The Automotive Industry

Volume II
Appendices

INDUSTRY COMMISSION

Report No. 58

26 May 1997

ISBN 0 642 27159 3

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Forming the Productivity Commission

The Industry Commission, the former Bureau of Industry Economics and the Economic Planning Advisory Commission have amalgamated on an administrative basis to prepare for the formation of the Productivity Commission. Legislation formally establishing the new Commission is before Parliament.

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ABBREVIATIONS

AAAA	Australian Automotive Aftermarket Association
AAI	Australian Automotive Intelligence
AAMA	American Automobile Manufacturers' Association
AATC	The Australian Automotive Technology Centre
ABARE	Australian Bureau of Agricultural and Resour ce Economics
ABS	Australian Bureau of Statistics
ACAD	Advanced Certificate in Automotive Development
ACCC	Australian Competition and Consumer Commission
ACOSS	Australian Council of Social Service
ACS	Australian Customs Service
ACTRAC	Australian Committee for Training Curriculum
ACVEN	Advisory Committee on Vehicle Emissions and Noise
ADRs	Australian Design Rules
AFMA	Australian Fleet Managers Association
AFTA	ASEAN Free Trade Agreement
AHECC	Australian Harmonised Export Commodity Classification
AIA	Automotive Industry Authority
AMF	Advanced Manufacturing Facility
AMWU	Australian Manufacturers Workers Union
ANTA	Australian National Training Authority
ANZCERTA	Australian New Zealand Closer Economic Relations Trade Agreement
ANZSIC	Australian and New Zealand Standard Industrial Classification
APEC	Asia Pacific Economic Cooperation
ARMS	Automotive Research and Marketing Services
ASIC	Australian Standard Industry Classifications

ASCO	Australian Standard Classification of Occupations
ASEAN	Association of Southeast Asian Nations
ASEM	Asia-Europe Meeting
ASIC	Australian Standard Industrial Classification
ATA	Automotive Training Australia
ATW	All terrain wagon
BERD	Business expenditure on research and development
BIE	Bureau of Industry Economics
CAST	Centre for Alloy and Solidification Technology
CBU	completely built up
cc	cubic centimetres
CEP	Certificate in Engineering Production
CES	Commonwealth Employment Service
CGE	Computable general equilibrium
CIF	cost, insurance, freight
CKD	completely knocked-down vehicle p ack
CO	Carbon Monoxide
COAG	Council of Australian Governments
COP	Conformity of Production
CPI	Consumer Price Index
CRCs	Co-operative Research Centres
CSO’s	community service obligations
CTCS	Commercial Tariff Concession Scheme
CTE	consumer tax equivalent
DEET	Department of Employment Education and Training
DEETYA	Department of Employment Education Training and Youth Affairs
DFAT	Department of Foreign Affairs and Trade

DIST	Department of Industry Science and Tourism
DPIE	Department of Primary Industrie s and Energy
DSS	Department of Social Security
EAA	Employee Assistance Australia
EBA	Enterprise Bargaining Agreement
EC	European Commission
ECE	Economic Commission for Europe
ECU	European currency unit
EDTP	Employee Development Training Program
EEC	European Economic Community
EFA	Enterprise Flexibility Agreements
EFS	Export Facilitation Scheme
EFT	Effective full time
EFTA	European Free Trade Association
EIU	Economist Intelligent Unit
EPAC	Economic Planning and Advisory Commission
EPE	Employment Placement E nterprises
ERA	effective rate of assistance
ESB	English-speaking background
ESL	English as a Second Language
ESRA	Employment Services Regulatory Authority
EU	European Union
FAFC	Australian Fleet Average Fuel Consumption
FAPM	Federation of Automotive Products Manufacturers
FBT	Fringe Benefits Tax
FCAI	Federal Chamber of Automotive Industries
FOB	free on board
FORS	Federal Office of Road Safety

FVIU	Federation of Vehicle Industry Unions
GATT	General Agreement on Tariffs and Trade
GBE	Government business enter prise
GDP	gross domestic product
GMC	General Motors Corporation
GNE	Gross national expenditure
GSE	gross subsidy equivalent
GSP	gross State product
GST	Goods and Services Tax
GTE	Goverment Trading Enterprise
HC	Hydrocarbons
HMMO	Holden’s Mechanical Manufacturing Operations
HRM	Human Resource Management
HS&E	health, safety and eduction
HVAC	Heating, Ventilating and Cooling
IAC	Industries Assistance Commission
IC	Industry Commission
IGAE	Intergovernmental Agreement on the Environment
IMVP	International Mo tor Vehicle Program
IR	Inudstrial Relations
IRC	Industrial Relations Commission
IRD	Grants for Industry Research and Development
ITABs	Industry Training Advisory Bodies
JIT	Just–In–Time
LAP	Labour adjustment package
LATA	Labour adjustment training arrangements
LCV	light commercial vehicles
LDF	landed-duty-free

LME	London Metal Exchange
LPG	Liquefied Petroleum Gas
LMP	Labour Market Programs
MAATS	Modern Australian Apprenticeship and Traineeship Scheme
MIT	Massachusetts Institute of Technology
MMAL	Mitsubishi Motors Australia Limited
MRES	MONASH regional equation system
MTAA	Motor Traders Association of Australia
MV	motor vehicle
NAFC	National Average Fuel Consumption
NAFTA	North American Free Trade Agreement
NAIRU	Non-accelerating inflation rate of unemployment
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NESB	Non-English speaking background
NIE	Newly Industrialised Economies
NIS	Newly Independent States of the former Soviet Union
NO_2	nitrogen dioxide
Nox	Nitrogen
NRA	nominal rate of assistance
NRTC	National Road Transport Commission
NSWEPA	The New South Wales Environment Protection Authority
NVETS	National Vocational Education and Training System
NWGs	Natural Work Groups
NZACMF	New Zealand Automotive Component Manufacturers' Federation
OBD	on-board diagnostics
OE	original equipment
OECD	Organisation for Economic Cooperation and Development

OH&S	occupational health and safety
Pb	lead
PMV	passenger motor vehicles
ppm	parts per million
PU	Pick-up
RAASA	Royal Automobile Association of South Australia
R&D	research and development
RBA	Reserve Bank of Australia
SACES	South Australian Centre for Economic Studies
SACFM	South Australian Centre for Manufacturing
SADC	South Australian Development Council
SCM	Agreement on Subsidies and Countervailing Measures
SCPs	special component suppliers
SO_2	sulphur dioxide
TCF	textiles, clothing and footwear
TCS	Tariff Concessions System
TFIs	Test Facility Inspections
TFP	Total factor productivity
TMC	Toyota Motor Corporation
TPS	Toyota Production System
TRIMS	Trade-Related Investment Measures
UAW	United Auto Workers Union
UNECE	United Nations Economic Commission for Europe
USTR	United States Trade Representative
VAT	Value Added Tax
VET	vocational education and training
VFI	vertical fiscal imbalance
VIC	Vehicle Industry Certificate

WST	Wholesale Sales Tax
WTO	World Trade Organization

TERMS OF REFERENCE

I, PETER COSTELLO, Treasurer, under Part 2 of the Industry Commission Act 1989, hereby:

1. refer Australia's automotive industry for inquiry and report within nine months of receiving this reference. The inquiry will cover the passenger and light commercial vehicle sectors and the component sector including both original and aftermarket components;
2. specify that in making its recommendations on assistance arrangements for the automotive industry from January 2000, the Commission aim to improve the overall economic performance of the Australian economy;
3. request that the Commission have regard to the Government's desire to encourage the development of a sustainable, prosperous and internationally competitive automotive manufacturing industry in Australia; to improve the overall economic performance of the Australian automotive industry; to provide good quality, competitively priced vehicles to the Australian consumer; and its commitment to abide by Australia's international obligations and commitments;
4. specify that the report include options, including a preferred option, and implementation strategy, and the Commission consider how the Australian automotive industry will evolve within a world trading environment through the next decade, and that the Commission consider APEC developments on market liberalisation, and the timing and extent of cost reductions from other microeconomic reforms;
5. request that the Commission report on:
   - (a) emerging national and international market factors affecting the industry, including its current structure, rationalisation, competitiveness and barriers facing Australian exports, drawing international comparisons where appropriate;
   - (b) the advantages and disadvantages of Australia as an investment location for all phases of automotive activity, from research and development to manufacturing and export;
   - (c) the potential for further development of the industry, including the scope for improving productivity and workplace practices;
   - (d) an appropriate policy framework to address the environmental issues facing the industry, including meeting fuel efficiency and emissions targets;
   - (e) the effectiveness of Australian research and educational infrastructure in providing design, engineering and other skill capabilities;
   - (f) the impact of current assistance arrangements for the industry, and regulatory and standards of arrangements, on its structure, performance and competitiveness, and on Australian consumers, resource allocation and growth prospects generally;
   - (g) any measures which could be undertaken to remove impediments or otherwise contribute to the efficiency and development of the industry, including ways of reducing the regulatory burden on small business; and
   - (h) the impact of its proposals on relative assistance between the vehicle manufacturing and the component manufacturing sector; and
6. specify that the Commission take account of any recent substantive studies, and have regard to the economic, social, environmental and regional development objectives of governments.

PETER COSTELLO

4 August 1996

A CONDUCT OF THE INQUIRY

A.1 Introduction

This Appendix outlines the inquiry process and the organisations and individuals that participated in the inquiry.

On 12 August 1996 the Commission received the terms of reference for this inquiry into the Australian automotive industry. The reference directed the Commission to report within nine months on assistance arrangements for the automotive industry from January 2000. The reference also asked the Commission to report on a number of other matters, including the potential for further development of the industry, and measures which could be undertaken to remove impediments or otherwise contribute to the industry's efficiency. The full terms of reference are reproduced on page XVIII.

Following receipt of the terms of reference, the Commission placed a notice in the national press inviting public participation in the inquiry and released an issues paper to assist participants in preparing their submissions. The Commission received 92 submissions prior to the draft report, and an additional 114 submissions following the draft report. A list of the parties that made submissions is provided in Section A.2.

The Commission also held informal discussions with organisations, companies and individuals to gain background information and to assist in setting an agenda for the inquiry. Those visited by the Commission are listed in Section A.3.

The trade union movement declined the personal offer made by the Chairman of the Commission to be involved in the inquiry.

Due to inquiry time constraints, the Commissioners convened a number of round table discussions, rather than holding public hearings to gather information for the draft report. These discussions enabled the Commissioners to exchange views with small groups of key industry members on major issues. A transcript of the round tables was kept and made publicly available to maintain the transparency of the Commission's processes. Round table participants are listed in Section A.4.

