by StateRail had been relatively stable in the early 1980s — declining by only 3per cent between 30June 1981 and 30 June 1986. However in the two years to 30June 1988 State Rail shed around 12per cent of its workforce. Over the same period the number of staff employed in rail freight operations declined by around 10per cent.

Some examples of measures StateRail took to improve the efficiency and productivity of its rail freight services included:

- the introduction of dedicated trains carrying a single commodity;
- increasing the size of most general freight trains from 1000 to 2000 tonnes;
- the introduction of 63 wagon coal trains and trialing of 84 wagon coal trains;
- the introduction of a 'superfreighter' interstate service operating at passenger train speeds between capital cities;
- centralised Traffic Control on major corridors;

Box 4.3 The potential to improve fleet management

The Booz.Allen & Hamilton report identified the following areas where State Rail could improve the fleet management of its rail freight operations:

- consolidation of single commodity trains into larger groupmarshalled trains — eliminating ‘taxi service at bus rates’;
- the adjustment of schedules on lighter density routes to minimise or eliminate opposing movements;
- the selective operation of overlength trains;
- improved utilisation of the newer portions of the wagon fleet;
- improved compliance with marshalling procedures and car management programs;
- the elimination of delays occurring due to the unnecessary yard handling of wagons;
- the seven day operation of mineral and grain fleets;
- the possibility of transferring modern diesel locomotives from StatRail’s country passenger business to freight services; and
- enhancing wagon distribution processes to improve utilisation.

Source: Booz.Allen & Hamilton (1989) Diagnostic Review and Strategic Priorities for Freight and Country Passenger

- the introduction of a computer based Rolling Stock Management and Monitoring system; and
- the introduction of new palletsized containers to save time loading and unloading containers.

The 1987-88 State Rail Annual Report noted that a number of important initiatives had commenced to improve the operation of freight services.

- Freight services was preparing a five year strategic plan as a blueprint for future business and operations.
- Work had begun on the installation of an inhouse rail freight cost model to provide costings for more than 400 business flows and to assist in planning and scenario testing.
- A computerised freight operations information system was to be introduced to improve resource utilisation and productivity.

-
- A review of freight terminals was underway to develop a rationalisation and development plan.

While the changes initiated by StateRail in the mid-1980s had the potential to improve efficiency and productivity at the margin they were unlikely to have been sufficient to turn the organisation around. Problems relating to conflicting government objectives; an unwieldy and poorly focused organisational structure; an escalating debt burden; inefficient and inflexible work practices; and worn-out infrastructure had not been resolved.

This view is supported by the report prepared by PA Consulting for the NSW Government in 1988. The report included some projections to determine the implications of 'business as usual' (ie. a no reform scenario). The projections confirm that efforts underway in the mid-1980s to improve StateRail's performance would not have been sufficient to achieve a significant turnaround in performance.

- PA Consulting estimated that StateRail's freight operations would continue to lose \$370 million per annum despite achieving some cost reductions. This was because new borrowings would have been required to cover losses in unprofitable freight services (PA Consulting 1988).

However, of all StateRail's operations rail freight was the best placed to make the transition to a commercially oriented business activity. This simply reflected that rail enjoys a comparative advantage in hauling bulk commodities and NSW rail freight enjoys a high proportion of such 'rail favourable' traffic. The transporting of bulk commodities for export (coal and grain) had been identified by the consultants' reports as commercially viable. Intermodal, small, and general freight operations were more problematic.

4.3 Microeconomic reforms and other sources of change

Changes in a wide range of factors can influence the performance of an organisation, including: — conditions prevailing in input and output markets; public policy; technology; the exchange rate; and social preferences (for example, society placing a higher value on the environment). In the case of NSW rail freight operations there were a number of potential sources of change:

- microeconomic reforms;
- demand pressure;
- exogenous technological change; and

-
- competition from road transport.

Microeconomic reforms

Microeconomic reform may be defined as changes in government policy and institutional arrangements which affect the behaviour of particular firms, industries, individuals and households. The ultimate aim of microeconomic reform is to improve living standards. The focus of this paper is on those changes in government policy that have affected the behaviour of the NSW government owned rail freight operator.

In practice there are no hard and fast rules as to what constitutes a microeconomic reform. It depends in large part on the context of the policy change being considered. A policy change may or may not be a reform depending on whether it is designed to achieve 'reform' outcomes or is part of a package of measures designed to achieve 'reform' outcomes. For example, a government decision to invest more money in rail infrastructure would not necessarily constitute a microeconomic reform. However, when such an increase in investment is intended to change the behaviour of a rail operator — for example by facilitating the transition to a commercially viable business — it is reasonable to see the initiative as a microeconomic reform.

Several factors have encouraged reforms in the NSW rail industry. As already mentioned, StateRail's poor financial position in the late 1980s provided a strong incentive for the NSW government to undertake reform. By the late 1980s State Rail as a whole accounted for a significant share of NSW's borrowing and required government funding of around \$3million a day (Booz.Allen & Hamilton 1989, p. 4). Financial projections at the time showed there was little prospect of turning State Rail's finances around in the absence of reform. Historically government financing of loss making public authorities had generally been accepted — especially during periods of high economic growth and prosperity. But, by the late 1980s, the NSW government was under pressure to put its finances on a more sustainable footing (NSW Commission of Audit 1988, p. vi).

A range of other factors also encouraged reforms in the NSW rail industry. A change of government in NSW in 1988 — and the two major inquiries it commissioned (the NSW Commission of Audit report and PA Consulting Group's report on State Rail) — were important precursors to reform. Pressure from rail freight users (for example the export coal industry) to improve the performance and pricing of NSW rail freight services has encouraged reform. Over the last decade there has also been greater scrutiny of the performance and pricing policies of the

rail industry (for example the: Royal Commission into Grain Storage, Handling and Transport; Industry Commission's 1991 rail report; Bureau of Industry Economics international benchmarking work on the rail freight industry; and work of the Steering Committee on National Performance Monitoring of Government Trading Enterprises). More recently the National Competition Principles Agreement has been the catalyst for significant changes to the structure of government owned rail operators and the conduct of rail markets in Australia.

Over the last decade NSW rail freight has been subject to substantial microeconomic reforms. FigureE.2 provides a time-line of key microeconomic reforms that have directly affected NSW rail freight operations over the period 1980 to 1997.

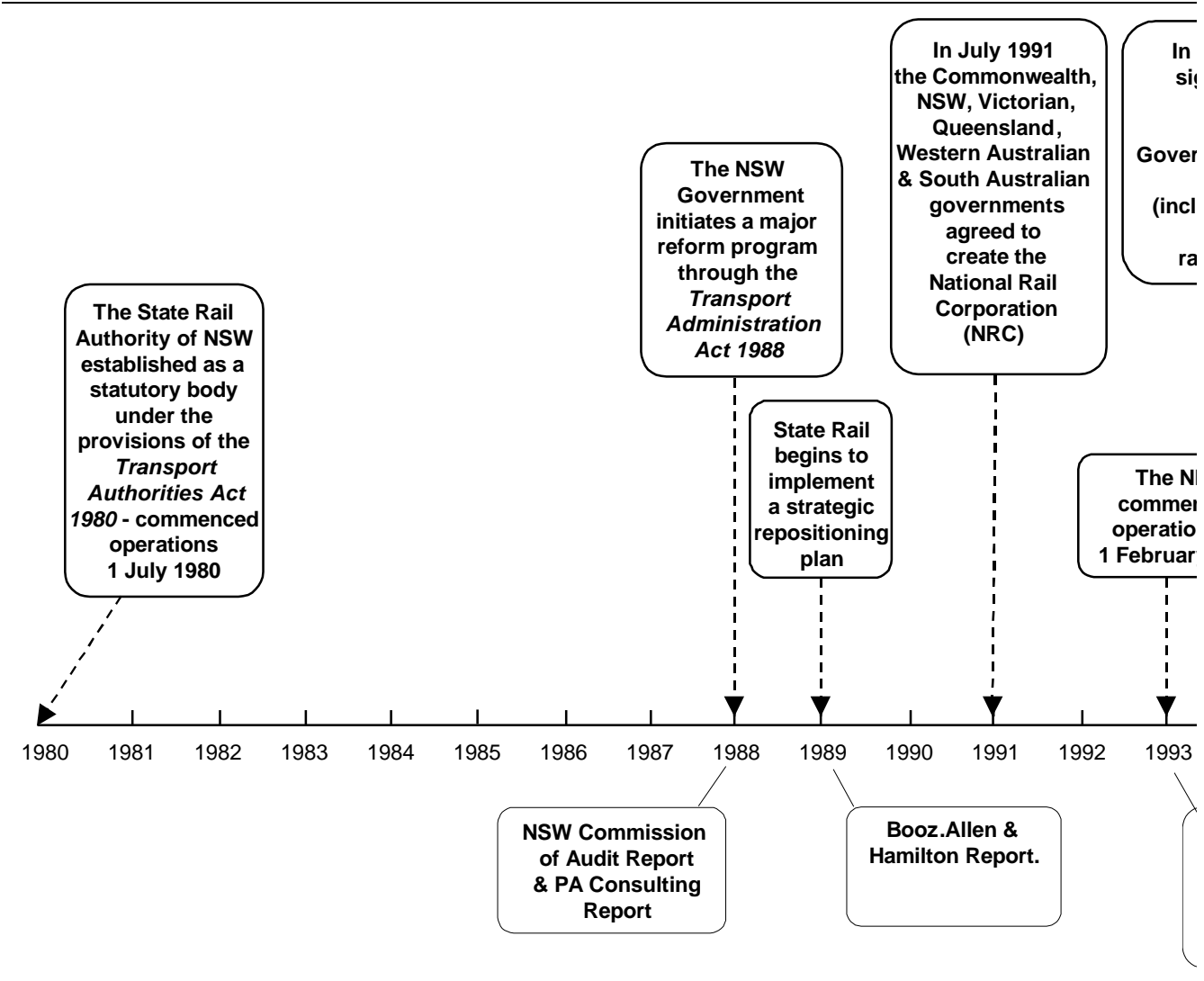
The broad direction of reform has been to commercialise NSW rail freight operations and more recently to open the rail freight network up to competition. The key microeconomic reforms directly affecting NSW rail freight operations have been:

- commercialisation;
- the creation of the National Rail Corporation;
- competition policy;
- the vertical separation and corporatisation of rail freight operations; and
- the opening up of the NSW rail network to competition from third party rail operators.

These reforms have resulted in a significant shift in the operating environment and organisational culture of NSW rail freight.

This paper deals only with the history of reforms as introduced. There is no attempt to assess whether adequate or all possible steps have been taken to address the problems outlined in section4.2.

Figure 4.1 Key microeconomic reforms affecting NSW rail freight operations



Commercialisation

In 1988 the NSW Government initiated a major reform program to address State Rail's financial problems and ensure the government earned an appropriate return on its investment in the railway. The Government's approach to reform was to require State Rail to operate as a commercial organisation. The commercialisation of NSW rail operations involved:

- legislative changes to instil a commercial focus;
- a capital investment program;
- a financial restructuring package; and
- the formalisation of the provision of uneconomic services through a community service obligation contract.

Commercialisation is intended to put the operations of government business enterprises (GBEs) at 'arms length' from government — in order to enable the GBE to operate more efficiently. Commercialisation generally involves four key elements:

- setting clear objectives and establishing procedures for resolving any conflicts between commercial, social and regulatory objectives;
- establishing managerial autonomy, authority and responsibility;
- establishing effective performance monitoring by the ownegovernment; and
- setting effective rewards and sanctions related to performance.

In the case of StateRail the instrument used to bring about these changes was the *Transport Administration Act 1988* which came into effect on 16 January 1989. This Act replaced the *Transport Authorities' Act 1980* under which StateRail had been established. The new Act was intended to achieve a significant shift in the focus and organisational culture of StateRail (box 4.4).

To emphasise its commitment to StateRail's new commercial focus the Government appointed a new Board of Directors, Chairman and Chief Executive. The Government also announced a major fiveyear investment program to redress the poor state of StateRail's infrastructure. This included a \$600million investment program to rehabilitate the infrastructure of the Freight and Countrylink business units.

To assist State Rail make the transition to a commercially orientated organisation the NSW Government and StateRail negotiated a financial restructuring package.

As previously noted StateRail was carrying a huge debt burden. The financial restructuring package recognised that management could not be expected to turnaround State Rail while it had this handicap. It was likely that ‘below the line’ non-operating and financial charges would overshadow any achievements in eliminating operating revenue losses (Booz.Allen & Hamilton 1989, p. 96). The Government therefore accepted the need for StateRail to be recapitalised. The financial restructuring package included the following elements.

- The government agreed to fund the elimination of historic operating inefficiencies on the basis that this liability would be finite. StateRail committed itself to eliminating operating inefficiencies over five years. For the Freight business unit the goal was to eliminate operating losses over three years.
- The bulk of State Rail’s outstanding debt as at 30 June 1989 was transferred to the State government which in return was to receive the net cash proceeds from the sale of surplus property.

Box 4.4 *The Transport Administration Act 1988*

The *Transport Administration Act 1988* included some significant reforms to NSW railway administrative arrangements.

- The Act required StateRail to operate in accordance with sound commercial practice with an independent commercially-oriented Board.
- The Act delineated the roles of the NSW Minister of Transport and State Rail. The Minister became responsible for transport policy, while the StateRail Board controlled the Authority’s financial operations and was responsible for formulating business strategies. The Minister was required to issue instructions in writing before the chief executive was obliged to execute the order, although managers were still free to execute ministerial suggestions. The Board was able to request a review of any instruction that it regarded detrimental to the commercial and financial interests of the Authority. The Minister was then required to estimate the financial loss, consult with the NSW Treasurer and only confirm the decision if the Treasurer had approved reimbursement of the financial loss from the public purse.
- The Act gave StateRail the freedom to act comparably to private sector commercial organisations. For example, State Rail no longer had a common carrier obligation.
- The Act strengthened the responsibility and accountability of management by requiring State Rail to prepare annual corporate plans. The corporate plan was to contain strategies to achieve key objectives and to report on progress made in achieving these objectives.

The funding requirements (operational and capital) of State Rail's CityRail and Countrylink operations were to be made available as a grant in recognition of the non-commercial nature of these businesses. Commercial freight operations were to be responsible for servicing all its future capital investments.

The NSW Government and StateRail also negotiated a Community Service Obligation (CSO) contract which came into effect from July 1991. The CSO contract established some discipline and transparency in the government requiring State Rail to provide non-commercial services.

The CSO contract defined the level of service required by the government. State Rail was reimbursed for the difference between the cost of providing the service and revenue earned. The contract was monitored and included performance-based rewards and sanctions.

Today CSO payments made to FreightCorp still support the haulage of some grain, minerals and general freight across regional NSW — services that would not otherwise be a commercial proposition. The payment of CSOs generally reflects broader social and economic objectives. For example, many wheat farmers have their product delivered to port at a reduced rate, with a view to saving country roads, supporting small communities and contributing to Australia's export effort.

In addition explicit CSO payments are made to the Rail Access Corporation (RAC) for track infrastructure on a number of regional branchlines.

National Rail Corporation

In July 1991 the Commonwealth, NSW, Victorian, Queensland, Western Australian and South Australian governments agreed to create the National Rail Corporation (NRC). The NRC was established to take over responsibility for interstate rail operations throughout Australia. The aim was to eliminate the financial losses historically associated with interstate rail freight services and develop a viable business. The NRC commenced operations on February 1993 and the transfer of operations and assets from other public rail authorities was subsequently completed over a number of years.

For State Rail the creation of the NRC resulted in the transfer of some rolling stock and terminals to the new organisation. For a number of years State Rail continued to provide selected services to the NRC while the staged transfer of functions and assets took place.

Corporatisation

In August 1995 the NSW Government announced further major microeconomic reforms for its rail operations in response to the requirements of the Competition Principles Agreement (box 4.5). Under this program NSW rail operations were restructured (box 4.6). As part of the restructure FreightCorp was created as a NSW government owned statutory corporation providing ‘above rail’ freight services. FreightCorp’s corporate structure and governance is spelt out in the *State Owned Corporations Act 1989* (box 4.7).

Corporatisation aims to replicate many of the commercial incentives which apply to private firms, but without a change in ownership. Within the constraints imposed by ongoing government ownership, corporatisation seeks to establish a structure of incentives that approximates those that exist for private sector firms and, by removing factors which have both advantaged and disadvantaged public authorities compared with their private sector counterparts, to provide public enterprises with an even sharper commercial focus.

Corporatisation goes beyond commercialisation by moving the day-to-day operation and investment decisions of GBEs further away from direct government control and bringing the structure and operations of GBEs more into line with the private sector. Corporatisation usually involves some structural changes to GBEs to avoid the possibility of conflicting objectives, for example by formally separating the roles of service delivery, standard setting, regulation and policymaking. Corporatisation also usually involves measures to try and attain competitive neutrality in both a GBE’s input and output markets and provide for the effective regulation of any natural monopoly powers. However corporatisation of an organisation does not of itself guarantee competitive neutrality will be achieved. Other measures may also be required.

As a NSW state owned corporation FreightCorp is required to operate:

- efficiently;
- in a way that maximises the net worth of the State’s investment;
- in a socially responsible manner;
- in accordance with the principles of ecologically sustainable development; and
- with consideration of regional development (the *NSW State Owned Corporations Act 1989*).

Box 4.5 National competition policy

In 1995 the Commonwealth, State and Territory governments signed three agreements establishing a national agenda of competition policy reform.

- Under the Code of Conduct Agreement governments agreed to extend the competitive conduct rules of the *Trade Practices Act* to unincorporated businesses and government business enterprises.
- The Competition Principles Agreement covers the structural reform of public monopolies, legislation review, prices oversight, competitive neutrality and access rights.
- The Agreement to Implement the National Competition Policy and Related Reforms provides financial incentives for the States to progress implementation of the NCP.

The NCP framework has a number of important implications for rail freight services.

- The NCP allowed governments to delay some rail access initiatives. Notable is the case of coal, where there is an agreement that government transport of coal by rail can be excluded from competition for five years (until November 2000).
 - The NSW Government in its rail access regime has not excluded third parties wishing to carry coal (PC 1998b, p. 197). The NSW Government's policy is to use the moratorium period:
 - ... Only in respect of coal access prices and not access per se; and then
 - ... To implement a program of phased reductions in coal access prices rather than maintain prices throughout the period (NSW Government submission quoted in PC 1998b, p. 197).
- Governments are required to review legislation that restricts competition — eg. Regulations that reserve the transport of particular bulk commodities to rail.
- The NCP encourages the restructuring of rail systems to encourage competition. This involves: separating regulatory responsibilities from commercial operations; separating natural monopoly activities from potentially competitive activities; and separating potentially competitive activities into independent business units.
- The NCP includes reforms to the provision of CSOs.
- The NCP provides third parties with the opportunity to access rail track and other related infrastructure.
- Under the Competition Principles Agreement prices oversight remains the prime responsibility of the State or territory that owns the enterprise.
- The Competition Principles Agreement includes provisions to promote competitive neutrality between GBEs and private sector enterprises. The aim is to ensure that GBEs do not enjoy any net competitive advantage simply as a result of their public sector ownership. The Competition Principles Agreement calls for GBEs to adopt a corporatisation model where practical.

Source: BIE (1995) *Rail Freight 1995 International Benchmarking*, Report 95/22.

FreightCorp is subject to a tax equivalence regime whereby company tax is payable to the NSW Treasury. FreightCorp is also required to pay a dividend which represents a return to the NSW Government on its investment in rail freight operations. The amount of the dividend is agreed with the NSW Government each year in FreightCorp's Statement of Corporate Intent.

Opening the NSW rail system up to competition

In 1995 the NSW Government announced that the rail freight network would be opened up to competition from 1 July 1996.

Competition can provide a powerful incentive for service providers to meet the requirements of users and provide value in terms of quality, delivery or price. When service users are able to choose between competing providers, the seller of over priced or inferior quality services is likely to face a declining market share. In some markets even the threat of competition can be enough to encourage service providers to operate and price efficiently. Furthermore sustained pressure from competition can ensure the search for ways of improving efficiency and responding to changing market conditions is ongoing. In this way competition can be a powerful driver of improvements in dynamic efficiency.

Box 4.6 The restructuring of NSW rail operations

On 1 July 1996 State Rail was disaggregated into four new independent entities covering infrastructure, maintenance, freight and passenger services.

- The Rail Access Corporation (RAC) owns the track and related infrastructure and is responsible for negotiating access to the rail network by rail operators and funding the upkeep of the track.
- The Rail Services Authority (RSA) maintains the track under contract to the Rail Access Corporation and provides construction and some maintenance services under contract to the rail operators.
 - The RSA was subsequently corporatised on 1 July 1998 creating Rail Services Australia.
- FreightCorp operates 'above rail' freight services and is responsible for the management and control of its rolling stock and locomotives.
- A new State Rail Authority provides city and country passenger rail services throughout NSW and is responsible for train control under contract to the Rail Access Corporation.

Source: State Rail and FreightCorp annual reports.

Achieving the full benefits of competition in the NSW rail freight market has been delayed by the length of time it has taken to develop effective third party access regimes to rail infrastructure. As the Productivity Commission noted in its report into the Australian Black Coal Industry:

The introduction of access to rail infrastructure for coal freight services in NSW has been hampered by the lack of an effective access regime against which new freight carriers can confidently invest and by the protracted negotiations for declaration. This has unnecessarily slowed the achievement of the significant price and productivity benefits from competition in coal rail freight (PC998b, p. 201).

Nevertheless some operators have negotiated access to the NSW rail system. For example the NRC now provides coal freight services in the Hunter Valley.

In the general freight market FreightCorp is experiencing increased competition from small scale rail operators. There are several regionally based private rail operators providing FreightCorp with competition in the general freight market — for example Austrac in the Riverina region.

Box 4.7 FreightCorp's corporate governance

FreightCorp's relationship with the NSW Government is spelt out in the *State Owned Corporations Act 1989*. Under the Act FreightCorp was established as a proxy company with a Board of Directors, share capital and a memorandum and articles of association like a public company limited by shares. However unlike a public company the shareholders' interests are represented by the NSW Treasurer and one other Minister who cannot be the portfolio Minister.

FreightCorp's shareholding ministers — the NSW Treasurer and the Special Minister of State and Assistant Treasurer — can be equated with the representatives of a holding company board in the private sector. The shareholding ministers are ultimately responsible for:

- Financial performance targets;
- Major investment decisions;
- Performance monitoring and strategic direction; and
- Business plans and risk monitoring.

In practice these responsibilities are executed through the shareholding ministers' approval of FreightCorp's annual Statement of Corporate Intent.

There is a clear separation between the roles and responsibilities of the shareholding and portfolio ministers. The portfolio minister's key role is one of industry regulator and purchaser of services provided as community services obligation payments to meet the government's social policy objectives.

Source: Information provided by FreightCorp.

Demand pressures

In NSW pressure to improve the performance and pricing of rail freight services has also come from variations over time in the rate at which the rail freight task has been growing and from rail freight users.

Pressure from variations in the growth of the rail freight task

Over the last decade variations in the rate at which the NSW rail freight task has been growing have created pressures to improve the performance of rail operations.

In considering the impact of variations in the growth of the rail freight task it is important to recognise that rail freight systems require considerable investment in fixed assets (for example track, signalling, yards, terminals, locomotives and wagons). Once the investment is made, variations in the volume of rail freight being hauled can have a big influence on measured productivity. For example, an increase in output that can be accommodated within the existing scale of operations would increase productivity.

In the early 1980s the NSW rail freight task grew strongly. Between 1980-81 and 1985-86 it grew on average by 5.6 per cent a year (when measured in net tonne kilometres¹) and 6.1 per cent a year (when measured in actual tonnes carried²). However around the mid-1980s growth slowed and remained relatively flat for the remainder of the decade. Between 1985-86 and 1990-91 it grew on average by only 1 per cent a year (when measured in net tonne kilometres) and contracted by 0.7 per cent a year (when measured in actual tonnes carried).

Weaker growth in the second half of the 1980s put further pressure on StatRail's poor financial position. As the Booz, Allen & Hamilton report (1989, p. 32) noted:

The absence of significant volume growth in the last three years and the declining trend in real average freight charges suggest StateRail's financial situation could continue to worsen if the present cost structure is not improved.

¹ Net tonne kilometres are the number of kilometres travelled multiplied by the net weight of freight carried (not including the weight of the wagons). Net tonne kilometres is the measure of output used in calculating productivity. The net tonne kilometres data include interstate freight tonnage.

² The tonnes carried data exclude interstate freight tonnage.

Pressure from rail freight users

Over the last decade an important source of pressure to improve the performance and pricing of NSW rail freight operations has come from rail freight users — in particular the export coal industry³

In NSW export coal is transported almost exclusively by rail. Since the mid 1980s the export coal industry has been under increasing pressure to improve productivity and reduce costs (box 4.8). With rail freight charges accounting for between 15-30 per cent of the free-on-board cost of coal production it is not surprising that the coal industry has sought to focus attention on the need to improve the efficiency and pricing of rail freight services (Dunlop 1995).

The coal industry has been particularly critical of:

- the use of rail freight charges by government to extract monopoly rents;
- operating inefficiencies; and
- the slowness of opening up the rail network to competition.

In the early 1990s the efforts of the coal industry to achieve reform in the rail industry intensified. In 1992 the NSW Government invited the coal industry to put forward proposals for the private operation of coal haulage over the rail system (Dunlop 1995). In response a number of Hunter Valley coal producers initiated and funded the Hunter Valley Rail Project (HVRP). The HVRP aimed to achieve internationally competitive charging for coal haulage by eliminating monopoly rents made from the coal traffic and by improving the efficiency of rail operations. The consortium proposed to purchase and/or lease the infrastructure and the coal haulage rolling stock from State Rail and control the operation of the system. State Rail and the NRC would have access to the system to continue handling other rail traffic (including grain and general freight traffic) (BIEI 1995, p. 19).

While the NSW Government did not adopt the proposals put forward by the HVRP, it is an example of the pressure being brought to bear on government in the early 1990s to open the rail network up to competition.

³ Export coal accounts for almost all the coal transported by rail in NSW. While rail is used to transport some coal for domestic purposes the bulk of NSW domestic coal is carried by road or conveyor due primarily to the short distances involved.

Box 4.8 Pressures in the export coal market

Since the mid-1980s Australian coal exporters have faced increasing price pressure.

In the early 1980s, when Australia expanded thermal coal exports, coal was competing in an energy market against oil, and oil prices were at historically high levels. Between 1980 and 1986, oil prices were 23 times higher than thermal coal and provided a comfortable margin within which coal producers could set prices. However in 1986 oil prices fell substantially. This collapse in oil prices led to a sharp reduction in coal prices, ushering in a new era of competition in the international coal market.

Since 1990, both Indonesia and China have increased coal exports rapidly and now supply more than one third of thermal coal imported by Asian countries. Both of these suppliers are low-cost producers and are close to Australia's traditional coal export markets. In addition, the United States has recently enhanced its capability as a coal exporter to Asia.

Technological change in steel production has reduced the amount of coking coal needed to produce a given quantity of steel and has increased the scope for substitutability between different types of coal as inputs to the steel making process. These changes have reduced the premium which Australian producers can command for high quality coking coal.

The emergence of new suppliers to the world coal market and increasing competition in the electricity and steel markets have had an important influence on the basis on which coal is traded. Buyers are purchasing a greater share of their requirements by tender or on the spot market where price competition is more intense. Less coal is being sold under long-term contracts where prices may include a premium for reliability of supply.

Source: PC (1998b), The Australian Black Coal Industry, Inquiry Report, Volume 1.

Exogenous technological change

Technological change is often identified as one of the key drivers of productivity improvement. While the basic technology underpinning rail freight operations does not appear to have changed substantially during the 1980s and 1990s, some technological changes occurred which had an impact on the efficiency of rail freight operations:

- the development of more powerful locomotives and higher capacity wagons created opportunities to improve the productivity of rail freight operations;
- increased axle loads;
- the replacement of wooden sleepers with concrete sleepers; and

-
- advances in computer and communications technology created opportunities to improve planning, scenario testing, and fleet management.

An example of the impact of new technology is the decision by FreightCorp to install a new electronic communications system IBIS (Matthews 1999). IBIS will be the main platform for electronic commerce for containerised business between FreightCorp and its customers and trading partners. IBIS will be housed on the internet, and will allow multiple users to access a common pool of information. IBIS is expected to make processes at the ports more efficient.

Competition from road

Since the early 1970s changes in transport modal shares of the Australia-wide domestic freight task reveal a substantial increase in the modal share of road, a lesser gain by rail and a sizeable reduction in the share of coastal shipping. In 1995-96 rail, road and coastal shipping each accounted for around one third of Australia's domestic freight (PC 1999, p. 11). Railways have maintained their share of the domestic freight largely through growth in Australia's mineral sector — in particular a growing coal haulage task.

The importance of competition from road transport as a source of pressure to improve the performance of NSW rail freight operations has varied considerably across market segments.

For most of the period covered in this case study State Rail and later FreightCorp, do not appear to have faced significant competition from road transport in their main business activity — hauling bulk commodities. This largely reflects the competitive advantage railways have in transporting bulk commodities over relatively long distances. In the coal market it also reflects the role of government regulation in restricting competition with road transport. The IC noted in its 1991 rail report that under the NSW Environmental Protection Act coal was usually required to be transported by rail, if available. While there is no longer a statutory requirement for coal to be transported by rail in NSW, some local government planning requirements indicate a preference for coal to be hauled by rail. In the NSW grain market there were no regulations restricting the transportation of grain by road. However, the pricing policies State Rail had in place in the late 1980s discouraged the use of road transport — that may have been available at a lower resource cost — by cross-subsidising the users of some high cost branchlines (Royal Commission into Grain Storage, Handling and Transport 1988, p. 37). Furthermore,

⁴ Information provided by FreightCorp.

competition from road transport was constrained for many years by limited road receival facilities at export ports.

Competition between rail and road transport appears to have been strongest in the general (non-bulk) freight market. Rail has been losing market share to road in the general freight market over a long period — not only over relatively short distances but also for interstate movements. One indicator of this trend is provided by the interstate container market where the volume of Australian road freight has been increasing at about three times the growth in volume of rail freight (Rail Projects Taskforce 1999, p. 58). In part road transport has been able to capture a larger share of the general freight market because of technological improvements in large articulated vehicles and the building of high quality roads.

The loss of market share to road in the general freight market is also linked to the competitive neutrality between rail and road transport. Competitive neutrality issues concern government policies and processes applying to different transport modes where they favour one mode over others. The key government-instituted arrangements which could affect competitive neutrality between rail and road transport include infrastructure investment, taxes and charges as well as access regimes, safety regulations and operating standards. The issue of competitive neutrality is beyond the scope of this paper and readers are referred to the Productivity Commission's rail report *Progress in Rail Reform* for an analysis of this issue. It is simply noted here that competitive neutrality issues may have contributed to some of the long-term decline in rail's share of the general freight market.

Competition from road transport in the general freight market would have exerted pressure on the managers of NSW rail freight operations to improve performance, particularly from the late 1980s. While general freight was low volume (accounting for only around 17 per cent of tonnage hauled in 1989/90) it was high value (accounting for around 40 per cent of State Rail freight revenue in 1989/90) (IC 1991). Given the extent of State Rail's financial problems in the late 1980s a declining share of the general freight market — through competition with road transport — would have created pressure for change.

4.4 Response of NSW government rail freight operators

The previous section outlined some of the pressures on NSW rail freight since the late 1980s to improve efficiency and productivity. This section outlines how State Rail — and later FreightCorp — responded to these pressures.

A key feature of the response of StateRail and FreightCorp was that management pursued change across a very broad front. This is not surprising given the Booz.Allen & Hamilton report had found that wide ranging changes were required to turn State Rail around.

However, this paper does not attempt to assess the extent to which the measures taken by management addressed the problems outlined in the Booz.Allen & Hamilton report. Nor does it attempt to assess the nature or extent of further measures that may be possible in the future. Rather, the intention is simply to outline the key mechanisms that have been relied on to date to improve the performance of NSW rail freight operations.

While it is difficult to generalise about the sequencing of measures taken to improve the performance of NSW rail freight, a very broad pattern is discernible.

- The initial focus of management appears to have been heavily weighted towards: developing a strategic plan to provide a framework for transforming StateRail into a commercially oriented organisation; addressing long-term structural problems (for example, organisational structure; StateRail's finances); addressing long-term operational problems (for example, management information systems); reducing overstaffing; rationalisation of some services and facilities; and investment in infrastructure renewal.
- Moving into the early 1990s there appears to have been an additional dimension to the initiatives being pursued covering: contracting out; work practices; industrial relations; and training.
- Since the creation of FreightCorp there has been an increased emphasis on positioning the business in Australia's emerging national rail market. This has been reflected in efforts to develop a stronger customer focus and strategic linkages with the private sector — while continuing to focus on reducing operating costs and increasing the flexibility of its cost structure.

Given the complexity of NSW rail freight's operating environment it is difficult to attribute decisions taken by management conclusively to specific pressures for change.

For ease of exposition NSW rail freight's response to microeconomic reforms and other pressures have been grouped under the following broad headings:

- organisation;
- management;
- work practices;
- investment in rolling stock and other rail infrastructure;

-
- rationalisation of services and facilities; and
 - pricing policies.

In most cases it is not clearcut under which of the headings individual responses should be included. For example, initiatives to manage the quality of freight services are discussed under the broad heading of organisation as they are examples of the development of an organisational culture more focused on meeting customer needs. However these initiatives could also have been discussed under the broad heading of management — as they also represent a change in management practices.