The Commission held public hearings in Sydney, Melbourne and Adelaide in late February and early March 1997, and received evidence from 54 organisations. A list of the parties that gave evidence at the public hearings is provided in Section A.5. A transcript of the public hearings was made publicly available.

The Commission engaged the Centre of Policy Studies/Impact project at Monash University to assist it in modelling the economic effects of past and future developments in the automotive industry. No other consultants were engaged.

The Treasurer agreed to a two week extension of the reporting date for the inquiry to 26 May 1997, following a request by the Commission's Chairman, Mr Bill Scales. At that time the Commission was still waiting on the results of three separate modelling studies of the effects of proposed automotive industry tariff reductions. Given the high profile that some participants had placed on economic modelling, and given the late delivery of the studies, extra time was needed to thoroughly evaluate the various models.

A.2 Submissions received

Participant	*Submission No.*
Access Economics Pty Ltd	201
Adelaide Hills Toyota	21
Aiken, C	160
Air International Group Ltd	37
Aircar Industry	123
Albon, R	179
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A.3 Visits

Australian Capital Territory

Australian Customs Service

Commonwealth Department of Environment, Sports and Territories

Commonwealth Department of Foreign Affairs and Trade

Commonwealth Department of Primary Industries and Energy

Federal Chamber of Automotive Industries

Federal Office of Road Safety

Federation of Automotive Product Manufacturers

Motor Trades Association of Australia

South Australia

Arrowcrest Group Pty Ltd (ROH)

Bridgestone Australia Ltd

Britax Rainsfords Pty Ltd

City of Elizabeth

City of Hindmarsh and Woodville

City of Marion

City of Mitcham

City of Noarlunga

General Motors - Holden’s Automotive Ltd

Lear Seating Australia Pty Ltd

Mitsubishi Motors Australia Ltd

Monroe Australia Pty Ltd

South Australian Government

Southern Development Board Adelaide

Southern Region of Councils Inc

Victoria

Automotive Components Limited

Air International Group Ltd

Australian Chamber of Manufactures

BHP Steel

BTR Automotive Engineering Group

Denso Manufacturing Australia Pty Ltd

Everco Wiring Systems

Ford Motor Company of Australia Ltd

General Motors - Holden’s Automotive Ltd

Hella Australia Pty Ltd

Henderson’s Automotive Group

Mazda Australia Pty Limited

Melba Kawashima Pty Ltd

Nissan Australia Pty Ltd

PBR Automotive Pty Ltd

Pilkington (Australia) Ltd - Automotive Division

Robert Bosch (Australia) Pty Ltd

Toyota Motor Corporation Australia Ltd

VDO Instruments Australia Pty Ltd

Victorian Government

New South Wales

Bishop, A. E. & Associates Pty Ltd

Daewoo Automotive Australia Pty Ltd

Disc Brakes Australia

Harrington, G A & L Pty Ltd

Inchcape Motors Australia

Volvo Car Australia Pty Ltd

A.4 Round table participants

Round table 1: Adelaide, 30 September 1996

Britax Rainsfords Pty Ltd

Castalloy Ltd

Federal Chamber of Automotive Industries

Federation of Automotive Products Manufacturers

General Motors - Holden's Automotive Ltd

Lear Seating Australia Pty Ltd

Mitsubishi Motors Australia Ltd

Monroe Australia Pty Ltd

Round table 2: Sydney, 1 October 1996

BMW Australia Ltd

Federal Chamber of Automotive Industries

Honda Australia Pty Ltd

Hyundai Automotive Distributors

Kia and Asia Motors (Australia) Pty Ltd

Mazda Australia Pty Ltd

Mercedes-Benz (Australia) Pty Ltd

Nissan Motor Company (Australia) Ltd

Rover Australia Pty Ltd

Round table 3: Melbourne, 9 October 1996

Air International Group Ltd

Automotive Components Ltd

Federal Chamber of Automotive Industries

Federation of Automotive Products Manufacturers

Ford Motor Company of Australia Ltd

Toyota Motor Corporation Australia Ltd

Victorian Automotive Chamber of Commerce

Round table 4: Melbourne, 10 October 1996

Australian Automobile Association

Australian Automotive Intelligence

Australian Consumers Association

Federal Chamber of Automotive Industries

Federal Office of Road Safety

Federation of Automotive Products Manufacturers

NRMA Limited

Royal Automobile Club of Victoria Ltd

Round table 5: Melbourne, 10 October 1996

Advanced Engineering Centre for Manufacturing

Automotive Training Australia

Deakin University

John Batman College of TAFE

Society of Automotive Engineers Australasia

Technisearch - RMIT

Round table 6: Melbourne, 14 October 1996

Australian Automotive Aftermarket Association

Australian Automotive Export Group

Australian Tyre Manufacturers' Association

BTR Engineering (Australia) Ltd

Denso Manufacturing Australia Pty Ltd

Everco Wiring Systems

Hella Australia Pty Ltd

Henderson's Automotive Group

Johnson Matthey Ltd

PBR Automotive Pty Ltd

Robert Bosch (Australia) Pty Ltd

VDO Instruments Australia Pty Ltd

A.5 Public hearing participants

Aiken, C

Aircar Industry

AME Systems Pty Ltd

Association of Motoring Clubs in Victoria

Australian Automobile Association

Australian Chamber of Manufactures

Australian Tyre Manufacturers’ Association

Bridgestone Australia Ltd

BTR Automotive Engineering Group

Caldecott, J

Calum Australia Pty Ltd

City of Greater Geelong

City of Marion

Cutbush-Sabine, Professor

Dier, K

Engineering Employers Association, South Australia

Federation of Automotive Products Manufacturers

Ford Motor Company of Australia Ltd

Gallus, C, MHR, Member for Hindmarsh

Geelong Chamber of Commerce

General Motors - Holden’s Automotive Ltd

Johnson Matthey Ltd

Lear Corporation Australia Pty Ltd

Marplex Australia Ltd

Mitsubishi Motors Australia Ltd

National Consolidated Ltd

New Zealand Automotive Component Manufacturers’ Federation

Nissan Motor Company (Australia) Pty Ltd

NRMA Ltd

Pacific BBA Ltd

Parry, R

PBR Automotive

People for Ecologically Sustainable Transport

Performance Industries

Pilkington (Australia) Limited

PolyPacific Pty Ltd

Precise Tooling Australia

Robert Bosch (Australia) Pty Ltd

Royal Automobile Association of South Australia Inc.

Society for Balanced Trade Inc.

Society of Automotive Engineers - Australasia

South Australian Development Council

South Australian Employers’ Chamber of Commerce and Industry Inc.

South Australian Government

South Pacific Tyres

Southcott, A, MHR, Member for Boothby

Southern Development Board Adelaide

Southern Region of Councils Inc.

Suzuki Motor Corporation

Thomas, J

Thomson, K, MHR, Member for Wills

Toyota Motor Corporation Australia Ltd

Victorian ALP

Wyatt and Associates

B THE INTERNATIONAL AUTOMOTIVE INDUSTRY

B.1 Introduction

The automotive industry is a prominent industry in many developed countries, including Australia. More recently, it has emerged as a manufacturing industry in developing countries such as Mexico, China, South Korea, and Malaysia. Other countries, such as Indonesia, are developing their automotive manufacturing capability as a national priority. The industry now exists in some form in numerous locations.

The automotive industry is increasingly a global industry. It operates via sophisticated intra-firm and intra-industry linkages and no part of the industry can be viewed in isolation. For example, The Ford Motor Company has manufacturing facilities in 30 countries on six continents.

B.2 Worldwide vehicle production and sales

Japan, Western Europe and the United States are the largest producers of PMVs and components. They are also the largest consumers of automotive products. By comparison, Australia represents less than 1 per cent of world automotive production and consumption.

Newly industrialised economies (NIEs) have recently emerged as significant players in the international automotive industry. Some of these countries now have considerable manufacturing capacity and many generate significant sales (see Tables B.1 and B.2). Other countries such as Poland, the Czech Republic and Slovakia have longstanding automotive industries which are emerging from nationalisation in the wake of political change.

Many of these emerging automotive producers are benefiting from decisions by multinational companies to relocate part of their production. For example, Mexico and Brazil have plants that are owned by Ford, General Motors and Chrysler. Other emerging nations are developing their industries with an emphasis on local ownership, creating new companies. As noted above, the emergence of the industry in eastern Europe is largely the transformation from existing nationalised industries to a more competitive, open industry.

The mix of relocation of some manufacturing by established firms and the development of emerging automotive companies is cultivating a highly competitive international industry.

B.2.1 Vehicle production

The level of world motor vehicle production was essentially unchanged over the period 1991 to 1995. Production of PMVs totalled 33.9 million in 1995. Japan and the United States accounted for around 41 per cent of world production. Germany, France, Korea, Spain and the United Kingdom are also major producers. The Economist Intelligence Unit (EIU 1997) estimated that world vehicle production in 1996 would increase to approximately 35 million units.

Changes in world component production and sales figures are sensitive to changes in vehicle production and sales. The value of world component production was about US $500 billion in 1995 (EIU 1996a).

Growth in production between 1985 and 1995 has been largely from emerging operations in NIEs such as Mexico, Brazil and Malaysia — reflecting relocation of production by established firms and emerging operations by new entrants to the industry.

Considerable change in European production levels can be explained by firms relocating production. For example the automotive industry in Spain, which has no domestically owned vehicle producers, has increased as multinational firms such as General Motors and Volkswagen have relocated production there. Firms have also relocated to Eastern Europe as the emerging General Motors operation in Poland demonstrates. Research by the OECD indicates that the relocation of production between countries is partly explained by vehicle producers pursuing lower costs and market access (OECD 1996a).

Production relocation decisions have also had important impacts in North America. Falling production in Japan over the 1990s has, in part, been a result of production shifting to North America and to a lesser extent Europe and Asia. The OECD expects this trend to continue.