Organisation

NSW rail freight operations have increasingly focussed on achieving core business objectives and ensuring that these objectives are driven by customer needs. Key responses have included reorganising StateRail into business groups; contracting out non-core services; developing a customer focused service culture; and developing strategic linkages with other key players.

Organisational structure

Commercialisation required management to develop within StateRail a business focus. In the late 1980s a significant impediment to developing a commercial focus was State Rail's traditional functional railway structure.

In 1988 one of the first initiatives of the new StateRail Board was to reorganise State Rail into business groups. StateRail's traditional functional railway structure was replaced by three separate businesses: CityRail, Countrylink, and Freight. Because Countrylink and Freight used the same infrastructure they were initially combined into one business group. The restructuring was intended to result in smaller, more manageable units each with a specific purpose and clear understanding of its mission and objectives.

Adopting an organisational structure focused on achieving commercial objectives rather than running trains was fundamental to improving NSW rail freight's long term productivity performance.

In the mid 1990s State Rail was restructured at the corporate level in anticipation of the implementation of the National Competition Policy. This included the establishment of RailNet to manage StateRail's infrastructure assets and to facilitate access to the rail network. It also included the creation of the Rail Services Group to provide a range of maintenance and support services to the business units

and potentially private sector customers. The services provided to Freight Rail and the other business units were to be progressively opened up to competition from the private sector. This initiative was intended to drive down costs through increased competition.

In 1996 State Rail was restructured into four new independent businesses (see box 4.6). The creation of FreightCorp required the adoption of an organisational structure that reflected its primary business objective of providing 'above rail' freight services. FreightCorp's organisational structure consists of divisions focusing on business, operations, strategy and support.

Contracting out

Since the late 1980s there has been pressure on NSW rail freight to reduce operating costs and improve efficiency. Microeconomic reform opened up greater opportunities for management to explore options for reducing costs and improving productivity. This included opportunities to source some services from outside the organisation.

Early in the reform process StateRail's Board adopted a policy of testing support services in the private sector. By 1991/92 a number of non-core activities had been successfully contracted out — for example medical, legal, printing, outdoor signage and retail services. A further 40 areas were identified as being suitable for contracting out.

Competitive tendering was used for some heavy maintenance and overhaul work and to replace some rural rail freight services (small freight and parcel) with contracted road haulage.

FreightCorp considers opportunities to contract out on a case-by-case basis. Contracting out is used in those cases where it is more efficient to source a service from outside the organisation. Contracting out is currently used to provide: back-shop maintenance services; internal audit services; and selected human resource, information technology and legal services.

Service culture

Freight Rail pursued a number of initiatives which were intended to develop a customer focused service culture within the organisation. For example, FreightRail introduced a Total Quality Management scheme directed at improving on-time running of freight trains. The scheme (known as Excellence in Quality by Involving People) was implemented from 1991/92 onwards. Freight Rail staff received

training in quality principles and practices. In addition a Strategic Leadership course was implemented to review business planning and ensure strategies in annual business plans included principles expected of a quality organisation.

By the mid-1990s there was a stronger customer focus evident in FreightRail's operations. In 1994-95 Freight Rail carried out a survey of 14 of its major customers. The survey was used to identify performance gaps and lead to the development of strategies to improve customer service and satisfaction. For example a staff training workshop 'Caring for your Customer' was introduced.

With the NSW rail network opened up to competition FreightCorp has placed even more emphasis on improving customer service in order to retain customers and grow the business. In February 1997 FreightCorp commissioned an integrated Customer Service Centre at Parramatta. The Centre operates 24 hours a day, seven days a week and allowed the integration of customer liaison and planning with train management. The centre takes orders directly from customers, programs trains and assigns resources to ensure train services meet customers' individual requirements and run efficiently.

To be successful in its new competitive environment FreightCorp is attempting to differentiate its product on the basis of its service. FreightCorp aims to provide 'customised transport solutions' to its customers. This involves making the effort to understand a customer's business well enough to add value. This has meant a renewed focus on listening to customers (including annual surveys) and building successful business relationships so as to tailor price/service packages to individual customer needs.

A further example of FreightCorp's stronger customer focus is the development of more innovative contractual arrangements including the use of:

- volume incentives;
- price structures to encourage efficiencies (for example, loading rebates); and
- reciprocal performance clauses.

These contractual arrangements are intended to encourage improved efficiency in the operations of both FreightCorp and rail freight users.

FreightCorp is providing employees from all levels of management 'Success Through Service' training to support its service culture.

Underpinning many of FreightCorp's efforts to achieve a stronger customer focus has been the development of a quality program based on improving systems, people related issues and customer listening. One of the activities being completed as part

of this program is mapping all core activities to provide a basis for further and continuing reform.

Demand-side pressures have encouraged FreightCorp to work closely with key rail freight users to find ways of improving performance. In August 1996 FreightCorp, Port Waratah Coal Services (PWCS) and the NSW Minerals Council jointly funded and undertook a study to identify the main areas for efficiency gains in the Hunter Valley rail system and the means of addressing these (FreightCorp 1997, p. 17). The study resulted in a new operating agreement between FreightCorp and PWCS which involves financial incentives to encourage operational efficiencies.

In a similar vein FreightCorp has agreed with the Australian Wheat Board to jointly review the NSW grain logistics chain.

Strategic partnerships

NSW rail freight's changing operating environment has encouraged management to develop strategic partnerships with other key players in order to expand the business in key rail markets; reduce operating costs; improve efficiency; and facilitate expansion beyond NSW.

From the mid-1990s Freight Rail developed a number of strategic partnerships with the private sector to provide rail infrastructure and services.

A key element of Freight Rail's strategy of attracting new business was the development of a network of strategically located intermodal terminals throughout NSW. The aim was to win a larger share of the container market from road.

The first intermodal terminal opened at Blayney in 1994/95. The private sector operates the terminal and provides the resources to collect and distribute the containers. Freight Rail initially provided the line haul services to the terminal. Since the opening of the Blayney intermodal terminal over 100000 containers which were previously taken across the Blue Mountains by road have been carried by rail (FreightCorp 1998, p. 12).

This strategy has been continued by FreightCorp and developed into their Portlink Strategy. FreightCorp now provides total railbased logistics services, including transfer of containers by road and rail to the customer's door. FreightCorp will also store containers on site for both the domestic and international markets. FreightCorp operates regional terminals at Dubbo, Griffith, WaggaWagga, Tamworth, Kempsey, Newcastle, Moree and Narrabri. Sydney metropolitan terminals operate from Clyde and Yennora.

FreightCorp is currently developing two new intermodal terminals to service south-west Sydney and the outerwest of Sydney with terminals at Minto and St Mary's respectively (Matthews1999). The terminal at Minto is a joint development with road transport company Bowport Allroads. While at the St. Mary's terminal GrainCorp is planning to build grain silos on site.

In 1997 FreightCorp entered into an agreement with Novacoal Australia Nominees Pty Ltd (a wholly owned subsidiary of RioTinto Coal (NSW) Pty Ltd). The venture involves FreightCorp hauling new coal wagons purchased by Novacoal. It is the first private sector involvement in rail freight operations in the Hunter Valley.

The agreement between FreightCorp and GrainCorp on train crewing on selected grain branchlines is another example of an important strategic partnership (see the section on work practices).

Management

Necessary management information structures and processes have been introduced to respond to the changing operating environment. The measures outlined below are responses to pressure to manage existing resources more efficiently and to manage change. Measures have included improved: strategic planning; management practices; management information systems; and fleet management.

Strategic planning

Over the last decade NSW rail freight's changing operating environment has put pressure on management to first implement more effective strategic planning. Commercialisation created the opportunity — and put pressure on management — to improve strategic planning. Prior to commercialisation political intervention had not created an operating environment conducive to effective planning. By encouraging an arms-length relationship between the NSW Government and State Rail, the *Transport Administration Act 1988* had lessened the likelihood of ad-hoc political intervention undermining the planning and execution of change.

Commercialisation required management to transform StateRail from a traditional GBE to an organisation having a clear business focus. Given the extent of the problems confronting StateRail in the late 1980s this could only be achieved by developing a framework for implementing wide ranging changes.

That framework was provided by the Booz.Allen & Hamilton report — which formed the basis of StateRail’s first annual corporate plan in 1988/89. The plan set a new direction for StateRail and detailed a five-year strategic repositioning strategy. The plan included performance benchmarks against world best practice and a large capital investment program. Subsequent corporate plans reported on progress made towards achieving key objectives and refined strategies and performance targets for the next rolling five year period.

In 1992-93 State Rail commissioned a mid-term strategic review of progress towards achieving the goals set in the 1989 strategy. The review was conducted by Mercer Management Consulting. Amongst other things the review identified areas that required further attention (including train crew productivity; planning processes; capital program management; and industrial relations) and made a number of recommendations on the future strategic direction of StateRail.

The NSW Government’s decision to restructure StateRail into four new independent businesses required management to plan and execute the restructure. The restructure was a major challenge for management given the need to establish the new businesses from one organisation that was traditionally very large and complex. Similarly the process of corporatisation — whereby NSW rail freight operations were established as a separate corporate entity — presented management with a significant challenge.

Opening the NSW rail network up to competition has had a significant influence on FreightCorp’s strategic planning. FreightCorp (1997, p. 35) noted in its 1996-97 annual report that:

During FreightCorp’s first year the arrival of new operators in the rail market was the central factor behind the Corporation’s strategic planning. FreightCorp has developed plans to gain sustainable strategic advantage for each component of its business and is looking ahead to expand this business in both type and capacity.

Management practices

A number of measures have also been taken to improve management practices. One of the early responses to commercialisation was to revise StateRail’s management structure. This involved devolving decision making from head office to the business units and the country regions; flattening out the management structure; and increasing delegation and accountability.

Since the creation of FreightCorp management practices have continued to be improved. Under FreightCorp’s enterprise agreement a performance based management and remuneration system was implemented during 1998/99. This

system is geared towards employees being remunerated on the basis of their performance in relation to a series of pre-determined parameters agreed between employees and managers. A rewards and recognition scheme has also been established to recognise quality performance by employees.

FreightCorp has moved to recruit selected senior managers from outside the rail industry in order to draw on a wider range of skills and expertise that complement traditional rail operational skills. Furthermore senior managers are now remunerated under a market based system which involves a performance based contractual relationship.

FreightCorp has also developed its own policies and procedures in areas such as finance and human resources.

Management information systems

Moves to implement more effective planning and management practices put pressure on StateRail to develop new management information systems. Management required accurate information on such strategic measures as costs, profitability and asset utilisation to effectively implement change.

State Rail's Board therefore moved quickly to redevelop critical management information systems. The redevelopment of management information systems covered areas such as: operational performance; human resources; engineering; financial systems; and information technology. State Rail noted in its 1988~~9~~ annual report (p.9) that:

In order to implement and manage its strategic repositioning it is critical that State Rail has business systems and management controls of the highest quality. In parallel to repositioning its basic business, State Rail is also developing normal commercial business systems, using accrual accounting. It is also developing key operational performance indicators and implementing plans to monitor progress in its strategic repositioning.

For example, a program was initiated to upgrade the policies, procedures and financial systems of StateRail. The program included the adoption of accrual accounting and the establishment of new asset registers. Where appropriate the program involved the devolution of accounting responsibilities and functions to State Rail's business groups. The devolution of accounting responsibilities required the development of a new chart of accounts and the introduction of commercial accounting arrangements and controls.

To support the development of new business systems and management controls State Rail commenced a major redesigning and upgrading of its computer and

communications systems. This was a massive task and took several years to complete.

In 1996-97 FreightCorp implemented a new computer system MIMS (MINCOM Information Management System) to cover supply, fleet maintenance, human resources, payroll and finance functions.

FreightCorp has implemented a computer system to assist real time train planning and scheduling, monitoring and reporting. Coal wagons and locomotives have been fitted with automatic equipment identification tags and these are to be extended to the balance of the fleet. These systems provide the means to maximise rolling stock utilisation and allow the provision of the most up-to-date information to customers on train loads, availability and location.

FreightCorp has also developed a segment profitability reporting system to assist management in strategic planning. The system allows management to assess the profitability of individual market segments and the impact of specific business strategies.

Fleet management

The Booz.Allen & Hamilton report suggested there was considerable scope to reduce operating costs and improve efficiency by introducing better fleet management practices. Pressure to operate as a commercial business and growth in the rail freight volume have encouraged the adoption of better fleet management practices, while developments in communication and tracking technology have helped facilitate this change.

In 1989-90 Freight Rail began to dedicate some of its locomotive fleet to specific businesses instead of operating them from a pool. This was intended to increase locomotive utilisation and improve reliability. At the same time FreightRail adopted a wagon maintenance plan to improve wagon availability (which was down as low as 88 per cent at any one time). The plan involved the commissioning of two one-spot maintenance centres to undertake repairs of up to 8 hours duration. Other more substantial repairs were diverted to FreightRail's workshops or the private sector. The plan was intended to improve productivity and reduce maintenance costs.

Freight Rail continued to work to increase the size of freight trains to improve productivity.

Fleet management was also improved through the acquisition of new rolling stock and technology. The acquisition of locomotives under the ‘ready power’ contract enhanced fleet management by increasing the degree of standardisation and allowing the retirement of older less reliable locomotives⁵. By acquiring new coal wagons Freight Rail was able to reallocate older coal wagons to other market segments.

As mentioned earlier, in 1996/97 FreightCorp commissioned a real time train operating system to enhance train planning, programming, monitoring and rolling stock control. This system allows the maximisation of rolling stock utilisation and is backed by the statewide radio network allowing communication between train drivers, train controllers and trackside maintenance personnel.

Other examples of improved fleet management practices include the following.

- The introduction of on train (mobile servicing) which means that some servicing and out of course repairs are completed ‘on train’ so that locomotives are not removed from trains and shunted into the closest maintenance facility.
- Locomotive overhauls have been modified to component changeouts to reduce overservicing and to increase availability time.
- Major servicing periods for locomotives have progressively increased from 30 to 112 days. Composite brake blocks have reduced the frequency of service and increased availability.
- The maintenance cycle of wagon bogies has changed from time based to kilometre based servicing to effect major cost savings and reduced overservicing.

Work arrangements

More efficient and flexible work arrangements have been adopted in order to improve productivity. Key measures have included: reducing chronic overstaffing; job and work redesign; using enterprise bargaining to negotiate workplace reforms; and using training to enhance the skills of employees.

Staffing

In the late 1980s State Rail suffered from chronic overstaffing — notwithstanding the reductions in staffing levels that had occurred from the mid 1980s. Commercialisation put pressure on management to address this problem in order to

⁵ More details of the ‘ready power’ initiative are provided in this section under the heading ‘Investment in rolling stock and other rail infrastructure’.

reduce operating costs and improve efficiency. Improvements in job and work design and new technology have facilitated the transition to leaner rail freight operations.

Early in the reform process StateRail revised the resource requirements of each of its business units in order to tackle the problem of overstaffing. StateRail's management set the target of reducing its workforce by 45 per cent from around 33 100 as at 30 June 1989 to approximately 18 500 after five years (State Rail Annual Report 1988-89). The corresponding target for StateRail's freight operations was to reduce the workforce from around 16 000 to 9 000. The reduction in staff applied to both white and blue collar employees.

To achieve its downsizing objective StateRail offered voluntary redundancy packages. The NSW Government agreed to provide redundancy funding to assist State Rail meet its workforce targets.

Since corporatisation FreightCorp has accelerated reductions in its staffing levels. It has used redundancy packages to achieve these reductions — and funded the redundancy packages from its own resources.

As a result of efforts to address the problem of overstaffing there has been a sharp fall in the number of people employed in NSW rail freight operations since the late 1980s.

Job and work redesign

In the late 1980s inefficient and inflexible work practices were a significant impediment to improving the performance of NSW rail freight. Pressure to improve work practices has come primarily from microeconomic reforms and rail freight users. At the same time technological change has created opportunities to improve work practices — for example through new communication and tracking technology.

To improve work practices FreightRail initiated a job re-design program in the early 1990s. The program was intended to reduce operating costs and improve productivity by developing a more flexible and multi-skilled workforce. The job re-design program covered train crewing, yards and terminals, fleet maintenance, train management and administration. The program made significant progress towards achieving long term reforms by:

- identifying workloads;
- amalgamating work where possible to enhance time efficiencies; and

-
- introducing multiskilling to improve resourcing arrangements.

Box 4.9 provides some examples of improved work practices.

Industrial relations

The commercialisation and corporatisation of NSW rail freight required wide ranging changes to work and management practices. The implementation of these changes was facilitated by developments occurring in Australia's industrial relations system — in particular the move to enterprise bargaining.

State Rail's management pursued productivity enhancing changes through negotiation with its employees and unions. State Rail had a policy of full, open and direct consultation with unions regarding any change to conditions of employment or work practices. Employees were directly informed about workplace reform through regular staff reports and briefing sessions.