> Production in Japan is expected to hold steady or decline slightly in the years to come and the production from Japanese-owned 'transplant' operations to grow. (OECD 1996a, p. 11)

Table B.1: **International passenger motor vehicle production by country, 1985 and 1991 to 1996**

Country	*1985 (‘000s)*	*1991 (‘000s)*	*1992 (‘000s)*	*1993 (‘000s)*	*1994 (‘000s)*	*1995 (‘000s)*	*1996[a] (‘000s)*
Japan	7 646	9 753	9 378	8 497	7 801	7 612	7 820
USA	8 186	5 439	5 659	5 988	6 606	6 333	6 053
Germany[b]	4 167	4 677	4 864	3 753	4 094	4 362	4 423
France	2 632	3 188	3 329	2 836	3 175	3 051	3 075
Korea[c]	264	1 158	1 307	1 593	1 758	2 003	2 260
Spain	1 230	1 774	1 791	1 506	1 822	1 959	1 859
UK	1 048	1 237	1 292	1 376	1 467	1 532	1 602
Italy	1 389	1 633	1 477	1 117	1 341	1 422	1 380
Canada	1 078	1 060	1 034	1 349	1 211	1 337	1 305
Brazil	759	704	819	1 099	1 216	1 303	1 460
Mexico	297	720	776	835	856	698	810
India	129	209	192	244	298	391	470
Poland	283	167	219	334	338	364	380
China	5	81	163	230	250	321	380
Australia	**384**	**278**	**259**	**296**	**323**	**310**	**490**
Czech[d]	na	173	202	223	180	217	285
Malaysia	na	88	105	103	130	140	250
Indonesia	na	47	30	32	44	50	32
Other		1 164	659	1 207	659	520	667
Total		**33 550**	**33 555**	**32 618**	**33 569**	**33 925**	**35 000**

na data unavailable.
a Estimates.
b Including former East Germany from 1991.
c The Peoples Republic of South Korea.
d The Czech Republic and Slovakia.
Source: EIU (1997 and 1996b).

The ability of new entrants to develop production capacity is demonstrated by other countries such as South Korea and Malaysia. From negligible levels of production in 1985, South Korea has become the fifth largest producing nation (see Table B.1). Other examples of emerging production capacity exist in Eastern Europe, where political changes have created opportunities for multinational firms to establish new facilities.

This international effort to increase production — by new firms entering the industry and established firms producing where costs are lowest — has resulted in considerable excess capacity. Yet production is only one side of the international industry and the presence of excess capacity is not a recent phenomenon. It has persisted since before the emergence of Korean vehicle producers. The Power Report observed:

> ... North America has three to four million units of surplus vehicle supply ..., Japan is probably at the same level and Europe may have five or six million units of excess capacity. (Keller, Power Report, July 1996, p. 14.)

B.2.2 Vehicle sales

For much of recent history, while producers have been increasing capacity, the level of demand in the total world motor vehicle market has been essentially unchanged. In particular, many of the emerging producers have been expanding during a period when there has been no obvious market for their products. The Power Report commented:

> ...Korea is adding millions of units of capacity. European and American auto companies and even the Japanese wonder who is going to buy all of these vehicles (Keller, Power Report, July 1996, p. 14).

World vehicle demand — as measured by registrations — was relatively stable between 1991 and 1995 (see Table B.2). However, the EIU estimated that demand increased about 4 per cent from 1995 to 1996.

While demand has been unchanged recently, it has fluctuated over the longer term. Certain markets have expanded while others contracted. While registrations in the United States fluctuated, they declined by 22 per cent from 1985 to 1996. Canada and Italy also experienced declining registrations. However, the United Kingdom, Spain, Japan and Germany experienced a modest increase in registrations for the period — about ten per cent. Registrations in Australia decreased significantly from 1985 to 1987, but have been increasing since, except for a decrease associated with economic recession in 1991.

The greatest change over the last decade has been the increase in demand for motor vehicles in NIEs. While this growth has been from relatively low levels, registrations in South Korea, China and Brazil have more than doubled over this time (see Table B.2).

This increase in registrations in NIEs requires qualification. The type of vehicle demanded within these countries differs considerably depending on needs and consumer tastes. Indonesia and China have had relatively high registrations of light commercial vehicles as their economies have expanded. Accordingly, their local automotive industry — at this stage focussed on importing vehicles — has concentrated on meeting this segment of demand.

Table B.2: **International passenger motor vehicle registrations by country, 1985 and 1991 to 1996[a]**

Country	*1985 (‘000s)*	*1991 (‘000s)*	*1992 (‘000s)*	*1993 (‘000s)*	*1994 (‘000s)*	*1995 (‘000s)*	*1996 (‘000s)*
Japan	3 104	4 868	4 454	4 199	4 210	4 444	4 640
USA	11 046	8 176	8 211	8 518	8 992	8 636	8 570
Germany[b]	2 379	4 159	3 930	3 194	3 209	3 314	3 510
France	1 767	2 031	2 106	1 721	1 973	1 931	2 132
Korea[c]	136	773	876	1 037	1 140	1 149	1 220
Spain	544	887	980	745	910	834	920
UK	1 832	1 592	1 594	1 778	1 911	1 945	2 025
Canada	1 146	883	798	739	748	672	645
Italy	1 746	2 341	2 375	1 693	1 672	1 704	1 690
Brazil	599	577	602	940	1 139	1 445	1 450
Australia	**500**	**388**	**402**	**414**	**461**	**488**	**492**
China	na	121	160	225	245	321	380
Poland	na	na	203	239	250	264	380
India	124	206	204	244	282	393	n/a
Czech[d]	na	141	225	111	110	137	222
Malaysia	na	122	110	121	137	149	270
Mexico	242	392	445	399	414	116	185
Indonesia	na	46	30	33	43	48	40
Other		5 704	5 765	6 126	5 704	5 862	28 771[e]
Total		**33 407**	**33 470**	**32 476**	**33 550**	**33 852**	**35 239**

na data unavailable.
a EIU estimates of sales, VFACTS figures for Australia.
b Including former East Germany from 1991.
c The Republic of South Korea.
d The Czech Republic and Slovakia.
e includes India.
Source: EIU (1997 and 1996b).

Although total demand for vehicles is forecast to increase between now and the next century, this too will vary according to whether the markets are established or emerging. Future demand for vehicles in the major developed nations’ markets is expected to expand moderately with population until 2000. NIEs are expected to account for just less than half of the worlds’ forecast demand growth until the year 2000 (EIU 1995). Overall, world sales of PMVs are expected to increase modestly, stabilising at around 37 million units by the turn of the century (EIU 1996b).

It is widely accepted that the established markets of the United States, Japan and Europe are mature. Consequently, demand in these countries is dependant largely on general economic conditions, underpinned only by vehicle stock replacement (EIU 1995). The NIEs, while growing rapidly, presently account for small total numbers of vehicles. On balance, the demand from the OECD nations will continue to be the larger fraction of world registrations for the foreseeable future (EIU 1994).

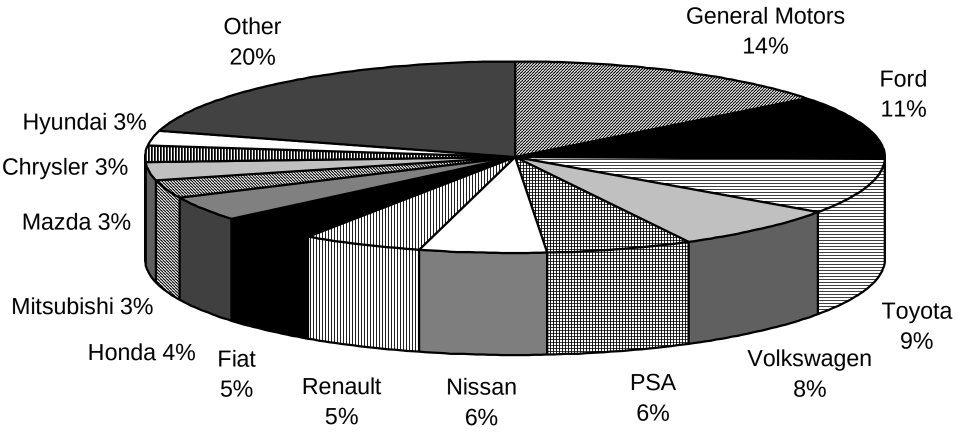
B.3 Automotive industry structure, trade and investment

The OECD estimated that the twenty largest vehicle manufacturers now account for more than 90 per cent of the market, a slight increase from about 85 per cent in the early 1980s (OECD 1996a). The top twelve firms — all based in the US, Japan and Western Europe — account for 80 per cent of production (see Figure B.1).

The component sector is less concentrated than vehicle manufacturing. However, the largest 60 component firms account for around half of world component market turnover (EIU 1996a).

Significant vertical integration between vehicle and component manufacturers is characteristic of the automotive industry. The Economist Intelligence Unit (1994) reported that General Motors in the United States was approximately 70 per cent vertically integrated at that time. Japanese and German vehicle manufacturers also exhibit close relationships with suppliers (EIU 1994). However, they rely less on component suppliers wholly-owned by the vehicle producer itself.

Figure B.1: **World market share for PMVs by company, 1994**



Source: AAMA (1996).

Many of the largest component companies in the world are wholly owned subsidiaries of one of the large vehicle manufacturers. For example Delphi Automotive, the largest global component firm with annual sales of over $26 billion, is owned by General Motors. Other component firms may be partially owned by vehicle manufacturers, have cross holdings with vehicle producers or have formed a strategic alliance. For example, Japanese vehicle manufacturers have historically had structured relationships with component suppliers under the *keiretsu*.

Defining what constitutes vertical control of suppliers is problematic. Because of this, it is difficult to discern a trend towards decreasing or increasing integration in the industry. There has been increased contracting out by many of the manufacturers, and the transferring of in-house component production to stand alone wholly owned component companies. There have also been closer relationships formed between component suppliers and the vehicle manufactures to improve design, quality and cost.

As part of their global strategy many vehicle and component manufacturers have developed production facilities in a number of locations (see Attachment B1). The OECD (1996a) reported that the ten largest car manufacturers each had more than ten per cent of their production diversified across foreign locations. Nearly two thirds of Ford's, half of General Motors' and about a third of Honda's, Volkswagen's and Volvo's production is not in the company's country of origin. As noted in section B.2.1, this is partly driven by cost differentials across locations. Other factors, such as market access, political stability and government assistance also affect their decisions. This trend, driven by the search for lower cost production and improved access to new markets, is discussed in more detail in section B.3.1.

Component manufacturing is also an increasingly global business. Car manufacturers who make their own components are looking to produce at lower costs regardless of location. For example, Ford Australia powertrain operations make aluminium transmission cases exported to France and 4 cylinder iron blocks exported to Mazda Japan. Other car manufacturers are sourcing their component inputs more widely. Where it is conducive to just-in-time production practices, many alternate component suppliers can help insulate vehicle manufacturers from currency variations and can assist in gaining market access.

Another trend, driven by just-in-time production methods as well as other considerations, is the location by component manufacturers close to the final users of their components. For example, Volkswagen, the largest foreign assembler in China, has assisted many of its European component suppliers to set up plants in China (EIU 1994). Japanese vehicle manufacturers have also actively encouraged their suppliers to form joint ventures in China in order to facilitate assembly operations in the future (EIU 1996a):

> Growing encouragement from major Japanese car makers such as Toyota and Nissan, eager to promote their own future roles in China, has also helped spur this change of policy [component firms relocating production]. (The Economist 1996, p. 31)

Some car manufacturers are also looking to reduce the number of component suppliers they deal with. For example, Ford's global goal is to halve the number of its first tier suppliers by 2000 (EIU 1996a). In particular the development of global platforms requires the ready availability of components for the platform throughout the world. Obviously, suppliers who can supply a quality product, cheaply, anywhere in the world will be at an advantage.