In 1991-92 State Rail negotiated a single award detailing common conditions of employment. The award rationalised the existing eight Federal awards and eight State awards into just one award with broadbanded and simplified pay scales.

From the early 1990s enterprise bargaining has provided a framework for negotiating productivity-enhancing changes in rail freight operations (box 4.10).

Box 4.9 Examples of improved work practices

Some examples of productivity enhancing changes to work practices include:

- The negotiation of new staffing arrangements for the one-spot wagon maintenance facilities at Port Waratah and Port Kembla. Under the new arrangements 17 employee classifications were amalgamated in one multi-skilled grade. The new arrangement offered significant productivity improvements and offered staff a wider variety of work.
- The extension of merit selection to all State Rail positions in January 1993.
- Locomotive servicing staff are now multiskilled in all the necessary competencies to allow them to carry out all facets of their task including driving fork lifts and operating cranes.
- More flexible work practices have been negotiated at yards and terminals across NSW. The aim has been to develop work arrangements that reflect the size, structure and operational demands of individual work places.
- As part of FreightCorp's Enterprise Agreement competency based classifications based on national standards have been introduced for train crews. This has removed many demarcation issues and restrictive work practices. The number of classifications has been reduced from 16 to 3 and the number of paypoints from 32 to 11. Allowances have been absorbed into competitive market payrates.
- FreightCorp was the first rail operator in Australia to utilise temporary traincrew to assist the management of resource utilisation in servicing the seasonal grain task. FreightCorp is currently investigating the feasibility of utilising casual and parttime employees.
- Under an agreement reached with GrainCorp — FreightCorp trains are crewed by GrainCorp staff on selected branchlines. Traditionally FreightCorp has provided train crew for the entire journey from silo to port. Under the new arrangement, GrainCorp staff will crew FreightCorp trains from major regional locations onto branchlines and will perform all the associated functions up to the mainline. The arrangement is designed to enable FreightCorp to manage periods of low harvest and concentrate on mainline train running. For GrainCorp the arrangement offers security of continued rail services along rural branchlines. The arrangement has allowed FreightCorp and GrainCorp to introduce more efficient work practices, achieve cost reductions and improve resource utilisation.
- FreightCorp has implemented driver only operations in the haulage of coal in South Australia. In NSW trialing of driver only operations has begun at unloading loops at coal loaders and it is planned to extend the trials to mainline operations in the third quarter of 1999.

Sources: State Rail and FreightCorp annual reports and information provided by FreightCorp.

Box 4.10 Enterprise bargaining

Work place reforms in NSW rail freight have been facilitated by the move to enterprise bargaining.

- State Rail's first enterprise agreement was certified by the Australian Industrial Relations Commission in November 1992. It included four elements: an enterprise agreement framework; payrates; classification structures; and conditions of employment.
- State Rail's second enterprise agreement was certified in November 1994 and focused on continuing work place reforms with a commitment to increasing productivity and achieving best practice standards.
- State Rail's third enterprise agreement was certified in February 1996. The parties to the agreement committed to working cooperatively to achieve the effective restructure of State Rail into separate business entities, to facilitate the transitional arrangements through various consultative mechanisms, and to continue the reform process to ensure the new organisations could compete effectively in their new environments.
- In June 1997 FreightCorp entered into its first enterprise agreement. The agreement which covers critical areas of FreightCorp's operations (including yards and terminals, maintenance and train crewing practices) establishes a framework for further management, operational and service delivery adjustments.
 - The agreement includes new competency-based classification structures that provide a framework for designing more flexible work arrangements.
 - The agreement puts in place a continuous improvement framework which focuses on benchmarking and improving key processes and systems.
- FreightCorp is currently in the process of negotiating its second enterprise agreement with unions and the Labor Council of NSW. FreightCorp aims to introduce further efficiencies through this agreement by way of workplace flexibility provisions and the continuation of structural reform initiatives that derive from its first enterprise agreement.

Sources: State Rail and FreightCorp annual reports and information provided by FreightCorp.

Training

In response to pressure to develop a commercial focus and customer orientated service culture within NSW rail freight there has been a strong emphasis on training. Freight Rail provided its employees with training opportunities to assist with the transition to a commercially orientated business. For example, it offered some employees a course 'Operating as a business'.

In 1991-92 State Rail organised its internal training capability into a separate business unit. StateRail Training was established to provide the major business

groups with training services on a fee-for-service basis. The client specified their training needs and State Rail Training delivered this training to agreed standards.

A wide range of training programs were offered by State Rail Training including: computer training, financial training, language and literacy training, and refresher courses for engineering staff.

In April 1995 State Rail implemented a Management Development Program (co-ordinated through the University of Technology, Sydney) to enhance and continuously improve the executive leadership, management competencies and skills of managers. The Program was designed from the Corporate Plan and the competencies identified as necessary for senior and middle managers. State Rail also introduced an Executive Forum to expose senior State Rail executives to a variety of leadership styles and business philosophies from across the public and private sectors. State Rail invited leaders from commerce, government and industry to address the forum and outline their challenges, plans and strategies.

FreightCorp has used training to enhance employee skills and foster a stronger customer service focus. For example, it has offered middle and upper management a course on 'Managing in the 1990s'. FreightCorp sponsors a course— Intermodal Management Systems Diploma — on transport logistics at Macquarie University. It also sponsors the Centre for Maritime and Intermodal Systems at the Macquarie Graduate School of Management.

FreightCorp has also worked in conjunction with its primary provider of technical training — Australian Rail Training — to develop competency based training and align training modules with job and work redesign outcomes (FreightCorp 1997, p. 31).

Investment in rolling stock and other rail infrastructure

Pressure to invest in rolling stock and other rail infrastructure has come from a variety of sources. Microeconomic reforms have created ongoing pressure to improve the efficiency of NSW rail freight operations and reduce operating costs. The poor state of NSW rail freight's rolling stock and other infrastructure in the late 1980s was a significant impediment to achieving these goals. On the demand side growth in the rail freight task (particularly in the last few years) and pressure from rail freight users to improve service quality — have encouraged new investment. Competition with road transport for a larger share of the general freight market has also encouraged new investment. At the same time technological change has created opportunities to invest in rolling stock and other infrastructure that embodies productivity enhancing technology.

In 1991-92 Freight Rail decided to acquire a fleet of new heavy freight locomotives on a 'ready power' basis. This innovative approach to locomotive acquisition was based on American best practice — whereby the railway leases the use of locomotives while they are owned and maintained by the original supplier, their local affiliates and financiers.

Under the contract FreightRail acquired the use of 31 4000hp locomotives (supplied by North American General Motors ElectreMotive Division) and 58 Australian built 3000hp locomotives. The 4000hp locomotives were acquired for Freight Rail's Hunter Valley coal haulage operations. Under the contract the locomotives were owned and maintained by the Clyde Consortium and FreightRail was charged on a perkilometre basis. At the time the contract was signed the consortium was able to offer availability and reliability levels well above those Freight Rail had been able to achieve. The first of the new locomotives was delivered in early 1994.

The locomotives acquired under the 'ready power' contract enabled Freight Rail to reduce its fleet size while increasing capacity. Fleet reliability was improved as a result of the retirement of older locomotives and fleet maintenance costs were reduced.

In May 1992 Freight Rail placed a contract for new generation coal wagons. The wagons are able to carry 95tonnes of coal — 27per cent more than the largest wagons at that time. The acquisition of the new wagons improved wagon availability, allowed the retirement of older lower capacity wagons and reduced maintenance costs. By November1998 the acquisition of a further 400 of these new coal wagons by FreightCorp had increased the capacity of HunteValley Coal operations to 92 million tonnes per annum (FreightCorp 1998, p. 3).

In addition to investing in new rolling stock FreightRail also undertook significant investment in other items of rail infrastructure to improve the efficiency and productivity of its operations. Examples of the types of investment undertaken by Freight Rail include the following.

- A remote controlled crossing loop at Goobang Junction near Parkes was commissioned in 1991-92 which allowed FreightRail to operate longer trains in western NSW.
- The upgrading of metropolitan freight lines between Tempe and Flemington.
- Upgrading and rationalising fuelling facilities across NSW.
- A new train radio system which used stateof-the-art technology and included the provision for a Global Positioning System to track locomotive location via satellite. The new radio system allowed the introduction of streamlined

signalling and safeworking systems, permitting major reforms to Freight Rail's train operations with resultant improvements in train and crew productivity.

- The construction of 'one spot' wagon maintenance centres at Port Waratah and Port Kembla. These maintenance facilities were designed to minimise out-of-service wagon time and reduce maintenance costs.
- Redeveloping the Enfield marshalling yard to provide a modern, efficient, world class marshalling facility. The new complex was designed to allow the marshalling of longer trains.
- Upgrading railway tracks and signals in key areas of the State. The change to new signalling systems and the laying of concrete sleepers and heavier tracks, together with associated earth and drainage works cut infrastructure maintenance costs and accommodated the new wagons with their greatly enhanced carrying capacities.

FreightCorp has continued to undertake targeted investment in rolling stock, facilities and systems. Examples include:

- the acquisition of new coal wagons;
- the development of new intermodal terminals as part of FreightCorp's Portlink Strategy; and
- fitting coal wagons with automatic equipment identification tags to enhance the tracking and utilisation of rolling stock.

Rationalisation of services and facilities

Microeconomic reforms created pressure to rationalise some of NSW rail freight's services and facilities. Prior to microeconomic reform there had been a lack of political support for rationalising uneconomic services (NSW Commission of Audit 1988, Appendix A.2, p. 5). By moving the operation of rail freight services to be more 'at arms length' from government, commercialisation gave management more opportunity to take hard decisions. At the same time commercialisation made management more responsible for performance and created pressure to reduce operating costs and improve efficiency.

In 1989-90 Freight Rail conducted a reassessment of the entire freight network in order to identify areas and commodities where continued service was no longer viable or commercially justified. Consequently, services were withdrawn from very low-volume high-maintenance grain branch lines and replaced by road haulage. Despite this, more than 95 per cent of rail freight services were maintained.

The experience of parcels and small freight services provides an interesting example of the rationalisation of services in the era following commercialisation (box 4.11). Even after commercialisation it took a number of years to close these non-commercial services.

The rationalisation of rail facilities has included:

- the closure of the Broadmeadow rail yards in Newcastle;
 - traffic was consolidated at Port Waratah to achieve operational efficiencies and improved service delivery;
- freight yard facilities in Sydney following the commissioning of the new Enfield Yard;
- maintenance facilities following the completion of the ‘One Spot’ wagon maintenance facilities at Port Waratah and Port Kembla; and
- fuelling and crewing depots.

Pricing policies

Commercialisation and opening the NSW rail network up to competition has put pressure on NSW rail freight to adopt more commercial pricing policies. Pressure has also come from rail freight users (for example, the export coal industry) — which have lobbied the NSW government for many years to adopt more commercial and transparent pricing policies.

There has been a significant real reduction in freight rates since the late 1980s. Between 1988-89 and 1995-96 there was a real reduction of up to 25 per cent in coal and grain freight rates (information provided by FreightCorp). In the first two years after corporatisation freight rates fell on average by 16 per cent in real terms (PC 1998a, p. 12).

Box 4.11 The rationalisation of parcels and small freight services

State Rail's parcels and small freight services were provided by the Trackfast Division (part of Freight Rail). This rail freight business was a significant drain on State Rail's finances over a number of years. The Booz.Allen & Hamilton report had recommended that State Rail withdraw from providing parcels and small freight services given the likely small financial returns even if State Rail succeeded in turning this business operation around. At the time a survival plan was implemented to try and make small freight operations commercially viable.

After continuing to sustain heavy losses State Rail's Board recommended to the Minister in December 1991 that Freight Rail withdraw from this business. The Government however declined to accept the Board's recommendation concerned that the withdrawal of Trackfast would leave much of country NSW without a small freight service at realistic rates.

Trackfast was eventually closed in October 1996 soon after corporatisation. The decision by FreightCorp's Board was taken following a review which found that despite a series of restructures implemented over a number of years, and even with Government financial support, the operation was continuing to incur massive financial losses.

For several years before its closure a large part of Trackfast's operations had been subcontracted to road haulers.

Sources: State Rail and FreightCorp annual reports.

While the export coal industry acknowledged that freight charges were falling in the early 1990s it argued that this reflected little more than the reduction in unit costs which should have arisen from the increased coal volumes being hauled. For example Dunlop (1995, p. 23) noted that:

To be fair to the current NSW rail operator, FreightRail, improvement has occurred in recent years and freight rates have been reducing. However, the bottom line, in terms of freight charges to the coal industry, reflects little more than the reduction in unit costs which would have arisen from the increased coal volumes flowing through the system. The root cause of these problems is the total lack of competition.

For many years a key concern of the coal industry has been the use of freight rates to extract monopoly rents. The NSW Government incorporated monopoly rents in coal freight rates to help fund other State Rail loss-making services. The practice significantly distorted rail freight pricing and distracted governments from focusing on providing efficient rail freight services (PC 1998b, p. 192). The coal industry has been particularly critical of the use of rail freight rates as a taxation mechanism and of the rate of phasing out of this practice.

However the PC report (1998b, p. 194) into the Australian black coal industry noted that monopoly rents in NSW are being phased out over four years to July 2000:

With the creation of the Rail Access Corporation (RAC) and FreightCorp, and in preparation for the introduction of competition in rail freight, the monopoly rent component and the losses on hauls not covering avoidable costs have been estimated and incorporated in the RAC's access prices. This leaves FreightCorp free to price on a commercial basis. The monopoly rents, as estimated by the NSW Government, are being phased out over four years to July 2000.

FreightCorp has developed a pricing policy that shares the benefits from improved efficiency and cost reductions to customers. The strategy recognises that there is a range of customers, commodities transported and service criteria around which to tailor its pricing. The pricing strategy provides incentives for volume and investment; performance based bonuses and penalties; and pricing packages for individual customers.

4.5 Productivity performance

There has been a significant improvement in the measured productivity performance of NSW rail freight operations since the early 1980s — notwithstanding the limitations of the available productivity data (box 4.12). Today a much larger freight task is being successfully hauled with significantly fewer employees, locomotives and wagons (figure 4.2). Furthermore, there is some evidence that by the early 1990s NSW rail freight was moving closer to world best practice.

Measurement and other issues

Productivity is a measure of the rate at which inputs are turned into output. It compares the rate at which outputs (of goods and services) are produced from given amounts of one or more inputs. Improvements in productivity occur if more output is produced with fewer inputs, or if the same output is produced with less inputs.

Four partial productivity measures are used to assess performance — labour, locomotive, wagon and track productivity. A partial productivity measure divides output by the amount of a single input used. For example, labour productivity is calculated as output divided by the amount of labour used.

In principle, multifactor productivity can give a more comprehensive measure of performance because it includes the influence of a number of (major) inputs. Multifactor productivity is calculated by dividing output by a combination of inputs

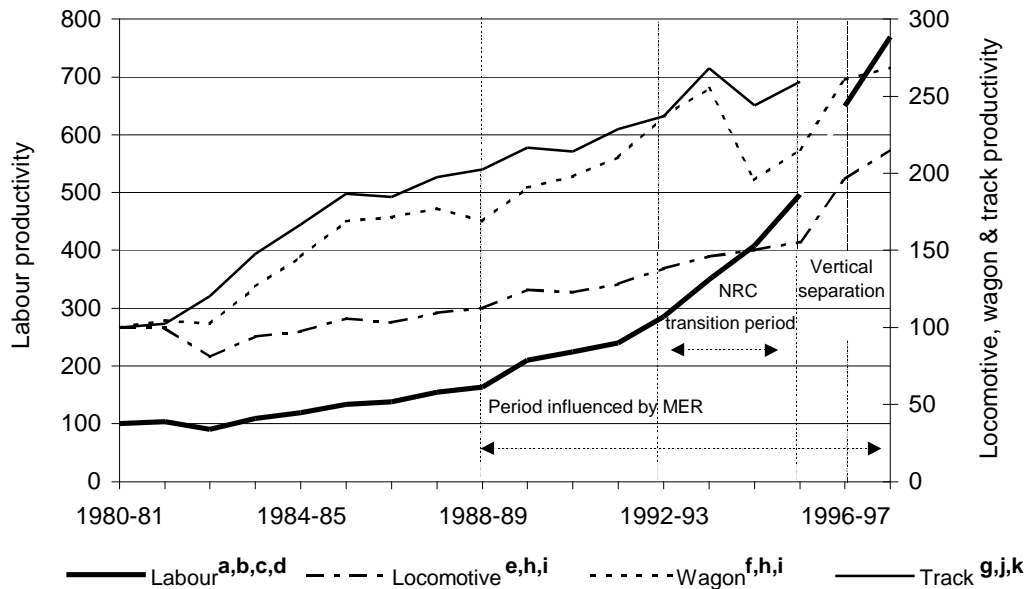
Box 4.12 **Interpreting NSW rail freight's productivity performance**

NSW rail freight operations have been through some significant changes between 1980-81 and 1997-98. Some of these changes have resulted in breaks in the available data series. As a result care needs to be exercised in interpreting changes in NSW rail freight's productivity performance — particularly from the early 1990s. The changes that have most affected the consistency of the data series are:

- The introduction of a new chart of accounts and full commercial accounting practices from 1 July 1991. This resulted in some changes in the measurement of financial flows and asset stocks.
- In the early 1990s State Rail's interstate rail freight operations were transferred to the National Rail Corporation (NRC). For a number of years State Rail continued to provide interstate rail freight services under contract to the NRC while the phased transfer of operations and assets was completed. At the time interstate rail freight accounted for around 10 per cent of the total tonnage hauled by FreightRail.
 - The data include interstate rail freight services up until the mid-1990s (unless otherwise indicated). When long haul interstate rail freight operations drop out of the data there is a one-off fall in measured productivity because higher levels of productivity are achieved on longer-haul routes than on shorter haul-routes. This effect is particularly evident in the wagon productivity data.
 - While the data show transfers of inputs to the NRC at particular times (locomotive and wagons from 1994-95 and labour from 1995-96) in practice the transfers took place over a number of years. Further, the transfers of interstate freight services and their associated inputs did not necessarily occur at the same time. As a result, the productivity estimates over the transfer period are not totally reliable.
 - The transfer of interstate operations to the NRC may have implications for the performance of NSW rail freight operations in the years immediately after the transfer. This is because of the lags required to reduce rolling stock, such as locomotives and wagons as a result of the reduced freight task.
- For most of the period covered in this case study rail freight services were provided by State Rail on a vertically integrated basis. As a result the data for State Rail's freight operations include staff employed in areas such as track maintenance and signalling. In contrast FreightCorp is an 'above rail' operator and not responsible for track and related infrastructure.
 - At the time FreightCorp was created, around 3 000 staff employed in the areas of infrastructure maintenance and network control were transferred to the Railway Services Authority and Network Control (a division of the new State Rail Authority) respectively. This transfer constituted about one half of their work force. As a result of the reduction in staff numbers there would have been a large one-off increase in measured labour productivity.
 - With the vertical separation of rail freight operations track productivity is no longer a relevant indicator of performance. FreightCorp is not responsible for the track network.
- To the extent contracting out has changed over time the true growth in productivity may be slightly exaggerated.