B.3.1 Automobile industry trade

Reliable data on international trade in the automotive industry is difficult to obtain. This is exacerbated by the constantly changing organisation of the global industry. However, reasonably timely data for the OECD is available and that is presented here, as automotive trade is concentrated in the OECD group of nations.

The OECD group of countries account for over 98 per cent of world exports and around 95 per cent of world imports of motor vehicles (OECD 1995a). Total OECD PMV trade was valued at US$171.6 billion in 1993, parts and accessories accounted for another US$82.7 billion. Table B.3 presents inter and intra regional trade data for the OECD for the years 1980 and 1992. As production of motor vehicles increases in NIEs, exports from those countries are also increasing and the pattern of automotive industry trade is likely to change (OECD 1996a).

The automotive industry exhibits significant regional trade. Within the OECD group of nations, trade between members of regional trade arrangements such as the European Union (EU) and the North American Free Trade Agreement (NAFTA) is significant. Over two thirds of EU exports are to other EU member countries. In the North American region almost all Canada's exports went to the USA and just under half of US exports went to Canada (OECD 1996a). The OECD noted the importance of regional trade arrangements to the global automotive industry.

> Regional trade arrangements have promoted regional patterns of production and consumption. All OECD countries, except Japan, are members of regional trade arrangements providing participating countries with duty-free access for automobiles and auto parts, along with other advantages ... These arrangements contribute to the

relatively high level of intra-regional trade in automobiles and auto parts. (OECD 1996a, p. 6)

Table B.3: **Exports of finished products, OECD regions, 1980 and 1992**

Reporting region	*Year*	*Nth America*	*Europe*	*East Asia*	*Rest of the world*	*Total*
Nth America	1980	83.9	2.8	1.2	12.1	100
	1992	75.5	7.0	8.6	8.9	100
Europe	1980	15.5	72.3	2.0	10.2	100
	1992	6.4	81.2	5.3	7.1	100
East Asia	1980	55.8	20.3	5.5	18.3	100
	1992	48.2	28.0	5.6	18.2	100
Rest of the world	1980	0.3	41.0	1.7	57.0	100
	1992	10.7	18.6	5.7	65.0	100
Total	**1980**	**35.9**	**48.1**	**2.8**	**13.1**	100
	1992	**29.6**	**53.3**	**5.9**	**11.1**	100

Source: OECD (1995a, unpublished data).

The patterns of regional trade amongst automotive manufacturers in turn influences the pattern of trade within the component sector. Rapid growth of trade in automotive components has accompanied rapid growth in trade of completely built up vehicles. However, the incentives for trade in components may differ from those affecting trade in vehicles. For example, components generally face lower tariffs than CBU vehicles and duty free arrangements often apply within regional trade blocs to both cars and components.

> ... regional producers [generally] have an incentive to source inputs within the region to qualify for duty-free treatment. (OECD 1996a, p. 6)

Regional trade is also influenced significantly by emerging producers. For example, in the development phase of a countries' automotive industry, that country is likely to have substantial imports, but limited capacity to export. At this stage, exports of parts and accessories from established operations — often in OECD countries — to developing nations greatly exceed imports from those nations. A significant part of this trade in some NIEs is due to importing large volumes of components to support fledgling assembly operations.

However, as those countries wishing to establish an automotive industry often impose staged local content restrictions, imported components tend to be replaced by local production. Local suppliers, often in joint ventures with global component suppliers wanting to retain market access, develop alongside the new plants (OECD 1996a). Consequently regional patterns of trade are likely to continue to change.

Another important aspect of trade within the automotive industry is trade within firms — intra-firm trade. With the industry dominated by multinational firms, production facilities for both vehicles and components are located around the globe. With increased global sourcing these firms are transporting CBU vehicles and components to where they are required within the firm's global operations. Holden provided an example of this:

> Manufacturers will tend to locate their car manufacturing plants close to the largest markets — which automatically results in reciprocal trade. Holden will probably source a major car line from the planned new plant in Thailand [the Astra small car], while simultaneously supplying the Thai market's Vectra requirements from Australia. Somewhat smaller markets are likely to attract component manufacturing plants, which will operate on a large scale and export most of their production. The same country will import built up cars. (sub. 19, p. 10)

Many of these arrangements constitute intra-firm trade — within the one multinational parent organisation. An example of intra-firm trade is Mitsubishi importing the Mitsubishi Lancer and four cylinder engines into Australia from it's parent company in Japan, while at the same time supplying the US market with the Diamante, a six cylinder medium sized sedan.

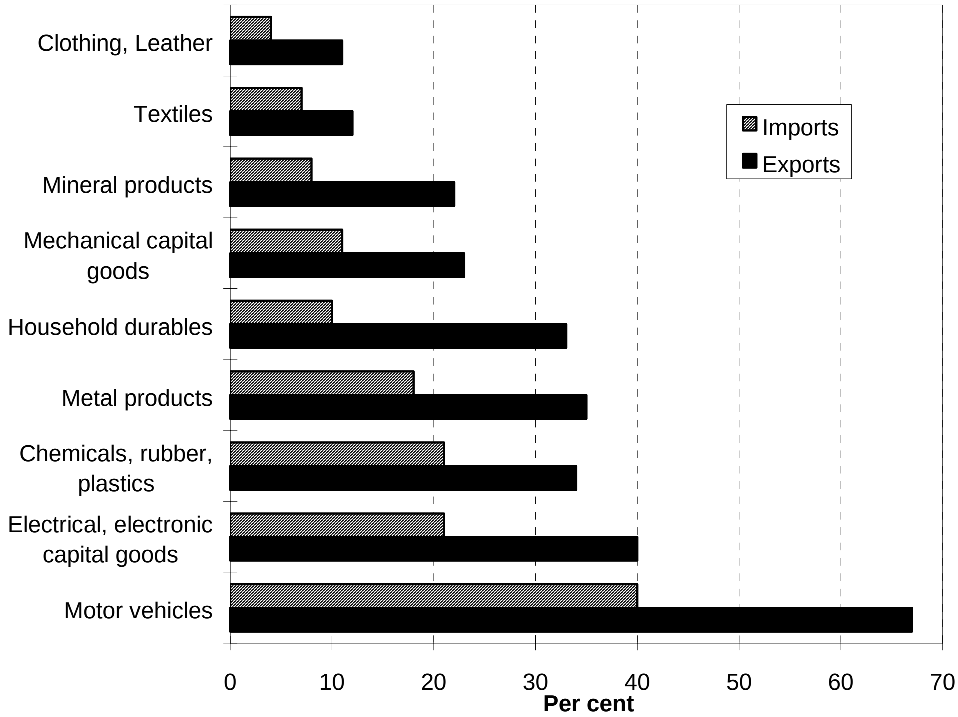
Intra-firm trade is difficult to define however. In certain instances firms may import vehicles from other manufacturers in which they hold equity. As such, a fraction of that trade is intra-firm and the remainder is inter-firm. An example of this is Ford importing the Festiva from Kia Motors in Korea, a company in which Ford Motor Company worldwide has equity.

Nonetheless, as measured by the OECD, intra-firm trade within the automotive industry is substantially above the average for all manufacturing industries and appears to be increasing. In a globalisation study, the OECD (1995b) found that:

> ... the most intensive intra-[firm] trade concerns activities which are mainly controlled by the normal type of multinationals who market their products on a continental and usually on a world scale.
>
> With rates for intra-[firm] trade of 40 per cent on the import side and 67 per cent on the export side, the automobile industry has made the greater progress in globalisation as defined by the study. (OECD 1995b, p. 14)

Figure B.2 presents figures showing the percentage of firms' trade that is received from or sent to other affiliates around the world for various industries.

Figure B.2: **Firm export and import trade — intra-firm share**



Source: OECD (1995b).

B.3.2 Foreign direct investment and strategic alliances

Trade in vehicles and automotive components is one consequence of the global nature of the automotive industry. Another consequence of globalisation is the pattern of investment seen in the industry. In one sense the patterns of foreign direct investment and of trade can be seen as two sides of the same coin — a firm might choose to trade amongst regions or alternately it might choose to invest in regions.

However, trade and direct investment should not be viewed as alternatives. For example, Ford are both a direct investor in the automotive industry in Australia and also a major importer of small vehicles. As described in Chapter 3, Ford is the second largest PMV importer into Australia.

Firms' decisions concerning trade and investment are also affected by the policies of governments. This point was made by the OECD:

> ... interrelation between trade and investment policies affect automobile investment decisions, ... corporate organisational structures and informal domestic content requirements. (OECD 1996a, p. 23)

American companies, which expanded internationally at a time of high barriers to trade, have significant offshore production facilities. Many of these facilities were established to allow those firms to get behind countries' tariff walls. The location of both Ford and Holden in Australia is an example of this strategy. By contrast, Japan's automotive industry expanded considerably during the 1970s at a time of a benign world trade environment and, until the mid 1980s, chose to export (trade) from the home country rather than invest in offshore production. As trade barriers were raised to Japanese imports (through Voluntary Export Restraints), Japanese importers began to build production facilities overseas.

Current tariff and non-tariff barriers to trade exist in many developing markets and firms' decisions can be biased towards foreign direct investment in these markets. Most established markets are less distorted and trade in automotive vehicles and parts is a major part of these markets. As noted in section B.3.1 the patterns of trade and investment are likely to change over time.

> Among non OECD countries, import substitution strategy may continue to be pursued ... In contrast, investment in the automobile and auto parts industry in OECD countries is less distorted by trade obstacles ... investment is more [influenced] by its intrinsic viability. (OECD 1996a, p. 23)

At the same time as investing off-shore, firms are also globalising via equity holdings, joint ventures and licensing agreements (see Attachment B1). Many established smaller firms have been acquired by the larger car manufacturing firms. For example, GM recently purchased 50 per cent of Saab, and BMW owns Rover. As a result, automotive industry concentration has increased.

Joint ventures between multinational and local firms are most prolific in Asia and Eastern Europe. For example, in the Czech Republic, Volkswagen has been investing in the previously nationalised Skoda operations since 1991. Similarly, the Karosa operation is now ensconced in the global operations of Renault, and Avia has been majority owned by a consortium of Daewoo and Steyr–Daimler–Puch since 1995.

In Asia, Governments' domestic policies encouraging the development of local assembly operations, while imposing barriers to automotive imports, encourage joint ventures with local firms. In Eastern Europe, joint ventures have often been the most effective way to enter these markets quickly and establish a strategic presence for future growth.

> International mergers and acquisitions, joint venture and other equity operations proliferated at the end of the 1980s as part of the high level of international investment in the industry. Heightened activity was due to:
>
> - take-overs and joint ventures with uncompetitive auto operations in Eastern Europe;
> - prospects for expansion in South-East and East Asia. (OECD 1995a, p. 27)

It is a difficult task, therefore, to predict the structure of the automotive industry at any point in time. Patterns of trade, investment and whether activity takes place between firms or within the one organisation are susceptible to many influences. Government policy is an obvious variable, but it is simplistic to think that it operates in isolation. The global automotive industry is indeed complex. On-going global strategies are likely to be a product of many influences, and the strength of any one is likely to change through time.

B.3.3 Market allocation and production decisions

Due to the global nature of the automotive industry, firms, their affiliates and transplant operations frequently operate within a single overall strategic plan. A fundamental element of this overall strategy is the careful allocation of production responsibilities and markets to maximise the total benefits for the multinational parent. As the establishment or upgrading of an automotive manufacturing facility generally requires considerable capital resources, markets are allocated carefully.

For such relatively large outlays, multinational companies are keen to ensure that individual plants have the required market to make the investment cost-effective. Typically the parent organisation designates a given market — geographical and/or model segment — to be supplied by a designated plant.

This process has two major benefits for the parent firm. First, this ensures affiliates don’t compete in the same market. Consequently resources are less likely to be devoted to unsuccessful commercial operations. Secondly, the fact that all the company’s operations compete for capital within the global firm drives competition between alternate operations. In turn this encourages individual plants to constantly reassess opportunities for reducing costs and improving their performance relative to the international benchmark for best practice.

As a consequence of this global process, facilities across the world are constantly competing to gain access to markets and looking to produce as efficiently as they can. As part of this process, Australia’s PMV manufacturing operations compete with other affiliates throughout the world for parent company investment. Where a manufacturer has a number of options to supply a market with a particular model, the infrequent opportunity to compete for that market within the firm arises — usually in conjunction with major investment decisions which are made in a global production and marketing context.

B.4 Summary

As noted by many participants to this inquiry, the past decade has seen substantial change in the international automotive industry. The vehicle manufacturing industry has been under competitive pressure and in turn that pressure has been passed on to the many component manufacturers and service sectors that rely on the manufacture of vehicles.

ATTACHMENT B1
GLOBALISATION IN THE AUTOMOTIVE INDUSTRY: FORD, GENERAL MOTORS, MITSUBISHI AND TOYOTA.

This attachment describes the global operations of the four automotive companies that produce vehicles in Australia.

Ford Motor Company (United States)

AC CARS	Ford supplies components to AC.
ASTON MARTIN	Wholly owned subsidiary.
BMW	Malaysia's Associated Motor Industries Sdn. Bhd., is 30% owned by Ford. It assembles Ford, BMW, Rover and Suzuki vehicles.
CHRYSLER	GM, Ford and Chrysler have several co-research projects under the direction of USCAR.
FIAT	Ford and Fiat's U.K. truckmaking and distribution subsidiaries are merged into a joint venture, Iveco Ford Truck Ltd. Each company owns 48%. Fiat holds 80% and Ford holds 20% of New Holland n.v. (formerly N.H. Geotech). Fiat supplies cylinder heads to Ford in North America.
GENERAL MOTORS	Ford and GM own a stake in Budget Rent-A-Car Systems in Australia.
JAGUAR	Wholly owned subsidiary.
KIA	Ford holds 16.9% equity in the South Korean automaker; 8% is held by Ford-affiliate Mazda Motor Corp.
MAZDA	Ford owns 33.4% of Mazda. Ford and Mazda each hold 45.1% equity in Autorama Inc., the exclusive marketer of Ford products in Japan. Ford is supplying engine blocks made in Australia to Mazda in Japan.

NISSAN	Ford and Nissan supply each other with commercial vehicles in Australia.
SUZUKI	Taiwan's Ford Lio-Ho Motor Co. Ltd., owned 70% by Ford, makes and sells minitrucks and minivans for Suzuki.
VOLKSWAGEN	Ford and VW have a joint venture for minivan production in Europe.
VOLVO	Volvo owns 26% of Hertz Corp., the largest U.S.-based rental-car company; Ford holds 49%.
OTHER	Ford and India's Maruti Udyog Ltd. produce aluminium radiators together in India through a joint venture formed in 1991. Ford owns 5.87% of India's Mahindra & Mahindra Ltd., which is building Escorts at its Nasik plant. Ford holds a 20% stake in China's Jiangling Motors Corp.

General Motors Corporation (United States)

AVTOVAZ	GM will supply fuel injection, ignition and emissions systems and wiring to Russia's AvtoVaz (Lada).
BMW	GM's joint venture with Chrysler, New Venture Gear Inc., supplies 5-speed manual transmissions to BMW's Rover.
BERTONE	Bertone builds a convertible version of the General Motors Astra.
CHINESE AUTOMOBILE	Taiwan's Chinese Automobile Co. Ltd. assembles Opel Astras for General Motors Corp. under an agreement signed in 1991. CAC also markets GM and Opel cars and has done since 1988.
CHRYSLER	GM and Chrysler have co-research projects under the direction of USCAR. Chrysler also has a joint venture with GM called New Venture Gear Inc. It combines Chrysler's New Process Gear operations in Syracuse, New York, U.S.A., with GM's Hydramatic Div. transmission plant in Muncie,

	Indiana, U.S.A. Chrysler owns 64% equity in the venture, GM, the remaining 36%.
DAEWOO	GM and Daewoo have parts making joint ventures in Korea.
FSO	FSO and GM have a joint venture that builds Opel cars.
FIAT	Fiat provides aluminium heads for some North American GM engines.
FORD	GM and Ford have several co-research projects under the direction of USCAR. Ford and GM own a stake in Budget Rent-A-Car Systems in Australia.
HOLDENS	Wholly owned subsidiary.
HONDA	GM supplies parts to Honda.
ISUZU	GM owns 37.5% of Isuzu, and the partnership is extensive. Each provides vehicles for the other to distribute. Isuzu General Motors Australia Ltd., a 60/40 Isuzu/GM venture, produces trucks at the Holden's Motor Co. Ltd. Dandenong assembly plant in Australia.
LOTUS	Wholly owned subsidiary.
MERCEDES-BENZ	Mercedes owns 25% of Detroit Diesel Corp. GM holds less than 1% of DDC after divesting in 1994.
MITSUBISHI	GM supplies parts to Mitsubishi.
NISSAN	GM is supplying parts to Nissan.
OPEL	Wholly owned subsidiary.
RENAULT	GM supplies axles and other components to Renault.
SAAB-SCANIA	GM owns a 50% stake in Saab Automobile AB, Saab-Scania owns the rest of the venture. GM supplies components to Saab, and Saab supplies components to GM.
SATURN	Wholly owned subsidiary.
SUZUKI	GM holds 3.5% equity in the Japanese automaker, and the two companies co-own an assembly venture in Canada, CAMI Automotive Inc.

TOYOTA	GM and Toyota have two 50-50 joint ventures. GM and Toyota officially dissolved their United Australian Automotive Industries joint venture in Australia, but the two continue to build vehicles for each other.
VAUXHALL	Wholly owned subsidiary.
VOLVO	A joint venture combines Volvo's North American heavy-truck operations with GM's North American Class 8 truck business.
OTHER	GM holds 67% of the stock in a Hungarian joint venture with Raba Magyar Vagon es Gepgyar. Raba owns the rest. In 1991, GM entered a joint venture with UAC of Nigeria plc to build vehicles in Nigeria. In India, GM has a joint venture with Hindustan Motors Ltd. to produce auto parts for worldwide distribution. GM holds a 30% stake in the company. GM has another joint venture with Hindustan to build Opel Astra cars beginning in 1997. GM also has a joint venture with the Birla Group in India. In China, GM and Jinbei Automobile Ltd. have formed a joint venture, Jinbei GM Automotive Co. Ltd., near Shenyang, China. GM holds a 30% interest in the venture.

Mitsubishi Motors Corporation (Japan)

CHINA MOTORS	Taiwan's China Motors is owned 15% by Mitsubishi. It assembles MMC cars and trucks.
CHRYSLER	Mitsubishi's U.S. assembly plant supplies cars to Chrysler. Chrysler supplies engines and transmissions for some of the cars built at the plant, including the MMC models. The two companies cooperate in design, production and distribution of vehicles and components. MMC and Chrysler are partners in a stamping plant in Ontario, Canada.
GENERAL MOTORS	Supplies parts to Mitsubishi.
HONDA	A joint venture in the Philippines, Honda Cars Philippines Inc., is owned 47% by Honda, 23% by

	Mitsubishi Corp. and 15% each by local companies Ayala Corp. and Rizal Commercial Banking Corp. Honda is supplying driveshafts to Mitsubishi.
HYUNDAI	Together, Mitsubishi Corp. and MMC own 12.63% of Hyundai. Hyundai builds a variety of cars and engines based on MMC designs.
ISUZU	Malaysia's Automotive Manufacturers Sdn. Bhd., 25% owned by Isuzu, assembles Isuzu, Citroen and Mitsubishi vehicles. Isuzu and Mitsubishi Corp. have a joint venture in the Philippines to make and sell one tonne pickup trucks.
MAZDA	MMC supplies Mazda in Indonesia with engine parts.
MERCEDES-BENZ	MMC and Mercedes-Benz have a joint venture, owned 51% by Mercedes-Benz and 49% by MMC, to distribute Mercedes cars in Japan. Mercedes' facility in East London, South Africa, builds Mitsubishi Colts.
PEUGEOT	PSA's Citroen supplies parts to Malaysia's Perusahaan Otomobile Nasional BHD (Proton), which is owned 30% by Mitsubishi Motors and Mitsubishi Corp.
PROTON	Mitsubishi Motors Corp. and Mitsubishi Corp. own 30% of Malaysia's Proton. Mitsubishi supplies components and technical assistance for cars built by Proton.
RENAULT	Renault supplies engines and transmissions for Mitsubishi's Dutch venture with Volvo.
SUZUKI	MMC and Suzuki are producing light trucks together in Indonesia.
VOLVO	Volvo, Mitsubishi and the Dutch government have a US$817 million-US$1.1 billion joint venture called Nederland Car BV.
OTHER	MMC cars are assembled in Venezuela via a venture between Japan's Nissho Iwai, Japan International Development Organisation Ltd. and Venezuelan

holding company Consorcio Inversionista Fabril S.A. (CIF).India’s Eicher Motors Ltd. is 15% owned by Mitsubishi and builds Mitsubishi-designed trucks. Mitsubishi owns a 10% stake in India’s Hindustan Motors, which will produce 1.3L and 1.5L gasoline and 2L diesel Lancer cars. Mitsubishi is involved in a number of joint ventures in Indonesia including P.T. Krama Yudha Ratu Motor, which assembles Mitsubishi trucks, and P.T. Krama Yudha Kesuma Motors, which assembles Mitsubishi passenger cars. In the Philippines, Mitsubishi is involved in a 50-50 joint venture Philippine Automotive Mfg. Corp. assembling Mitsubishi cars and trucks. MMC Sittipol Co. Ltd. of Thailand is owned 48% by Mitsubishi and assembles both Mitsubishi cars and trucks. In Malaysia, Perusahaan Otomobil Nasional Sdn. Bhd. is owned 15% by Mitsubishi and assembles the company’s trucks. Several foreign manufacturers assemble Mitsubishi trucks but lack equity from the company.