Figure 4.2 **Labour, locomotive, wagon and track productivity, 1980-81 to 1997-98**

Index 1980-81 = 100



a The labour data exclude National Rail Corporation estimates from 1995-96. **b** When FreightCorp was created on 1 July 1996 all employees involved with infrastructure maintenance and network control were transferred to the Railway Services Authority and Network Control (a division of the State Rail Authority) respectively. **c** The labour productivity data for the years 1980-81 to 1995-96 do not include corporate staff numbers. **d** The labour productivity data for 1996-97 and 1997-98 is based on the total number of employees (ie. including corporate staff). **e** Locomotive productivity is defined as net tonne kilometres per locomotive. **f** Wagon productivity is defined as net tonne kilometres per wagon **g** Track productivity is defined as net tonne kilometres per track kilometre. **h** The locomotive and wagon data for 1994-95 and 1995-96 are from Freight Rail's register, whereas in previous years, the figures were compiled from the State Rail Authority total fleet register. **i** The locomotive and wagon data exclude National Rail Corporation resources from 1994-95. **j** The track data exclude CityRail track. **k** The track data include interstate track.

Data sources: State Rail Authority and FreightCorp annual reports.

(for example labour and capital). However multifactor productivity is often more difficult to measure with precision — particularly on the capital side. For this reason partial productivity measures were used in this case study⁶.

⁶ It should be noted that the scope and coverage of this case study differs from that of the Productivity Commission's inquiry into the rail industry *Progress in Rail Reform*. This case study focuses on the productivity performance of NSW rail freight operations over the period 1980-81 to 1997-98, drawing data mainly from State Rail and FreightCorp annual reports. The rail inquiry reported on progress in rail reform since 1991 and on the potential for further reform. Its focus was on 'rail system' performance rather than the performance of individual organisations, measuring performance in terms of rail system productivity and outcomes for stakeholders. The rail inquiry collected data from a variety of sources including *The Performance of Government Trading Enterprises 1991-92 to 1996-97*, central data agencies overseas, information sought directly from Australian railways and railways overseas, and railway annual reports.

Productivity performance

In assessing NSW rail freight's productivity performance since 1980-81 two features stand out about the period influenced by microeconomic reforms (1988-89 to 1997-98). Firstly, overall productivity growth appears to have accelerated — although not to the extent indicated by the labour productivity data. Secondly, structural and operational improvements have made a larger contribution to improved productivity than in the period prior to reform (1980-81 to 1988-89).

Table 4.1 indicates that the productivity performance of NSW rail freight operations has improved markedly since 1980-81. Significant gains were achieved in the period prior to microeconomic reform (ie. 1980-81 to 1988-89) but productivity growth appears to have accelerated since 1988-89. The growth in labour productivity may overstate the growth in overall productivity. However, the other partial measures are also positive and mostly show high rates of growth. Therefore, labour productivity growth can be seen as a reasonable indicator of this trend in overall productivity growth although actual rates will be somewhat overstated.

- Between 1980-81 and 1988-89 average annual growth in labour, locomotive, wagon and track productivity was 7.3 per cent, 2.3 per cent, 8.7 per cent and 10.3 per cent respectively.
- Between 1988-89 and 1992-93 average annual growth in labour, locomotive, wagon and track productivity was 13.3 per cent, 4.5 per cent, 8 per cent and 3.8 per cent respectively.
- Labour productivity growth appears to have accelerated further between 1992-93 and 1997-98 notwithstanding the data problems for this period.
 - The labour productivity estimates in Table 4.1 are not totally reliable after 1992-93 because of the formal exclusion of NRC resources from 1995-96 and the affects of the vertical separation of freight and track operations in July 1996. Nevertheless it is reasonable to conclude that labour productivity growth was stronger between 1992-93 and 1997-98 than between 1988-89 and 1992-93. For example, in the period before labour was transferred formally to the NRC and before vertical separation (ie. 1992-93 and 1994-95) — average annual labour productivity growth was 19.7 per cent between 1992-93 and 1994-95 compared with 13.3 per cent between 1988-89 and 1992-93.

Table 4.1 NSW rail freight – average annual growth rates

Per cent

| | <i>Labour Prod.</i> | <i>Loco. Prod.</i> | <i>Wagon Prod.</i> | <i>Track Prod.</i> | <i>Output (NTKs)</i> | <i>Labour</i> | <i>Loco.</i> | <i>Wagons</i> | <i>Track</i> |
|--------------------------|-------------------------|------------------------|------------------------|------------------------|--------------------------|---------------|--------------|---------------|--------------|
| 1980-81 to 1982-83 | -5.0 | -10.1 | 1.1 | 9.7 | -7.3 | -2.4 | 3.6 | -8.5 | -15.5 |
| 1982-83 to 1985-86 | 13.4 | 8.7 | 17.9 | 15.5 | 14.2 | 0.7 | 4.9 | -3.0 | -1.1 |
| 1985-86 to 1988-89 | 7.4 | 2.5 | 0.3 | 3.1 | 0.4 | -6.7 | -2.2 | -0.2 | -2.7 |
| 1980-81 to 1988-89 | 7.3 | 2.3 | 8.7 | 10.3 | 4.8 | -2.3 | 2.5 | -3.6 | -5.0 |
| 1988-89 to 1992-93 | 13.3 | 4.5 | 8.0 | 3.8 | 1.3 | -10.8 | -2.3 | -6.1 | -2.4 |
| 1992-93 to 1997-98 | 22.2 ^a | 9.4 | 2.3 | .. | -4.1 ^b | -22.2 | -11.6 | -5.7 | .. |

.. not applicable. ^a This figure overstates the extent of the improvement in labour productivity over this period. At the time FreightCorp was created, around 3,000 staff employed in the areas of infrastructure maintenance and network control were transferred to the Railway Services Authority and Network Control respectively. This transfer represented about one half of their work force. As a result of the reduction in staff numbers there would have been a large one-off increase in measured labour productivity. ^b This figure includes interstate rail freight services which were transferred to the NRC during this period. If interstate rail freight services are excluded from the data the average annual growth rate would be 6.9 per cent. This is largely driven by very strong output growth since 1995-96.

Sources: Based on State Rail and FreightCorp annual report data.

- The locomotive productivity data is affected by the exclusion of NRC estimates from 1994-95. Average annual growth in locomotive productivity was 4.9 per cent between 1988-89 and 1993-94; and 14.1 per cent between 1994-95 and 1997-98.
- The sharp fall in wagon productivity growth is largely due to the exclusion of NRC estimates from 1994-95. Average annual growth in wagon productivity was 8.2 per cent between 1988-89 and 1993-94; and 12.1 per cent between 1994-95 and 1997-98.
- ... The data suggest that wagon productivity growth may have slowed in the last couple of years. In 1997-98 the percentage change on the previous year was only 3 per cent. In large part this is likely to reflect the buildup of some excess capacity in the coal wagon fleet through the acquisition of new wagons. The acquisition of 400 high capacity coal wagons has increased the capacity of HunterValley coal operations to around

92 million tonnes per annum — considerably more than the 61.6 million tonnes of coal actually hauled in 1997-98 (FreightCorp 1998, p. 3).

- With the vertical separation of rail freight operations in July 1996 track productivity is no longer a relevant performance indicator — and as a result data are unavailable for the years 1996-97 and 1997-98.

Further evidence that the productivity performance of NSW rail freight operations has improved significantly in the period influenced by microeconomic reforms comes from comparisons with world best practice. Notwithstanding the considerable difficulties in comparing the performance of different rail operators, the available evidence suggests that NSW rail freight has been moving closer to world best practice.

In the late 1980s, a report by consultants Booz, Allen & Hamilton had found that the labour productivity of StateRail's freight operations was only 20 per cent of the norm for North American railways, even though StateRail enjoyed a more favourable traffic mix.

In 1993, Mercer Management Consulting reviewed StateRail's progress in achieving the objectives that had been set in its 1989 strategic repositioning plan. The report found that the labour productivity of StateRail's freight operations would exceed the original target by 1993. In addition, Mercer updated the original target to allow for productivity improvements made by other world railways since 1989. The consultants found that in 1993 labour productivity would be around 94 per cent of the updated target.

In the early 1990s, the Bureau of Industry Economics (BIE) conducted a number of international benchmarking exercises on Australia's rail freight industry. The BIE found that between 1991-92 and 1993-94 the amount by which FreightRail needed to reduce operating costs to match world best practice costs had fallen from 36 per cent to 27 per cent (BIE 1995, p. 76).

The Productivity Commission's inquiry into the rail industry *Progress in Rail Reform* included a comparison of the total factor productivity growth rates for freight services of government-owned Australian railways and a sample of North American railways. Over the period 1990 to 1997, StateRail Authority's⁷ total factor productivity growth rate was about the same as that of the average of North American railways. However, when the data are adjusted to take account of the

⁷ As the rail inquiry focused on rail system performance its discussion of NSW rail freight operations was in terms of the State Rail Authority of NSW. For the years 1996-97 and 1997-98 this included the operations of the Rail Access Corporation, FreightCorp, Rail Services Authority and the new StateRail Authority.

transfer of interstate freight services to the NRC, State Rail Authority's performance was substantially better than the performance of North American railways. The adjusted data also indicate that the State Rail Authority's average annual total factor productivity growth rate between 1995-96 and 1997-98 was higher than between 1989-90 and 1994-95 (PC 1999, pp. 70-72).

An important question is whether NSW rail freight's improved productivity performance has come from an increase in output, a decrease in inputs or both.

For almost the entire period productivity improvement appears to have been driven by a combination of an increase in output and a decrease in inputs (figure 4.3).

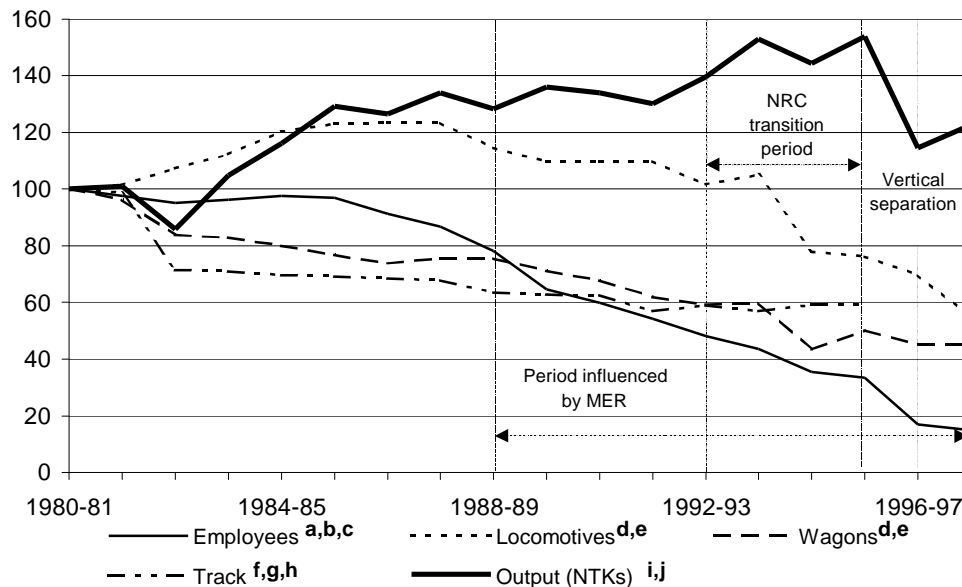
However there does appear to be a significant difference between the periods before and after microeconomic reform in terms of what was driving productivity growth.

In the period prior to microeconomic reform productivity growth appears to have been driven largely by strong output growth. This suggests that improved productivity was largely achieved through greater utilisation of excess capacity.

- Between 1980-81 and 1988-89 output grew on average by 4.8 per cent a year. Over the same period the number of employees, wagons and track kilometres contracted on average each year by 2.3 per cent, 3.6 per cent and 5 per cent respectively. The size of the locomotive fleet expanded over this period — growing on average by 2.5 per cent a year.
- Most of the improvement in productivity in this period occurred between 1982-83 and 1985-86 when output growth was particularly strong relative to input growth (figure 4.3). This output growth was driven largely by a rapid expansion in export coal haulage. During the early 1980s Australia's exports of thermal coal increased rapidly — largely due to oil prices being between 2 and 3 times higher than thermal coal (measured in energy equivalent units) (PC 1998b, p. 12). In 1986 the price of oil collapsed and growth in thermal coal exports slowed.

For much of the period influenced by microeconomic reform productivity growth appears to have been driven largely by reductions in resource inputs. This suggests that productivity growth has come largely from structural and operational improvements, rather than output changes.

Figure 4.3 NSW rail freight – selected input and output measures
Index 1980-81 = 100



a The employment data up to and including 1987-88 are estimates calculated using the labour productivity and net tonne kilometres data. **b** The employment data excludes National Rail Corporation resources from 1996-97. **c** When FreightCorp was created on 1 July 1996 all employees involved with infrastructure maintenance and network control were transferred to the Railway Services Authority and Network Control (a division of the State Rail Authority) respectively. **d** The locomotive and wagon data for 1994-95 and 1995-96 is from Freight Rail's register, whereas in previous years the figures were compiled from the State Rail Authority total fleet register. **e** The locomotive and wagon data excludes National Rail Corporation resources from 1996-97. **f** The track data excludes CityRail track. **g** The track data includes interstate track. **h** The track data has been estimated using the track productivity and net tonne kilometres data. **i** Output is measured in net tonne kilometres. **j** The net tonne kilometres data excludes National Rail Corporation resources from 1996-97.

Data sources: State Rail Authority and FreightCorp annual reports.

- Between 1988-89 and 1992-93 output grew on average by only 1.3 per cent a year. Over the same period the number of employees, locomotives, wagons and track kilometres contracted on average each year by 10.8 per cent, 2.3 per cent, 6.1 per cent and 2.4 per cent respectively.
- The lack of consistent data for the period after 1992-93 makes it hard to assess the relative importance of output growth and reductions in inputs to measured productivity growth. While table 4.1 overstates the reduction in resource inputs over this period compared to earlier periods because of the transfer of some resources to the NRC — some significant reductions in resource inputs have nevertheless occurred. Between 1992-93 and 1995-96 the number of employees, locomotives and wagons used in NSW rail freight operations contracted each year on average by 12.3 per cent, 11 per cent and 7.9 per cent respectively. Over the same period output grew on average by 2.4 per cent a year. On balance it appears reasonable to conclude that structural and operational improvements

continued to make a substantial contribution to measured productivity growth over this period.

- Since 1995-96 output growth has been much stronger— with average annual growth between 1995-96 and 1997-98 of 13.5 per cent.