Toyota Motor Corporation (Japan)

DAEWOO	Daewoo and India’s DCM conglomerate have a car-building joint venture in India, with Daewoo controlling 51%, DCM 34% and Toyota 2.5%. The venture builds Daewoo Cielo cars and Toyota light commercial vehicles.
DAIHATSU	Toyota owns 33.4% of Daihatsu, which assembles some cars and supplies some engines to Toyota. Toyota also owns 10% of Daihatsu Australia Pty. Ltd., a vehicle wholesaler.
GENERAL MOTORS	As noted above, GM and Toyota have two 50-50 joint ventures.
ISUZU	Beginning 1997, Toyota, Nissan and Isuzu will share cast and forged parts for engines used in one tonne pickup trucks they each build in Thailand.

MERCEDES	Toyota and Mercedes signed a joint research and development deal in 1995.
NISSAN	Nissan and Toyota collaborate on development of some automotive parts.
RENAULT	Toyota is building commercial vehicles in Colombia with Japan's Mitsui and Co. Ltd. and Colombia's Sociedad de Fabricacion de Automotores SA (SOFASA). Renault holds 23.7% in the venture, Toyota 17.5% and Mitsui 7.5%.
VOLKSWAGEN	Volkswagen produces the Hilux, a Toyota-designed commercial vehicle, at its Emden, Germany, plant. Toyota markets Volkswagen and Audi cars in Japan.
OTHER	Toyota has a deal with three Taiwan auto companies to make and sell Corona, TUV and Dyna vehicles. Toyota owns a 40% stake in Siam Toyota Manufacturing in Thailand. It casts engine cylinder blocks, heads and crankshafts for Toyota's local assembly operation Toyota Motor Thailand Co. Ltd., which builds Hilux small trucks. UMW Toyota Motor Sdn. Bhd. is a Malaysian joint venture owned 18% by Toyota. It assembles and markets Toyota and Hino vehicles in Kuala Lumpur. Toyota holds 40% of a car assembly venture in Turkey called Toyota Sabanci Automotive Industry & Trade Inc. Toyota owns part of a production and marketing venture in Pakistan, called Indus Motor Co. Ltd., which assembles Toyota Corollas from knock-down kits at Karachi. Amar Assembly Plant Ud. of Trinidad and Tobago, Toyota de Venezuela of Venezuela, Ayax S.A. of Uruguay, Associated Vehicle Assemblers Ltd. of Kenya, and Toyota South Africa Mfg. Ltd. of South Africa all assemble Toyota cars and trucks. Toyota Motor Philippines Corp. of the Philippines, owned 25% by Toyota, currently produces the Crown, Corona, Corolla and TUV. Toyota produces Hiace vans in China under a joint venture with a Jinbei Automotive Co. Ltd. in Shenyang.

Sources: Wards 1996 and Ford 1996 Plant Guide.

C THE AUSTRALIAN AUTOMOTIVE INDUSTRY

C.1 Scope of the Australian automotive industry

The automotive industry in Australia is complex. Its activities include wholesale and retail of both new and used motor vehicles, repair, accessories, services and manufacturing of vehicles and components.

The manufacturing sector of the Australian automotive industry includes four producers of passenger motor vehicles (PMVs) and derivative light commercial vehicles.[1] The companies producing PMVs are all foreign owned. In addition to passenger vehicles and light commercial vehicle manufacturing, there is a significant heavy commercial vehicle sector in Australia.

There are also about 200 firms in Australia supplying components to automotive manufacturers. The majority of these are foreign controlled and many are not dedicated to the motor industry.

Motor spares and accessories and vehicle sales and service are also important aspects of the automotive industry in Australia, as are vehicle design and engineering services. In terms of the number of firms and the level of employment, the service and retailing sector of the automotive industry is significantly larger than manufacturing including the manufacture of trailers, vehicle bodies and caravans (see Table C.1).

Table C.1: **Relative employment in automotive industry sectors, Nov. 1996 labour force survey**

	Vehicle related Manufacturing	*Vehicle Retailing*	*Vehicle Wholesaling*	*Vehicle Servicing*
Employment[a]	70 300	51 700	40 000	204 100

a Employment is taken from ABS labour force data. It differs from the ABS manufacturing survey employment reported in Table C.2 because of a broader definition of automotive manufacturing to include the manufacture of trailers, vehicle bodies and caravans in addition to the manufacture of PMVs components and aftermarket parts.

Source: ABS (unpublished data).

1 The term derivative vehicles refers to the fact that all light commercial vehicles (LCVs) manufactured in Australia derive from passenger vehicle platforms.

C.1.1 Size of the manufacturing sector of the Australian automotive industry

Although other sectors of the automotive industry account for the majority of employment and turnover, this appendix deals primarily with the manufacturing sector of the Australian automotive industry. Table C.2 provides the Australian Bureau of Statistics' (ABS) summary of manufacturing operations for the automotive industry from 1989–90 to 1994–95. In 1994–95 the industry accounted for 6.9 per cent of manufacturing turnover. The industry accounted for 4.3 per cent of manufacturing value added in 1992–93 (the latest value added data available). In 1994–95 the industry contributed around one per cent of Australia's GDP.

Table C.2: **Summary of operations, 1989–90 to 1994–95[a]**

Industry class		*Employment at end of June*[b]	*Wages and salaries*[c]	*Turnover*	*Value added*
ANZSIC	*Description*	*(No.)*	*($m)*	*($m)*	*($m)*
1989–90					
2811	Motor vehicle mfg	34 119	965.8	8 457.2	3 229.9
2813	Automotive electrical and instrument mfg	7 851	189.0	878.3	410.2
2819	Automotive component mfg nec	27 084	703.8	2 657.7	1 367.6
281	**Total**	**69 054**	**1 858.6**	**11 993.2**	**5 007.7**
1990–91					
2811	Motor vehicle mfg	29 777	1 038.9	8 293.6	
2813	Automotive electrical and instrument mfg	6 654	177.6	796.7	
2819	Automotive component mfg nec	23 143	652.9	2 540.3	
281	**Total**	**59 574**	**1 869.4**	**11 629.7**	
1991–92					
2811	Motor vehicle mfg	25 372	732.3	7 564.8	
2813	Automotive electrical and instrument mfg	4 638	147.4	681.0	
2819	Automotive component mfg nec	20 333	565.3	2 153.1	
281	**Total**	**50 343**	**1 445.0**	**10 399.0**	

... continued

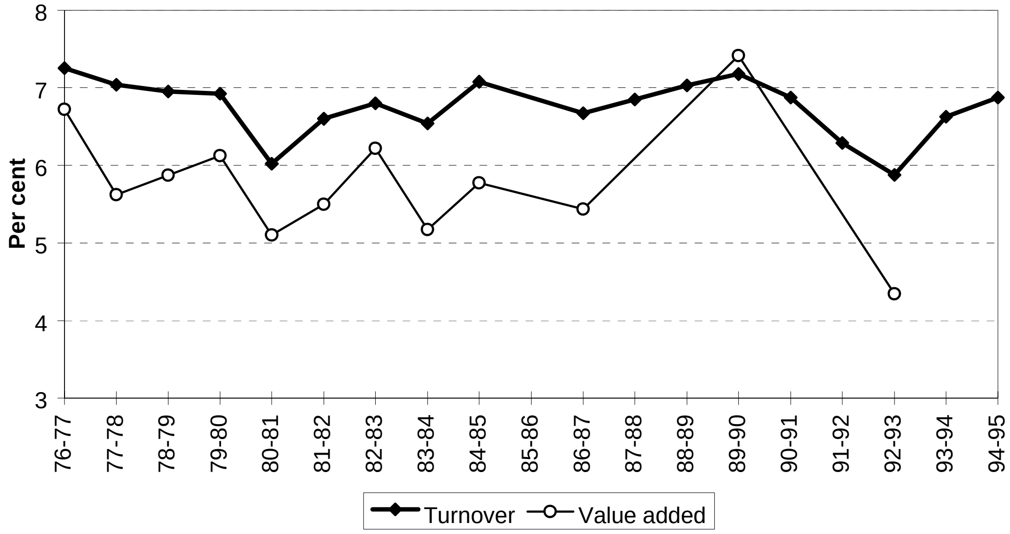
Table C.2: **Summary of operations, 1989–90 to 1994–95[a]** (continued)

Industry class		*Employment at end of June[b]*	*Wages and salaries[c]*	*Turnover*	*Value added*
ANZSIC	*Description*	*(No.)*	*($m)*	*($m)*	*($m)*
1992–93					
2811	Motor vehicle mfg	22 801	704.3	7 106.8	1 593.2
2813	Automotive electrical and instrument mfg	4 553	128.3	710.8	213.7
2819	Automotive component mfg nec	19 453	552.3	2 172.8	1 067.8
281	**Total**	**46 808**	**1 384.8**	**9 990.4**	**2 874.7**
1993–94					
2811	Motor vehicle mfg	22 541	778.5	8 996.0	
2813	Automotive electrical and instrument mfg	3 953	109.3	633.8	
2819	Automotive component mfg nec	20 377	609.0	2 563.1	
281	**Total**	**46 871**	**1 496.8**	**12 192.9**	
1994–95					
2811	Motor vehicle mfg	23 107	851.3	9 717.7	
2813	Automotive electrical and instrument mfg	4 634	152.6	793.1	
2819	Automotive component mfg nec	19 447	597.7	2672.7	
281	**Total**	**47 188**	**1601.6**	**13 183.4**	

a Does not include ANZSIC industry class 2812 motor vehicle body mfg.
b Includes working proprietors.
c Excludes the drawings of working proprietors.
Source: ABS (Cat. Nos. 8202.0, 8221.0 and unpublished data).

In 1976–77 the industry accounted for 7.3 per cent of manufacturing turnover and 6.7 per cent of manufacturing value added (see Figure C.1). On the basis of ABS data, the share of manufacturing employment represented by the automotive industry has also declined from 6.6 per cent in 1976–77 to 5.1 per cent in 1994–95.

Figure C.1: **Automotive industry share of manufacturing turnover and value added, 1976–77 to 1994–95[a]**



a Figures before 1989–90 are for ASIC codes 3233 and 3235 and do not include industry class 3232 motor vehicle bodies, trailers and caravans. Figures from 1989–90 onward are for ANZSIC codes 2811, 2813 and 2819 and do not include industry class 2812 motor vehicle body mfg. No figures were collected in 1985–86, value added was only collected every three years from 1986–87. 1994–95 data is preliminary.

Source: ABS (Cat. Nos. 8202.0 and 8221.0).

Nonetheless, the automotive industry remains a significant employer, particularly beyond manufacturing in the services sector. Employment and labour market issues are dealt with in more detail in Appendix H.

C.1.2 Regional concentration

The majority of PMV production and manufacturing employment is in Victoria and South Australia. Victoria accounted for about half of automotive manufacturing activity in 1994–95. Most of the balance took place in South Australia (See Table C.3). Chapter 12 provides employment data at the regional level for Adelaide, Melbourne and South Western Victoria around Geelong.

Table C.3: **Summary of operations, Victoria and South Australia, 1994-95[a]**

Industry class		*Employment at end of June*[b]	*Wages and salaries*[c]	*Turnover*	*Share of total turnover*
ANZSIC	*Description*	*(No.)*	*($m)*	*($m)*	*(%)*
Victoria					
2811	Motor vehicle mfg	12 490	441.3	5340.3	
2813	Automotive electrical and instrument mfg	3379	119.3	632.3	
2819	Automotive component mfg nec	7498	249.4	1140.2	
281	**Total**	**23 755**	**810.0**	**7112.7**	**53.9**
South Australia					
2811	Motor vehicle mfg	np	np	np	
2813	Automotive electrical and instrument mfg	259	6.5	41.8	
2819	Automotive component mfg nec	np	np	np	
281	**Total**	**13 946**	**486.5**	**4371.7**	**33.2**

np Not published.
a Does not include ANZSIC industry class 2812 motor vehicle body mfg.
b Includes working proprietors.
c Excludes the drawings of working proprietors.
Source: ABS (unpublished data).

C.2 Local PMV production

In 1985, 13 PMV models were being produced by five manufacturers at eight plants around Australia. By 1992, eight model lines were being produced at six plants. Nissan closed its Clayton plant in 1992 when it ceased PMV manufacturing in Australia. Ford closed its Homebush plant in 1994 and Toyota transferred the production of the company’s two models to its new Altona plant over the period 1994 to 1995, rationalising its Port Melbourne and Dandenong operations. Currently, there are five model lines being produced by four PMV manufacturers.

The four local PMV manufacturers are — Ford Motor Company of Australia Ltd; General Motors-Holden’s Automotive Ltd; Toyota Motor Corporation Australia; and Mitsubishi Motors Australia Ltd.

Local PMV production, while fluctuating with economic conditions, has trended downwards, while value added has trended upwards. Since 1985 the number of units produced has fallen by around 15 per cent from 380 000 units to 325 000 units (see Table C.4).

Table C.4: **Production of PMVs, 1988 to 1996[a]**

	Model Volume					***Total***	*Real*
	Falcon	*Commodore*	*Camry*	*Magna*	*Corolla*	***Units***[b]	*Value*[c]
	No.	*No.*	*No.*	*No.*	*No.*	***No.***	*1996 $m*
1985	102 488	39 861		30 054	26 981	**382 167**	na
1986	91 856	57 752		32 319	28 870	**317 289**	na
1987	93 081	65 463	21 825	33 929	22 012	**309 773**	6 121
1988	90 652	57 053	29 986	40 483	25 190	**331 245**	6 443
1989	94 009	88 579	42 158	38 430	24 117	**373 339**	7 454
1990	81 172	83 586	36 680	33 625	34 558	**377 461**	7 361
1991	58 989	61 661	38 303	29 074	27 399	**288 380**	5 706
1992	67 160	69 734	31 520	36 715	25 908	**277 725**	5 774
1993	80 527	73 506	39 977	52 446	26 864	**294 070**	6 818
1994	88 949	97 868	53 943	47 856	25 333	**322 893**	7 648
1995	102 076	107 345	38 954	39 724	24 285	**312 384**	7 556
1996	100 115	108 006	50 396	43 916	23 198	**325 631**	7 810

a Includes production of the Falcon utility and van and Commodore utility.
b Includes production of models now discontinued.
c Real wholesale selling price.
Source: AIA (various years) and DIST (1995b and 1996b).

For much of the 1980s, Ford produced the largest number of PMVs. However, since 1994 Holden has been the largest producer. Holden has continued to be the largest producer in 1996. Toyota has been the third largest and Mitsubishi the smallest of the four current Australian producers. Until their plant closure in 1992, Nissan was the fourth largest producer.

Average annual plant production runs for locally manufactured PMVs have increased from around 48 000 units in 1985 to over 81 000 units in 1996. Two of the current models (the Falcon and Commodore) are produced in plants that have production runs of over 100 000 units. Both of those models are rear wheel drive, six cylinder cars produced almost exclusively for the domestic market.

By comparison, Japanese and US car manufacturers typically produce models at volumes of between 130 000 and 150 000 cars per annum, with some production volumes being twice as much again (Standard and Poor's, sub. 6, p. 4). Table C.5 presents figures for three Australian built vehicles from the small, medium and upper medium sectors and compares their volumes with those from overseas plants producing comparable vehicles.

Table C.5: **International plant capacity comparisons**

Australian plant			*Overseas plant*		
Location	*Vehicles produced*	*Capacity*	*Location*	*Vehicles produced*	*Capacity*
Altona, Vic	Toyota Corolla/ Camry	100 000	Cambridge, Canada	Toyota Corolla	100 000 (expanding to 200 000)
			Georgetown, US	Toyota Camry/ Avalon	400 000
Broadmeadows, Vic	Ford Falcon	120 000	Chicago, US	Ford Taurus/ Mercury Sable	300 000

Source: Industry Commission.

Current Australian capacity is estimated by the FCAI to be around 375 000 units annually. This would rise to above 400 000 units if a second line at Holden's Elizabeth plant is commissioned. The FCAI Manufacturers Group claimed that local producers require capacity utilisation to be running at around 85–90 per cent to obtain a reasonable return on their investment:

> With an installed capacity of 375,000 units, maintaining viability to the year 2000 will require 320,000–350,000 cars to be produced. (sub. 33, p. 33)

This point was also made by Holden in its submission:

> Capacity utilisation must always be in the region of 85 per cent or more for acceptable financial results. (sub. 19, p. 11)

Yet Toyota claimed a higher level of capacity utilisation is required to earn acceptable returns:

> In the case of Toyota Australia, we most certainly need to utilise all of the 100,000 unit per annum capacity at Altona in order to generate sufficient profitability to fund investment required to maintain a world class production facility. (sub. 15, p. 39)

Clearly the level of capacity utilisation required to generate viable returns will depend on the circumstances of the individual plant.

C.2.1 Commercial vehicles

The ABS estimated that about 27 300 commercial vehicles — both light and heavy commercial — were produced in Australia in 1996. Most locally manufactured commercial vehicles (18 700 units) are in the derivative LCV category.[2] However, there are also significant truck manufacturing and assembly operations in Australia.

C.3 PMV exports

Exports of completely built up (CBU) PMVs have increased significantly from under 3000 units in 1985 to over 20 000 units for the last seven years. During this period both Ford and Mitsubishi started significant export programs with the Capri and Magna.[3]

Exports of CBU PMVs numbered 39 631 in 1996, with a value of $837 million free on board (FOB). This was a 73 per cent increase over 1995 exports of CBU PMVs. Although the volume of clearances has fluctuated, the value of exported CBU PMVs has been increasing since 1989 (see Table C.6).

The greatest number of CBU PMVs exported from Australia in 1996 were to New Zealand. New Zealand received 43 per cent of all CBU PMV exports from that year (see Table C.7). NAFTA and the Middle East were the next largest export destinations. No other destination accounted for more than five per cent of CBU PMV exports.

Exports of LCVs from Australia are restricted to a few thousand vehicles to New Zealand and South Africa.

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[2] Australian vehicle manufacturers produce LCVs as a derivative of the platforms for the Commodore and Falcon. That is, although the body shape of LCVs is significantly different, the chassis and much of the running gear is the same as that used in the PMV configurations.

[3] Ford geared up for its Capri export program in 1989 and the first Capri was exported to the US in 1990. The program was wound down in 1993, the final Capri was produced in 1994.

Table C.6: CBU PMV exports and their real value FOB, 1985 to 1996

Year	*Export clearances*	*Real value FOB*	*Change in value from previous year*
	No.	*1996 $m*	*%*
1985[a]	2 541	43.1	na
1986	4 594	70.7	64.0
1987	10 119	175.8	148.7
1988[b]	1 857	29.7	-83.1
1989	6 392	121.4	308.8
1990	25 620	407.8	235.9
1991	27 604	432.6	6.1
1992	25 627	450.9	4.2
1993[c]	26 328	590.7	31.0
1994	22 253	474.1	-19.7
1995	22 693	483.7	2.0
1996	39 631	836.6	73.0

a The values for 1985 to 1987 are based on the allocation of exports to the ASIC industry classes 3231, 4233 and 3234. These industry classes include PMVs and components, LCVs, buses and certain trucks and their components.

b The values from 1988 were derived from the Australian Harmonised Export Commodity Classification (AHECC). The use of AHECC codes enables a more specific identification of automotive exports. However, the figures are broadly comparable across the years.

c From 1993 includes specialist commercial vehicles

Source: ABS (unpublished data).

Table C.7: Exported CBU PMVs by destination, 1993 to 1996[a]

	1993		*1994*		*1995*		*1996*	
Destination	*Value*	*Share*	*Value*	*Share*	*Value*	*Share*	*Value*	*Share*
	$m	*%*	*$m*	*%*	*$m*	*%*	*$m*	*%*
New Zealand	184.6	32.8	269.0	58.0	322.4	66.4	360.3	43.1
NAFTA	195.8	34.8	84.6	18.2	16.8	3.5	206.8	24.7
Middle East[b]	na	na	na	na	na	na	109.0	13.0
Japan	38.3	6.8	34.6	7.5	63.0	13.0	37.2	4.4
ASEAN	38.4	6.8	59.0	12.7	60.9	12.5	14.8	1.8
EU	90.2	16.0	2.4	0.5	10.6	2.2	0.8	0.1
Other	15.0	2.7	14.1	3.0	11.6	2.4	107.8	12.9
Total	**562.3**	**100.0**	**463.7**	**100.0**	**485.3**	**100.0**	**836.7**	**100.0**

a Figures are nominal because of differing composition of exports to each destination.

b Middle East not separated out from rest of world in original source until 1996.