While the productivity performance of NSW rail freight operations has improved significantly since the late 1980s there is scope for further improvement. For example, the Productivity Commission's rail inquiry showed the level of total factor productivity of NSW government rail freight operations was below the North American average — even allowing for differences in scale and other factors (PC 1999, pp. 68-70). The rail inquiry found there was scope to implement further reforms to improve productivity and reduce operating costs.

4.6 Assessing the influence of microeconomic reforms

This section uses the information provided thus far to assess the relative contribution of microeconomic reforms to the improved productivity performance of NSW rail freight operations. It also attempts to sketch in broad terms the mechanisms through which microeconomic reforms have improved productivity.

As a starting point it is useful to draw out some of the key points from the preceding discussion.

- By the late 1980s State Rail had serious operational and structural problems and was burdened by large annual operating losses and mounting debt. Management were aware of these problems but on the whole little progress had been made. Management's ability to make wideranging changes was inhibited by political intervention and a non-commercial organisational culture that had grown up over many years. In part State Rail's non-commercial organisational culture reflected the lack of a clear corporate mission and an expectation that the government would continue to fund large annual operating losses.
- The measures State Rail had taken from the mid-1980s to improve the commercial performance of its operations were unlikely to have been sufficient to turn the organisation around and had not addressed many of the underlying sources of inefficiency.
- State Rail's freight operations had achieved relatively strong productivity growth in the early 1980s but these gains had largely been achieved through greater utilisation of excess capacity associated with increased export coal haulage.
- Since the late 1980s pressure for change has come from a variety of sources: microeconomic reforms; variations over time in the rate at which the rail freight

task has been growing; rail freight users; technological change; and competition from road transport.

- Microeconomic reform commenced in 1988 with the NSW Government's decision to commercialise its rail operations. This represented a significant change in government policy towards NSW rail operations.
- Since the late 1980s the managers of NSW rail freight operations have made wide ranging structural and operational changes to reduce operating costs, improve efficiency and customer service.
- NSW rail freight operations have achieved some impressive gains in productivity since the late 1980s. The evidence suggests that productivity growth accelerated during this period. For much of this period productivity growth appears to have been largely driven by reductions in resource inputs. This suggests that productivity growth has come mostly from structural and operational improvements.

To assess the contribution of microeconomic reforms it is necessary to come to some judgement about what NSW rail freight's productivity performance would have been in the absence of reform.

What would have happened in the absence of reform?

It is impossible to say with certainty what would have happened to the productivity performance of NSW rail freight operations in the absence of reform. Nevertheless the evidence suggests that since the late 1980s microeconomic reform has made a substantial contribution, both direct and indirect, to the improved productivity performance of NSW rail freight operations.

Although labour productivity was improving prior to the reforms of the late 1980s, the rate of growth accelerated after the changes were implemented and was maintained through the 1990s. Productivity growth prior to the reforms was largely driven by strong output growth, reflecting strong demand. For most of the period since 1988, reductions in resource inputs and associated organisational improvement appear to have been the main source of growth.

The importance of microeconomic reform is that it made a substantial contribution to changing the focus and organisational culture of NSW rail freight operations. These changes appear to have been pivotal in encouraging and enabling management to make wide ranging structural and operational changes during the 1990s to reduce operating costs and improve efficiency.

The main changes which enhanced the productivity performance of NSW rail freight operations included: rationalisation of non-commercial services and facilities; enterprise restructuring; new management structures and information systems; more flexible work practices; investment in new rolling stock and other rail infrastructure; increased contracting out of specialised services; developing strategic partnerships with other key players; and adoption of new technology.

In the absence of reform it is difficult to see the other sources of pressure identified in this paper having a significant impact on NSW rail freight's productivity performance. In part this reflects the nature and extent of the structural and operational problems confronting StateRail in the late 1980s. While State Rail had been the subject of numerous studies by consultants — prior to microeconomic reform there was little incentive or opportunity for management to make fundamental changes to address these problems.

Demand pressures alone are unlikely to have been sufficient to encourage wide ranging structural and operational changes. There had been strong output growth in the early 1980s and yet longstanding sources of inefficiency had not been addressed. In the absence of microeconomic reform State Rail would have been able to continue to rely heavily on capital investment to expand capacity rather than look for ways of improving efficiency — as it did not bear the financing costs of its investments. Furthermore responsiveness to pressure from rail users would have been weakened by the lack of a commercial focus; the lack of competition in key markets; and an organisational culture used to governments funding large annual operating losses.

In the absence of microeconomic reform it is likely that the full benefits of adopting new technology would not have been realised. For example it is likely that the productivity pay-off from acquiring new locomotives and wagons would have been reduced by longstanding structural and operational inefficiencies — such as restrictive work and rostering practices; and poor fleet management practices.

Competition from road transport is likely to have provided some pressure for change. However it is important to recognise that the loss of market share to road in the general freight market has been a long term trend. Up until the late 1980s the pressure of competition from road transport does not appear to have been sufficient to encourage management to make substantial structural or operational changes. It was not until microeconomic reform provided the catalyst for significant changes to NSW rail freight's operating environment that management could really begin to respond to competition from road transport.

The most likely scenario is that the productivity performance of NSW rail freight operations would have continued to improve in the absence of microeconomic reform — but at a much slower rate and to a lesser extent than has been achieved over the last decade. For much of the period productivity gains would have needed to come primarily from structural and operational improvements because of slower output growth. But it is unlikely that the necessary changes would have been implemented without the direction, incentives and momentum provided by the reforms.

In the absence of microeconomic reform it is likely that State Rail would have continued to drift on burdened with large operating losses and escalating debt. State Rail would not have had an organisational culture or structure conducive to effectively implementing the kind of changes needed to significantly improve the efficiency of rail freight operations.

The mechanisms linking microeconomic reforms and productivity

Section 4.4 outlined some of the measures State Rail and FreightCorp took in response to the pressures to improve the performance of rail freight operations. These measures suggest some broad mechanisms through which microeconomic reforms are likely to have led to improved productivity — some examples include:

- restructuring State Rail into business groups;
- developing an organisational culture more conducive to improving productivity (for example through training initiatives);
- rationalising non-commercial services and facilities (for example closing parcel and small freight services);
- investing in new rolling stock and other rail infrastructure (for example new heavy haul locomotives, high capacity coal wagons and a new train marshalling yard at Enfield);
- better management practices (for example improved strategic planning and fleet management);
- better work practices (for example redesigning jobs and work and reducing overstaffing);
- increased specialisation (for example through contracting out and vertically separating rail freight operations);
- developing strategic partnerships with other key players (for example the agreement on train crewing with GrainCorp); and

-
- new technology (for example fitting coal wagons with automatic identification tags to enhance tracking, utilisation, and customer/train information).

Through some of these mechanisms microeconomic reforms are likely to have improved allocative efficiency. In the short to medium term this is most likely to have been through rationalising noncommercial services and pricing reforms. In the longer term improved allocative efficiency is likely to have come through better management and work practices releasing underutilised resources from the rail freight industry.

More substantial gains in productivity are likely to have come from improved technical and dynamic efficiency. Improved technical efficiency is likely to have come through investment in new rolling stock and other rail infrastructure and increased specialisation. Gains in dynamic efficiency are likely to have come through restructuring State Rail into business groups; developing a new organisational culture; and developing strategic partnerships with other key players.

5 Yarra Valley Water

by CTC Consultants¹

5.1 Introduction

As governments continue to search for greater efficiency in the provision of both goods and services, tools of microeconomic reform (MER) such as corporatisation, privatisation and competitive tendering and contracting have become increasingly important. There is no question that competitive tendering has gained considerable currency in recent years as an instrument of MER. In the US, UK, Australia and New Zealand it has been used extensively to raise efficiency levels and quality of service in the public domain. Services such as refuse collection and cleaning have produced successful contractual solutions for many years now and more complex services such as IT maintenance and financial services are becoming more prevalent in the contracting arena.

Savings from the introduction of competitive tendering and contracting have been estimated to be in the order of 20 per cent, on average. In its 1996 study entitled *Competitive Tendering and Contracting by Public Sector Agencies*, the Industry Commission estimated the value of contracts for services across the three tiers of the Australian public sector to be approximately \$13.5 billion. In fact, the benefits of introducing competitive tendering and contracting were estimated to be between \$1.3 and \$7.3 billion. These savings were achieved regardless of whether the service was provided by an in-house team or by the private sector.

Given the apparent success of contracting at the aggregate level, the objective of this case study is to focus on how the introduction of the competitive process impacts productivity at the level of the individual contract. Furthermore, the case study will attempt to show the mechanisms through which contracting can lead to productivity improvements. Following a detailed selection process and consultation with the Productivity Commission, the civil maintenance contract for the water supply and

¹ The CTC Consultants report was received in October 1998. The Commission has introduced some minor editorial changes to present the report in a way consistent with other case studies. Responsibility for the material rests with CTC Consultants.

sewer system at Yarra Valley Water was selected as the subject of this case study as it is acknowledged as an area of increasingly significant reform in Australia.

In order to illustrate the mechanisms through which contracting has led to productivity improvements, the case study will consider the following issues: how contracting has changed the way civil maintenance services are provided at Yarra Valley Water, service delivery performance levels following the introduction of contracting, and the wider impact of the reform on Yarra Valley Water's operational success. Before this can be achieved, however, it is necessary to understand the regulatory environment in which Yarra Valley Water currently operates and the overarching reform of the Victorian water industry over the last five years.

5.2 Background

Reform of the Victorian water industry

The reform of the water industry in Victoria, which was heralded by the passing of the *Water Industry Act 1994*, was aimed at introducing a greater degree of commercialisation and improving customer service levels in what was regarded as an effective but rather inefficient industry. As such, the reform package reflected the Liberal Kennett Government's reform agenda which had the objectives of increasing productive efficiency, reducing public debt and improving the customer focus of government business enterprises. Contracting out, therefore, can be seen as a policy response to one of the Victorian Government's key microeconomic reform objectives: to increase the efficiency of government-funded services through the use of market mechanisms. This policy platform was announced in 1993 as part of the Management Improvement Initiative.

For the greater Melbourne area, the central platform of the water reform package related to the disaggregation of Melbourne Water into 5 separate entities:

- Melbourne Water Corporation; which retained responsibility for wholesale water and the management of Melbourne's dams, reservoirs and sewerage treatment plants;
- City West Water, South East Water and Yarra Valley Water; three new water retail businesses which purchase water in bulk from Melbourne Water Corporation and collect and transport sewerage from customers in their geographical areas; and
- Melbourne Parks and Waterways; which is a statutory corporation responsible for managing Melbourne's network of parks and waterways.

The separation of Melbourne Water into five separate entities came into effect on 1 January, 1995. Similar structural changes were made to the water industry in regional Victoria, with the creation of new water and sewerage businesses servicing distinct geographical regions in rural Victoria. The creation of the three new water retail businesses in Melbourne was done in accordance with the three pre-existing administrative regions within the integrated Melbourne Water. The three new businesses covered the following areas:

- City West Water: Melbourne’s central business district, Richmond and western Melbourne;
- South East Water: south eastern Melbourne and parts of the Dandenongs and Mornington Peninsula; and
- Yarra Valley Water: north and eastern Melbourne and the Yarra Valley.

Each of the businesses is responsible for service delivery, management of the water and sewerage network assets, and financial viability. Each water retail business was restructured to provide a commercial balance sheet and to ensure that they operated above the minimum efficient scale. The turnover of each business is between \$300 and \$400 million.

All of the water retail businesses are owned by the State and operate under the stewardship of a board of directors, which is appointed by the State Government. While the management of the businesses is given a high degree of autonomy and is encouraged to operate on a commercial basis, there are a number of regulatory obligations that need to be considered given their status as government-owned businesses. The main regulatory consideration relates to the introduction of operating licenses for the water retail businesses, which are enshrined in the *Water Industry Act 1994*.

The operating licenses provide comprehensive information on the retailer’s obligations to their customers, the performance standards they must achieve (which relate to water quality, sewer spill containment and restoration of water supply), price regulation and trade waste guidelines. In essence, the operating licenses act as a regulatory substitute for the lack of actual competition for customers in the reformed water industry. This is often referred to in the economics literature as ‘yardstick competition’ or ‘competition by comparison’, where performance information is used to promote rivalry between firms. At this stage of the reform process, the water retailers cannot compete for customers — the geographical area for each of the businesses determines the customer base.

The operating licenses compel the water retailers to: guarantee provision of water and sewerage services to all connected properties in their geographical area; provide

free water to some Government departments; observe the customer charter; extend the water and sewerage services to new developments and residences; maintain appropriate water conservation programs; and prepare and maintain accounts according to pre-determined principles. The operating licenses are effective for three years, after which time they can be renewed pending satisfactory performance levels.

The government authority charged with administration of the water industry is the Office of the Regulator-General, which was created in July 1994. The Regulator-General is also responsible for other utilities such as gas and electricity and other services such as ports, grain and rail services. With regard to the water industry, the Regulator-General has the following objectives:

- to ensure the maintenance of an efficient water industry;
- to protect the interests of customers with respect to charges and terms and conditions of services; and
- to facilitate the maintenance of a financially viable water industry.

It is the Regulator-General's role to ensure that water retailers are operating in accordance with the licenses. If the Regulator-General detects non-compliance with the operating license, it has the power to impose penalties on the licensee, or even in extreme instances, to revoke the license. The Regulator-General conducts regular operational audits to validate compliance with the licenses.

Description of Yarra Valley Water

Yarra Valley Water is the largest of Melbourne's three water retail businesses - it provides water and sewerage services to 1.5 million people in a service area covering 3500 square kilometres in Melbourne's northern and eastern suburbs. Furthermore, Yarra Valley Water manages and maintains a network of 9427 kilometres of water mains and 7678 kilometres of sewerage pipes. It also owns and operates 13 regional sewerage treatment plants, and 61 water and 58 sewerage pump stations. Yarra Valley Water's assets are significant: in 1996-97, its water assets were valued at \$310 million and its sewerage assets were valued at \$696 million. In comparison, City West Water maintains 3200 kilometres of water mains and 3000 km of sewerage mains and South East Water maintains 7500 kilometres of water mains and 6700 kilometres of sewerage mains.

Since commencing operations, Yarra Valley Water has performed very well financially. In 1995-96, its first full financial year, the business made an after tax profit of \$56.5 million. In 1996-97, further gains were made which resulted in a net

profit of \$73.9 million. This was achieved through increasing revenue by 4 per cent and reducing costs by 5.2 per cent (or \$2.5 million). Yarra Valley Water employs 346 people in total, most of whom are located at its head office in Mitcham.

5.3 Yarra Valley Water's civil maintenance services

Given the size of Yarra Valley Water's water and sewerage network and the importance of the network to the successful operation of the business, it is hardly surprising that one of its biggest expenses each year is on maintenance of the network. There are three types of work required on the network: civil, mechanical and electrical. Civil maintenance relates mainly to the network of pipes and conduits that supply water or transport sewerage. Mechanical maintenance covers pumping stations and valves, while electrical maintenance involves power supply and switching and control equipment.

Maintenance work can be either scheduled or unscheduled. The difference between the two, for example, is that unscheduled maintenance work is undertaken when there is a burst water main whereas scheduled maintenance work is designed to prevent burst water mains. The same distinction applies to maintenance of the sewerage network. The focus of this case study is on civil maintenance work for the water and sewerage network, which accounts for five times as much work as the combined mechanical and electrical maintenance work.

The specific tasks involved in the civil maintenance of the water and sewerage network are:

- to repair burst water mains and fittings, repairing water service pipes and fittings, and sealing leaking water mains, pipes and fittings;
- to clear blocked sewers, repair collapsed sewers and by-pass pumping of sewer overflows;
- to provide regular non-urgent remedial maintenance services;
- to provide scheduled maintenance and inspection services;
- to conduct minor works to augment the existing water and sewerage network; and
- to attend to water and sewerage pump station alarms.

Pre-contracting period (pre-1993)

Contracting for maintenance services did not start until 1993. Prior to this, maintenance services at Melbourne Water were provided by a day labour force. It is important to note that the breaking up of Melbourne Water did not come into effect until 1995. So, the pre-contracting period (and, in fact, the first two years of the first contract) related to Melbourne Water's three separately administered regions: Maribyrnong, South East and Yarra.

The organisation at this time was characterised by strong union dominance, particularly in the area of maintenance activities, where the Australian Workers' Union (AWU) was the main workers' union. From Melbourne Water's perspective, the least favourable aspect of the day labour operation was that it proved ineffective in dealing with the variable nature of unscheduled maintenance work. Because the majority of work performed by maintenance workers is unscheduled, the total volume of maintenance work is very unpredictable as it depends on the frequency of burst water mains and sewer blockages. Employing a day labour force proved to be an inefficient way to provide maintenance services because Melbourne Water had to employ workers during the troughs in the work cycle. To put it another way, the day labour maintenance workers were often under-utilised. Furthermore, Melbourne Water management believed that a number of poor work practices, such as excessive penalty pay rates and unnecessary overtime, had built up over time.

Some time in 1992, Melbourne Water started exploring new ways to resolve these problems. A senior Melbourne Water executive flew to New Zealand to observe the operation of the newly reformed water utilities. One of the features of the operation in New Zealand was the proliferation of contracting for services such as maintenance in order to improve service levels and productivity. While not convinced that the New Zealand model provided all of the solutions, senior Melbourne Water managers were interested in New Zealand's experience because it provided the best contracting model to date.

As a result, Melbourne Water started to experiment with the idea of contracting for non-strategic areas such as small infrastructure projects. The final decision to abandon day labour operations was made following a bitter strike which was organised by the AWU in 1992. During the strike, managers at Melbourne Water were forced to go out and fix burst water mains themselves, with the assistance of sub-contractors. This episode only heightened the tension between management and maintenance workers and demonstrated two clear messages to management: the notion put forward by the unions that maintenance work was highly skilled was simply not true and that managers were now galvanised in their efforts to find a better operational framework.

First contract period (1993-1996)

On 6 March 1993, Melbourne Water advertised for registrations of interest to provide civil maintenance services for each of its three administrative regions. In other words, three separate contracts were to be awarded. A methodology was developed in order to evaluate the large number of organisations that registered interest in the project by the closing date of 22 March. Each of the registrations was given a low, medium or high rating by the evaluation committee on the basis of the pre-determined criteria. Price Waterhouse was commissioned by Melbourne Water to undertake an independent review of the processes used to select the civil maintenance contractor.

Following the evaluation of the registrants, it was decided that eight companies should be invited to submit a tender for the contract. These companies covered a broad range of Australian and international engineering, construction, facilities management and water utility companies. In order to promote competition, Melbourne Water made it clear to all prospective tenderers that no single company would be allowed to win more than one of the three contracts on offer.

Following an exhaustive tender evaluation process, Melbourne Water's board of directors approved the decision to award 'preferred tenderer' status to Serco (for the Yarra region), Thiess (South East region) and Transfield (Maribyrnong region). As soon as they had been awarded 'preferred tenderer' status, both Thiess and Transfield negotiated directly with the AWU offering their members an increase in pay and employment conditions. Separate enterprise agreements, offering terms and conditions in excess of the award, were entered into with both Thiess and Transfield.

This development had a significant impact on Serco's ability to attract new staff for the civil maintenance contract in the Yarra region. Serco proposed in its tender documentation to employ 105 ex-Melbourne Water staff, but this proved difficult to fulfill because Serco refused to pay the higher wages offered by Thiess and Transfield. Consequently, the AWU placed a ban on its members negotiating with Serco. Following protracted negotiations between the parties in dispute, and reference to the Industrial Relations Commission, the matter was finally resolved when Serco agreed to offer similar pay and conditions to Thiess and Transfield. The civil maintenance services contract with Serco for the Yarra region commenced operations in August 1993.

The first significant change introduced by contracting involved the inclusion of a schedule of rates, which detailed more than 100 different types of maintenance activities, all of which had to be individually priced by Serco. There were also some

inclusions for labour and plant hire rates for work which did not have a separate payment item on the schedule of rates. The major advantage of this system of work was that it provided Melbourne Water with precise data on the work that was being undertaken and when it was done. In other words, it provided them with accurate information on costs and productivity, which is vital for the efficient operation of all businesses. It is important to note that none of this information was collected before the introduction of contracting out.

The second factor introduced by contracting which impacted efficiency and productivity was the introduction of a new computerised asset management system, which was owned and managed by Melbourne Water. By utilising this new technology, Melbourne Water was able to issue works orders electronically to Serco's office and then Serco would report back when the specific maintenance activity was completed. This proved to be a fast, accurate and reliable means of issuing works orders to the contractor and for validating when the work was completed. Moreover, the introduction of the new computer system made it possible to more effectively manage the separation of purchaser from provider. Without it, issuing works order by paper requests to a separate office would have been a logistical nightmare.

The introduction of this new technology was one of the few areas where capital-labour substitution was observed during the contracting out process. The nature of the maintenance services work is such that it is highly labour-intensive. Although there is some new equipment which assists in the diagnosis of the cause of sewer blockages and water mains bursts, the work is still labour-intensive.

The operation of the first contract term with Serco straddled the reform initiatives that were being undertaken at the industry level. As already mentioned, Melbourne Water was broken up into three water retail businesses from 1 January 1995. As a consequence of this separation, the majority of the work contained in the contract with Melbourne Water was simply transferred to the new entity, Yarra Valley Water. At the time of the creation of the water retail businesses, the Government introduced a series of performance indicators which effectively laid down minimum standards and Yarra Valley Water established a series of priority classifications for both water and sewerage services. Both water and sewerage works were classified as either Priority 1, 2 or 3.

For example, a Priority 1 water supply problem was defined as "a complete failure to maintain continuity or quality of water supply to a group of customers or to a critical user at a critical time". Typical causes of a Priority 1 water supply problem include burst water mains, valve failures and broken hydrants. The performance standard stipulated for Priority 1 water supply problems was that rectification of the

problem had to be commenced within 1.5 hours and completed within 5 hours in 100 per cent of the cases.

Similarly, a Priority 2 sewerage problem was defined as “a minor failure to contain sewerage within the sewer system or any problem affecting several users”. Typically, such a problem would be the result of a cracked pipe or a partial blockage of the sewer. The performance standard identified was that 90 per cent of cases had to be rectified within 24 hours, and the remaining 10 per cent had to be rectified within 36 hours. Each works order issued by Yarra Valley Water was given a priority status and the ability of the contractor to attain the prescribed performance standard was verified. Given the volume of work, it would have been very labour-intensive and time consuming to quickly issue works orders to a contractor without the introduction of the computerised asset management system. In this way, the changes introduced since maintenance services were contracted out has unquestionably increased labour productivity of the service.

For the most part, the civil maintenance services contract with Serco was a resounding success. For instance, Serco agreed to wear a Yarra Valley Water badge on their uniform, which has aided in the new management team’s endeavours to create a strong brand name and corporate identity. Despite the rapidly changing regulatory environment, Serco proved to be flexible enough to adapt to these changes and continually search for new ways to improve their service. And there was no doubt that the quality and productivity had improved.

However, the contract was not without its difficulties. On 22 March 1995, Yarra Valley Water’s contract quality manager wrote to Serco expressing concern about a detailed study of working hours which concluded that there were a number of instances of maintenance staff working excessive hours. In the letter, the contract quality manager made it clear that it was Serco’s responsibility to ensure that adequate labour resources were available at call. The implication of this letter to Serco was quite clear: tired workers are not productive workers. Yarra Valley Water was also concerned that over-working the maintenance staff could lead to deterioration in the quality of work.

Second contract period (1996-present)

Although the contract with Serco was not due to expire until 23 August 1996, the decision was made on 5 December 1995 by the Yarra Valley Water board of directors to once again test the market and not simply roll over the existing contract into a new three-year contract. On 9 December 1995, expressions of interest were

advertised. Following this process, five companies were registered to tender for the new civil maintenance contract. Only four of the five registrants submitted a tender.

There were a number of reasons behind Yarra Valley Water's decision to consider their future civil maintenance contractor nine months prior to the expiry date. The major factor was that the other water retailers had signalled their intention to review their civil maintenance contracts early. Yarra Valley Water believed that this strategy would deliver three clear benefits: determine their maintenance budget for the next financial year; provide the best opportunity to compete with the other water retail businesses for the best civil maintenance contractor; and to provide sufficient time to prepare for any changes which may occur if a new contractor is to come on board. The re-bidding process also provided the opportunity to make significant improvements to the existing contractual framework and performance standards. In particular, the objectives of the new contract were to:

- specify precise outcomes;
- share the risks equitably between parties;
- benchmark performance against best practice;
- maintain strategic control over maintenance activities;
- provide low direct and administration costs; and
- include incentives to exceed minimum service standards.

Following the evaluation of the tenders, it was decided to award the new civil maintenance contract to Transfield, who were the lowest-priced bidders. This time around, Serco was the highest of the bidders. As noted already, South East Water and City West Water were also reviewing their civil maintenance contracts at the same time. As it turned out, Yarra Valley and City West Water ended up swapping civil maintenance contractors. Serco was awarded the City West Water contract and Transfield was awarded the Yarra Valley Water contract.

This had some additional benefits for Yarra Valley Water - Transfield had already won the combined mechanical and electrical maintenance contract in 1994 - so, the awarding of the new civil maintenance contract to Transfield greatly simplified the contractual interface for Yarra Valley Water. Yarra Valley Water and Serco agreed to terminate the contract on 18 August 1996, once adequate measures were in place to ensure a smooth transition to Transfield. Yarra Valley Water management praised the high level of professionalism Serco displayed during the handover to Transfield.

5.4 Productivity analysis

Definition of productivity

There are a number of different measures of productivity that are used in the economics literature: labour productivity, capital productivity and total factor productivity being the three most common forms. For this particular case study, labour productivity has been utilised as the most appropriate indicator to analyse how contracting out has impacted productivity levels. The reason for this is simple: the service activity selected for this case study, civil maintenance services, is highly labour-intensive and little capital-labour substitution was observed during the transition to contracting out.

The definition of labour productivity that has been used is as follows:

$$\begin{aligned}\text{Labour Productivity} &= \frac{\text{Total Output}}{\text{Total Inputs}} \\ &= \frac{\text{number of maintenance activities}}{\text{total number of man-hours}}\end{aligned}$$

Therefore, Labour Productivity = x activities per man-hour

One important assumption being made in the labour productivity calculations is that all maintenance activities require the same effort. This is clearly not always the case. For instance, one major sewerage blockage may require far more effort and man-power to fix than a simple leaking valve in the water mains. Similarly, there are different types of water main bursts - one may require a lot of effort because of its hard-to-reach location under a main road, while another may be far simpler to fix. However, there is no clear way to determine whether water supply maintenance activities require more effort than sewerage maintenance activities, say. In any case, the proportion of water supply to sewerage maintenance activities does not vary significantly from year to year in our data set.

Data collection

As is always the case in empirical economic studies, access to good quality data is the key. For the data used in this case study, we have relied on information supplied by Yarra Valley Water, Melbourne Water, Serco and Transfield. Through its works order computer system, Yarra Valley Water keeps accurate records of the number and type of maintenance service activities performance by the contractor. For

example, Yarra Valley Water keeps records of 23 different categories of water service maintenance activities and 20 different categories of sewerage service maintenance activities. The contractor also produces monthly operating performance reports, which contain information on the frequency, quantity and cost of maintenance activities by different categories. This information has provided the basis for the output data used in the labour productivity calculations.

Because the contractual framework utilises a schedule of rates, Yarra Valley Water does not keep records of labour inputs for maintenance activities. Contractors are paid for maintenance work at pre-determined rates, irrespective of the number of hours it takes to complete a task. However, the contractor does keep records of how many man-hours it takes to complete a job. This information provided the basis for the input data used in the productivity calculations. Where this level of detail hasn't been available, proxies for labour inputs have been estimated using data on the number of men employed and the average number of hours in a working week.

Data in the pre-contracting era is not as easy to collect and is often not in the same form as the contracting data. For instance, because there was no schedule of rates prior to the introduction of contracting, it is much harder to determine the exact number of maintenance activities performed. In order to determine the output data in the pre-contracting era, we have used the average of the three-year estimates provided by Melbourne Water to the prospective tenderers in 1993. This provides the best proxy for maintenance output levels at that time. On the input side of the equation, Melbourne Water employed a day labour force which was on-call to provide maintenance service services. But because staff weren't paid hourly, records were not kept of the total number of man-hours employed. Therefore, the total number of staff (which was obtained from Melbourne Water historical data) has simply been multiplied by the average working work.

However, any comparison between contracting and non-contracting productivity outcomes must be treated with caution because the non-contracting result will under-estimate the productivity outcome. The reason for this is that typically the total input figure includes non-productive hours. That is, it includes time when the labour was idle, in the sense that there was no work to be done. As already explained, much of the maintenance work is of an unscheduled nature — when a water main bursts, a maintenance crew is sent out to fix it. So, in the old Melbourne Water days, there were periods when maintenance staff were being paid but not doing any work. Therefore, the labour productivity calculations made during this period will have to be treated with some caution.

As a countervailing argument to this, it also must be noted that the labour data from the pre-contracting period does not include any allowance for overtime worked by

day-labour staff because no accurate estimates of this could be found. It was acknowledged, however, that maintenance jobs at Melbourne Water usually involved working overtime and that this represented one way in which staff could supplement their otherwise low wage.

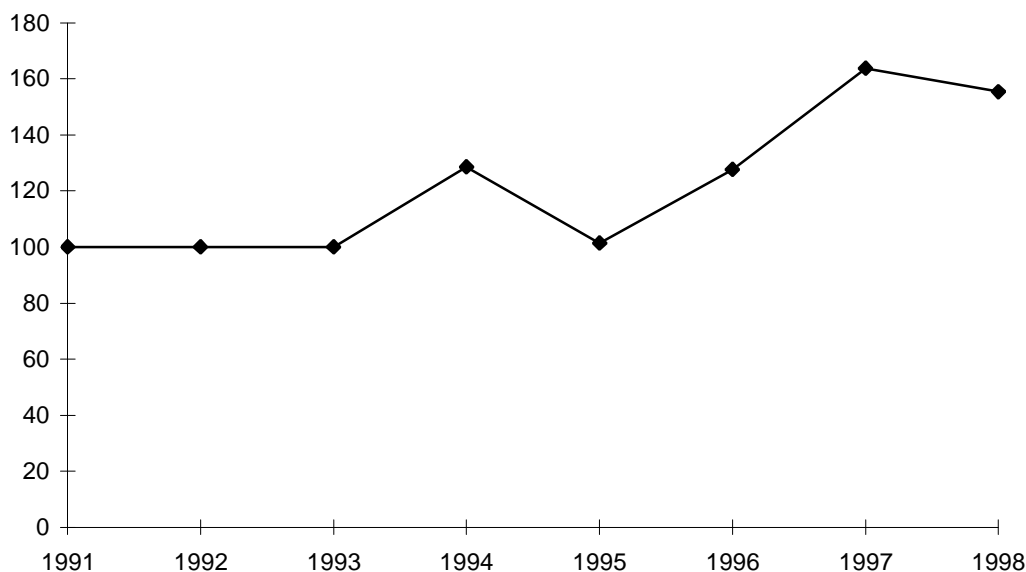
Another issue which became apparent during the data collection process was that the estimate of preventative (scheduled) maintenance work provided by Melbourne Water in 1993 was much higher than the actual levels reported by the contractors. It is not clear whether the Melbourne Water figures were over-stated or whether the contractors were ignoring important preventative maintenance work. If the latter is true, it may have serious consequences for the frequency of water and sewerage interruptions and for the water authority's capital replacement strategies because a sub-optimal level of preventative maintenance may reduce the effective life of the water and sewerage network.

Comparison of civil maintenance productivity levels

In order to calculate productivity levels across the three different periods, total outputs were divided by total inputs and then multiplied by 100 to give the number of maintenance activities performed per 100 man-hours. The labour input data was tabulated in calendar years which does not directly correlate with the contracting periods. For instance, the contract with Transfield started in August 1996, but because average labour inputs for the entire year have been used, the figure used for 1996 relates solely to the Serco inputs. The figures for 1997 and 1998, however, relate entirely to data from the Transfield contract. This approximation means that it is difficult to compare the contractors' productivity performance from year to year with any accuracy.

Figure 5.1 charts the development of labour productivity levels over time. Productivity levels are measured in terms of maintenance activities per hundred man-hours.

Figure 5.1 Labour productivity levels in civil maintenance, 1991 to 1998
Index 1990-91= 100



Note: Maintenance output levels for 1991 to 1993 are estimated as an average of the three years.
Data source: Yarra Valley Water.

Figure 5.1 clearly supports the conclusion that labour productivity levels have risen since the introduction of contracting. While there has been some fluctuation since 1993, the overall trend has been upwards.

The Regulator-General's performance report

Critics of contracting often argue that achievements such as cost reductions and productivity increases have been achieved through reductions in quality of service. This is generally known as the 'quality shading hypothesis'. It is not possible in this case study to conclusively determine whether contracting has led to quality shading because the data on quality simply does not exist prior to the introduction of contracting.

Since the reform of the Victorian water industry, however, the Office of the Regulator-General has collated data from the three water retailers into a performance report. The objective of the report is to compare the performance of the three businesses with respect to quality of water, reliability of service, affordability and customer service — all of which have well-defined performance indicators which are outlined in the operating licenses.

While the Regulator-General's report provides interesting comparisons on water quality issues, it is the comparison of water supply reliability which is of particular

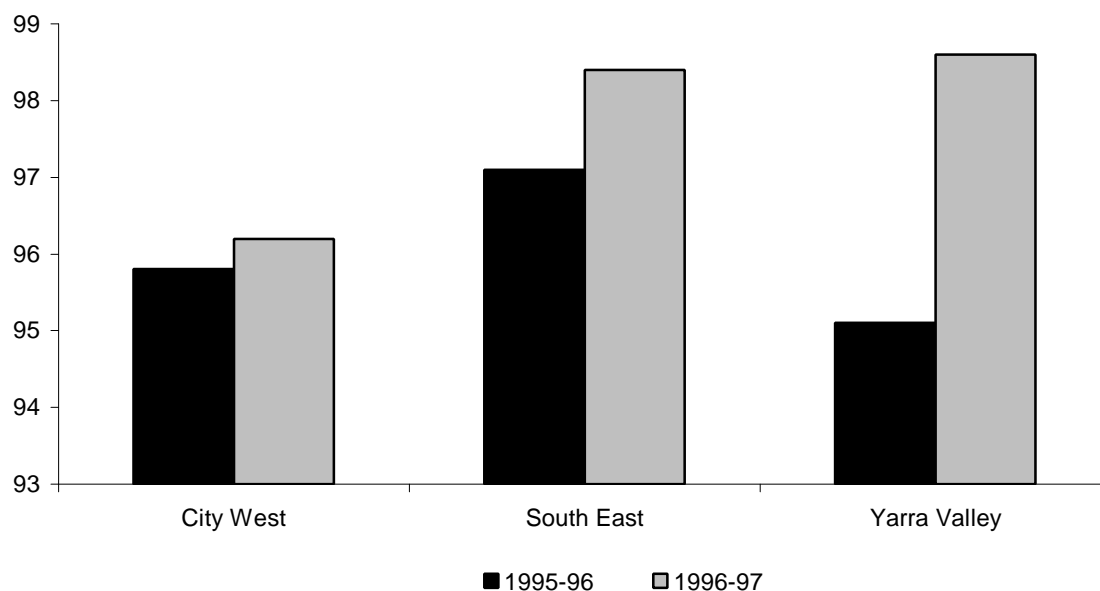
interest, given our focus on the maintenance side of the retailers' operations. The reason for this is that water supply reliability provides performance measures on how well the maintenance service providers are responding to problems in the water and sewerage networks. The performance report publishes reliability performance indicators relating to the frequency of interruptions (number of interruptions per 100 kilometres of main) and the time taken to restore supply (percentage of interruptions restored within five hours) for both water and sewerage services.

The frequency of water supply interruptions can be affected by factors which have little to do with the competence of the maintenance contractor. For example, unplanned water supply interruptions increased by 42 per cent across Melbourne in 1996-97, primarily because of an extremely hot and dry summer. Dry weather causes a greater number of water mains bursts because the ground shrinks as it dries, which cracks the pipes. Similarly, dry weather usually increases the number of sewerage mains breaks as tree roots search for water. Both of these factors played a role in the increased number of maintenance activities in Melbourne in 1996-97. The comparison between retail businesses shows that South East Water had the lowest rate of water supply interruptions (53 per 100 kilometres of main, which represents a 23 per cent increase on 1995-96), followed by Yarra Valley Water (78 per 100 kilometres of main, a 53 per cent increase on 1995-96) and City West Water (109 per 100 kilometres of main, a 49 per cent increase on 1995-96).

While the frequency of water mains bursts has little to do with the contractor's performance, the responsiveness to bursts certainly does. With regard to unscheduled water interruptions, the Regulator-General's report shows that Yarra Valley Water was able to restore 98.6 per cent of interruptions within 5 hours (up 3.5 per cent from 1995-96), followed by South East Water with 98.4 per cent (up 1.3 per cent from 1995-96) and then City West Water with 96.2 per cent (up 0.4 per cent from 1995-96), all of which are above the minimum standards. In an attempt to improve performance standards even further, Yarra Valley Water is now looking at improving the proportion of water and sewerage services restored within 4 hours.

The improvements in responsiveness were achieved despite the huge increase in the volume of work, which placed enormous pressure on the maintenance contractors. It also placed enormous pressure on the water retailers' maintenance budgets, which had to absorb the additional costs associated with the increased volume of work. Figure 5.2 shows how the water retail businesses have responded to restore water supply interruptions in 1995-96 and 1996-97.

Figure 5.2 Unplanned water supply interruptions restored within 5 hours
Per cent



Data source: Melbourne's Retail Water and Sewerage Companies, Performance Report, March 1998, Office of the Regulator-General, Victoria.

In order to benchmark these results against other similar water authorities in Australia, statistics from the Water Services Association of Australia's (WSAA) publication *WSAAfacts'97* were used. WSAA is a professional water industry association which was incorporated in 1995 by the major urban water authorities in order to provide a national focus for the interests of the water industry. In terms of water mains breakages, WSAA reported that Brisbane Water had 52.19 breaks per 100 kilometres of main in 1996-97 (up from 35.61 in 1995-96), Hunter Water had 39.33 breaks per 100 kilometres of main in 1996-97 (down from 44.28 in 1995-96), and SA Water had 22.74 breaks per 100 kilometres of main in 1996-97 (down from 26.79 in 1995-96).

In terms of responsiveness to water service interruptions, Brisbane Water restored water services in 85 per cent of cases within 8 hours in 1996-97 (down from 97 per cent in 1995-96), Hunter Water restored water services in 89.4 per cent of cases within 5 hours in 1996-97 (down from 92.5 per cent in 1995-96) and SA Water restored water services in 97.7 per cent of cases within 8 hours in 1996-97 (down from 99 per cent in 1995-96).

The Regulator-General's performance report also produces comparative analyses of sewerage service reliability indicators. The indicators of reliability are: frequency of service failure (number of sewer blockages per 100 kilometres of main) and

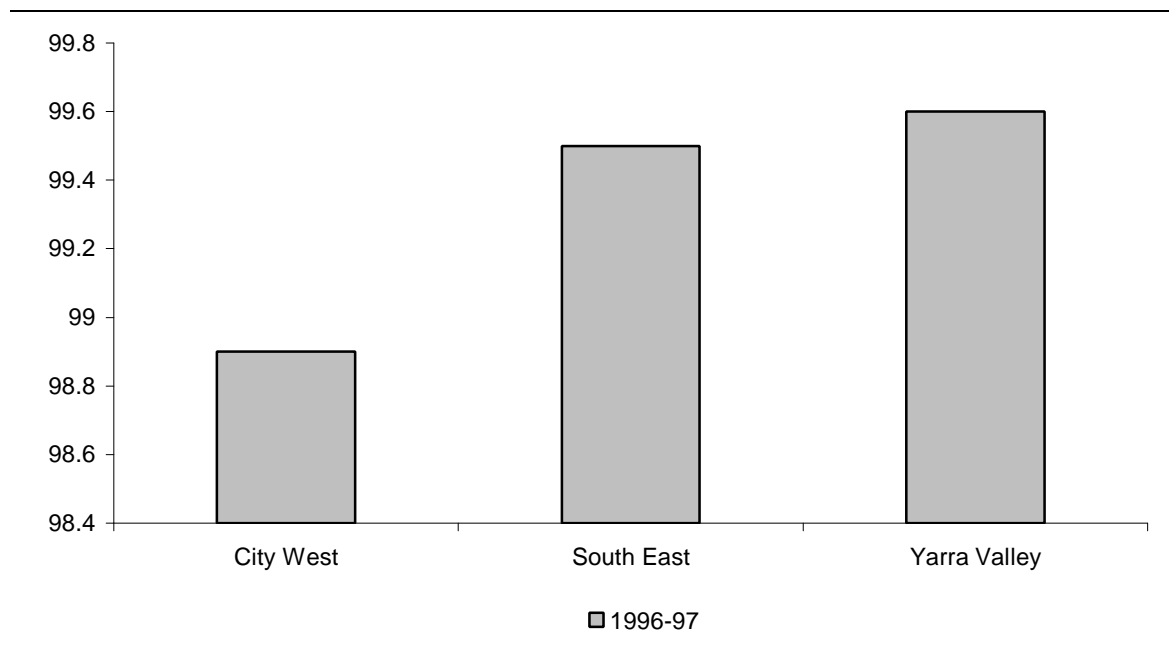
responsiveness to service failure (percentage of sewer spills contained within five hours). According to their operating licenses, the water retailers are required to achieve the following performance standards:

- restore sewerage services as soon as possible where the interruption is caused by a fault in the licensees' system;
- ensure that customers have no more than three sewerage service interruptions in a year;
- fully contain at least 90 per cent of sewer spills within five hours; and
- minimise damage and inconvenience to customers following a sewer spill.

The March 1998 performance report shows that South East Water's sewer blockage frequency was the lowest in 1996-97 with 13 blockages per 100 kilometres of main (down 25 per cent on 1995-96), followed by Yarra Valley Water with 20 blockages per 100 kilometres of main (down 33 per cent on 1995-96) and City West Water with 37 blockages per 100 kilometres of main (down 28 per cent on 1995-96). The overall reductions in sewer blockages can be attributed to increased rates of sewer cleaning and treatments to suppress tree root growth, and the introduction of programs to reduce the food industry's discharge of fats into the sewerage system.

Once again, it is the responsiveness of the contractors to maintenance work which is of interest in this case study. Figure 5.3 shows that City West Water (98.9 per cent), South East Water (99.5 per cent) and Yarra Valley Water (99.6 per cent) have all been successful in restoring sewerage services within five hours in at least 90 per cent of the cases. The general conclusion from these results is that the maintenance contractors for all three water retail businesses have been performing to a very high standard. In particular, at Yarra Valley Water there is no evidence at all to suggest that productivity improvements have been made at the expense of quality of water or sewerage services.

Figure 5.3 Sewer spills contained within 5 hours 1996-97
Per cent



Data source: Melbourne's Retail Water and Sewerage Companies, Performance Report, March 1998, Office of the Regulator-General, Victoria.

In order to benchmark these results against similar water authorities, statistics from *WSAAfacts'97* were once again used. In terms of sewer blockages, WSA reported that Hunter Water had 75.11 blockages per 100 kilometres of main in 1996-97 (up from 72.14 blockages in 1995-96) and Sydney Water had 70.25 blockages per 100 kilometres of main in 1996-97 (down from 93.16 blockages per 100 kilometres of main in 1995-96). In terms of responsiveness, Hunter Water restored sewerage services in 97 per cent of cases within 5 hours in 1996-97 (up from 95 per cent in 1995-96) and Sydney Water restored sewerage services in 94.30 per cent of cases within 5 hours in 1996-97 (down from 94.78 per cent in 1995-96).

5.5 Conclusions

The objective of this case study was to analyse the impact of competitive tendering and contracting on labour productivity levels in civil maintenance services at Yarra Valley Water and to analyse the mechanisms through which these labour productivity changes may have occurred. To put these developments in the right context, the overall reform of the Victorian water industry, which including the separation of wholesale and retail water utilities and the commercialisation of the industry as a whole, was also considered.

As expected, the quantification of labour productivity levels before and after microeconomic reform initiatives were undertaken proved to be very difficult. The source of the problem was the quality of the data — prior to contracting, data on inputs and outputs was just not monitored as closely. Therefore, reliable proxies for the number of maintenance activities and labour inputs had to be estimated using historical Melbourne Water data. This was made possible by the fact that many of the current management team at Yarra Valley Water previously worked for Melbourne Water (Yarra region) — their knowledge of the water industry in general and of the changes in civil maintenance activities proved invaluable. There were also major problems with the accuracy of the labour input data in the contracting phase. It proved almost impossible to determine how many hours the collective contract maintenance workforce put in - it was obvious that the contractors used less maintenance staff, but it was difficult to obtain accurate estimates of the average number of hours worked per week.

Despite these data collection problems, we were able to make some very robust estimates of labour productivity during and after the introduction of contracting out. The overall conclusion of the productivity analysis was that labour productivity has increased since the 1994, which was the first full year of Serco's operation of the civil maintenance contract. This is reflected in Figure 5.1, which shows an upward trend in productivity levels over time. The mechanisms through which these improvements were made include: the introduction of new computerised technology aimed at improving the efficiency of issuing works orders; the increased focus on business processes brought about by contracting; the separation of the purchaser from the provider which assisted in focusing both sides on the importance of inputs and outputs; and the increased flexibility of the labour market which allowed the contractor's to utilise their staff more effectively.

References

- Automotive Industry Authority (AIA) various years, *Report on the State of the Automotive Industry*, AGPS, Canberra.
- Booz Allen & Hamilton 1989, *Executive summary: Diagnostic Review and Strategic Priorities for Freight and Country Passenger*, prepared for State Rail Authority of New South Wales, BoozAllen & Hamilton Pty Ltd.
- Bureau of Industry Economics (BIE) 1983, *Structural Adjustment in the Australian Whitegoods Industry*, Research Report no. 12, AGPS Canberra.
- 1986, *Prospects for the Australian Passenger Motor Vehicle Industry under the Governments's post-1984 Assistance Plan*, Department of Industry, Technology and Commerce, Canberra.
- 1995, *Rail Freight 1995: International Benchmarking*, Report no.95/22, AGPS, Canberra.
- 1996, *Automotive Case Study: Micro Reform – Survey of Impacts on Firms*, Report 96/17, AGPS, Canberra.
- Davis, M. 1998, 'FreightCorp Coup in SA', *Australian Financial Review*, Thursday 3 December, p. 8.
- DISR (Department of Industry Science Resources) 1998, *State of the Australian Automotive Industry 1997*, AGPS, Canberra.
- 1999a, *State of the Australian Automotive Industry 1998*, AGPS, Canberra.
- 1999b, *Textiles, Clothing, Footwear and Leather Industries. Action Agendas*, Discussion Paper, March, <http://www.DISR.gov.au> (accessed 22 April 1999).
- Dunlop, I.T. 1995, 'Implementing Competition Reform – Coal Haulage by Rail: A Case Study', *Economic Papers*, vol. 14, no. 3, pp. 18–30.
- Elias, D. 1999, 'Freight Rail Getting Back on Track', *The Age*, Monday 15 February, p. 81.
- FreightCorp (various years), *Annual Report*, FreightCorp, NSW.
- Gretton, P.K. and Fisher, B. 1997, *Productivity Growth and Australian Manufacturing Industry*, Industry Commission Staff Research Paper, AGPS, Canberra.

IAC (Industries Assistance Commission) 1977, *Certain Spun Yarns and Wool Textiles and Other Goods*, Report no. 138, AGPS, Canberra.

— 1978, *Domestic Refrigerating Appliances, etc*, Report no. 160, AGPS, Canberra.

— 1980, *Textiles, Clothing and Footwear*, Report no. 240, AGPS, Canberra.

— 1981, *Passenger Motor Vehicles and Components – Post 1984 Assistance Arrangements*, Report no. 267, AGPS, Canberra.

— 1983, *Passenger and Light Commercial Vehicles – Substitution*, AGPS, Canberra.

— 1986a, *Annual Report 1985-86*, AGPS, Canberra.

— 1986b, *Textile Clothing and Footwear Industries*, Report no. 386, May, AGPS, Canberra.

IC (Industry Commission) 1991, *Rail Transport*, Report no. 13, AGPS, Canberra.

— 1995a, *Assistance to Agriculture and Manufacturing Industries*, Information Paper, AGPS, Canberra.

— 1995b, *Australian Manufacturing Industry and International Trade Data 1968-69 to 1992-93*, Information paper, AGPS, Canberra, February.

— 1996, *Competitive tendering and contracting by public sector agencies*, Report no. 48, AGPS, Canberra.

— 1997a, *Annual Report 1996-97*, AGPS, Canberra.

— 1997b, *The Automotive Industry*, Report no. 58, AGPS, Canberra.

— 1997c, *The Textile, Clothing and Footwear Industries*, Report no. 59, AGPS, Canberra.

Matthews, N. 1999, 'FreightCorp's Strategy for the New Millennium', *Daily Commercial News*, May 17, supplement pp. 9–11.

Mercer Management Consulting 1993, *Mid Term Strategic Review: Executive Summary*, prepared for State Rail Authority of New South Wales, Mercer Management Consulting Inc.

New South Wales Commission of Audit 1988, *Focus on Reform: Report on the State's Finances*, NSW Government Printer, Sydney.

PA Consulting Services 1988, *State Rail - Future Direction*, PA Consulting Services.

PC (Productivity Commission)1998a,*Annual Report 1997-98*, AGPS, Canberra.

— 1998b, *The Australian Black Coal Industry*, Inquiry Report no. 1, AusInfo, Canberra.

— 1999, *Progress in Rail Reform*, Inquiry Report, AusInfo, Canberra (forthcoming).

Rail Projects Taskforce 1999, *Revitalising Rail: The Private Sector Solution*, Department of Transport and Regional Services, Canberra.

Royal Commission into Grain Storage, Handling and Transport 1988,*Volume 3*, Supporting Paper no.6, Watson Ferguson & Co., Brisbane.

State Rail Authority of NSW (various years),*Annual Report*, State Rail Authority of New South Wales, Sydney.

TCFDA (Textile, Clothing and Footwear Development Authority) 1993,*Annual Report 1992-93*, AGPS, Canberra.