Source: ABS (unpublished data).

C.4 PMV imports

The ABS estimated that CBU PMVs comprised about one third of the value of automotive imports in 1996. Over the period 1989 to 1996 imported CBU PMVs have increased. Table C.8 presents data for imported CBU PMVs.

Table C.8: **CBU PMV imports and their real value FOB, 1985 to 1996**

	Import clearances	*Real value FOB*	*Change in value from previous year*
	No.	*1995 $m*	*%*
1985	114 525	1 616.0	na
1986	69 628	1 030.8	-36.2
1987	52 759	813.4	-21.1
1988	76 311	1 291.8	58.8
1989	126 262	2 033.4	57.4
1990	115 151	1 910.1	-6.1
1991	123 708	1 847.7	-3.3
1992	147 406	2 231.3	20.8
1993	158 663	2 238.8	0.3
1994	182 256	2 573.4	14.9
1995	214 843	2 751.4	6.9
1996	233 287	2 954.7	7.4

Source: ABS (unpublished data).

In 1996, over 233 000 PMVs were imported with a value of nearly $3 billion. Imported PMVs presently dominate the small/micro/light and luxury vehicle segments.

There are currently over 20 specialist importers of passenger motor vehicles into Australia. The five largest specialist importers, by PMV sales, in 1996 were Hyundai (48 871 unit sales), Mazda (20 614), Honda (16 201), Nissan (14 289) and Daewoo (12 750).

In addition, Australian vehicle producers are themselves significant importers. Over 64 000 units (30 per cent) were imported by Australian vehicle producers. For example, Ford was the second highest seller of imported PMVs (29 484 unit sales) in 1996. Mitsubishi (13 590), Holden (11 093) and Toyota (9 093) were the sixth, eighth and ninth highest sellers of imported PMVs respectively (VFACTS various years).

The greatest number of CBU PMVs imported into Australia in 1996 were from Japan. Japanese products made up 43 per cent of all CBU PMV imports for that year (see Table C.9). The Republic of Korea and Germany were the next largest sources of imports. No other country accounted for more than five per cent of CBU PMV imports.

Korean imports also showed the largest growth in import share, rising to 33 per cent in 1996 from only 17 per cent in 1993.

Table C.9: **Imported CBU PMVs by source country, 1993 to 1996**

	1993		*1994*		*1995*		*1996*	
Country of origin	*Units*	*Share*	*Units*	*Share*	*Units*	*Share*	*Units*	*Share*
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Japan	114 445	72.1	112 028	61.5	98 680	45.9	99 425	42.6
Germany	9 968	6.3	14 159	7.8	16 483	7.7	17 411	7.5
Korea	27 007	17.0	34 658	19.0	65 211	30.4	78 948	33.8
Sweden	3 335	2.1	4 507	2.5	3 472	1.6	3 053	1.3
UK	461	0.3	1 795	1.0	4 172	1.9	6 409	2.7
Belgium	1 002	0.6	1 417	0.8	6 852	3.2	7 049	3.0
Other	2 445	1.6	13 692	7.5	19 964	9.3	20 992	9.0
Total	**158 663**	**100.0**	**182 256**	**100.0**	**214 834**	**100.0**	**233 287**	**100.0**

Source: ABS (unpublished data).

C.5 Automotive components in Australia

Production and trade in automotive components is a significant part of the automotive industry. This sector has been the focus of much change in the past decade. It is a sophisticated and diverse sector of the industry.

C.5.1 Local component production

FAPM reported that there were almost 200 firms in Australia supplying components to passenger vehicle producers (FAPM 1996b, p. 5). The ABS estimated that turnover for the component sector was around $3.4 billion in 1994–95 and these firms employed approximately 24 000 people.

C.5.2 Exports of components

To date, Australian exports of components and completely knocked down vehicle packs (CKDs) have been greater than CBU vehicle exports. A wide range of components are exported including engines, braking equipment, wheels, driveline components, transmissions, air conditioning equipment and friction material. The ABS estimated that the total value of vehicle and component exports in 1996 was around $2 174 million, of which about $837 million was CBU PMVs and the balance ($1 337 million) components, non-PMV vehicles and CKDs (see Table C.10).

Table C.10: **Total real automotive exports, 1985 to 1996** (1996 dollars)

	CBU PMVs	*Components*			*Total*[a]
		CKD PMVs	*Engines and engine parts*	*Other components*[b]	
	1996 $m	*1996 $m*	*1996 $m*	*1996 $m*	*1996 $m*
1985	43.1	131.8	0.0	576.2	751.2
1986	70.7	93.8	0.0	514.9	679.4
1987	175.8	186.6	0.0	601.0	963.4
1988	29.7	109.5	0.0	655.7	794.9
1989	121.4	138.2	0.0	601.1	860.6
1990	407.8	64.4	418.0	291.5	1181.6
1991	432.6	33.7	388.2	425.4	1279.9
1992	450.9	59.9	373.9	544.0	1428.8
1993	590.7	14.4	366.8	551.1	1523.0
1994	474.1	30.4	372.3	672.9	1549.7
1995	483.7	40.9	510.8	751.0	1786.3
1996	836.6	34.9	479.7	822.6	2173.8

a Figures before 1990 understate the value of exports but are still broadly comparable.

b Engines and engine parts are not separated out from other components before 1989. Other components includes vehicles other than PMVs.

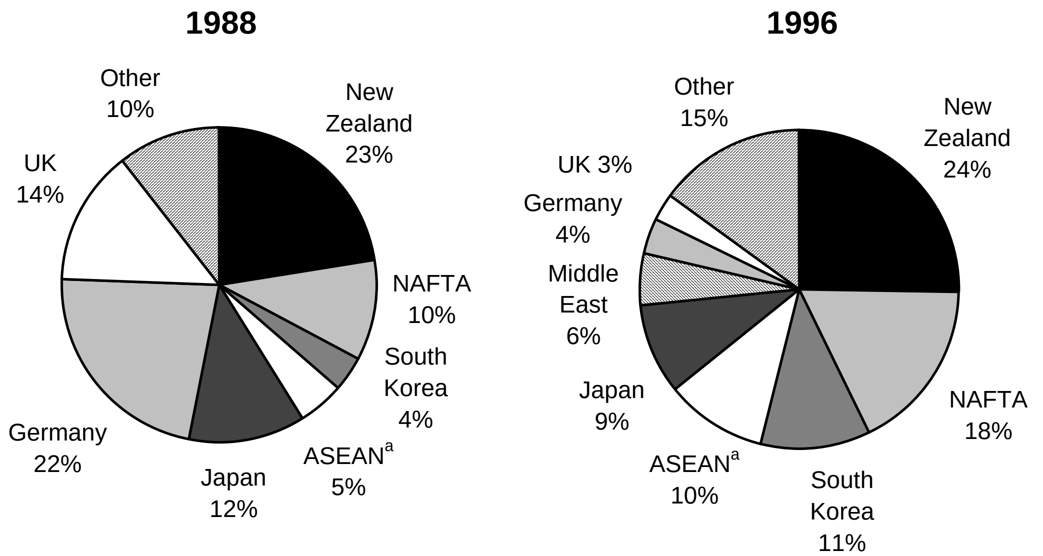
Source: ABS (unpublished data).

Although they no longer have a CBU production capacity, Nissan exported $65 million of engines, components and castings from its Dandenong plant during 1995. Other major exporters include:

- engines from Holden's Mechanical Manufacturing Operations' Port Melbourne plant, mainly to Daewoo in Korea;
- braking systems by PBR Automotive to General Motors in the US;
- alloy wheels by ROH to Nissan in Japan; and
- disc brake pads for the aftermarket by Bendix Mintex into North America, New Zealand, Japan, Europe, Asia and the Middle East.

Automotive exports have increasingly been to the Asia Pacific region between 1988 and 1996. Major export destinations in 1996 were New Zealand, which imported mainly CBU PMVs; Japan, which imported mainly components; and Korea, which imported mainly engines. Exports of PMVs and components to the ASEAN countries has also increased (see Figure C.2).

Figure C.2: **Total automotive exports by destination, 1988 and 1996**



a ASEAN consists of Brunei, Indonesia, Malaysia, The Philippines, Singapore and Thailand.

Source: ABS (unpublished data).

C.5.3 Imports of components

Similarly to exports, components are the larger share of the value of imports in the automotive industry. Components comprise about two thirds of the value of automotive imports. In 1996 the total value of automotive imports was a little more than $9 billion of which $6 billion was components. This has grown from $5.1 billion in 1988, of which $3.7 billion was components (see Table C.11).

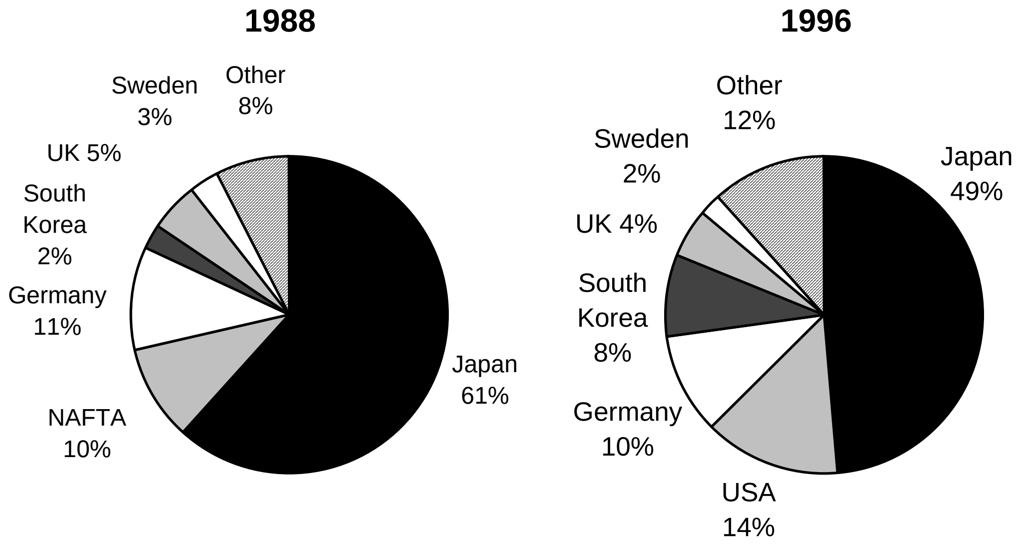
Table C.11: **Total real automotive imports, 1988 to 1996[a]** (1996 dollars)

	CBU PMVs	*Components[b]*	*Total*
	1996 $m	*1996 $m*	*1996 $m*
1988	1 291.8	3 780.8	5 072.6
1989	2 033.4	5 356.9	7 390.3
1990	1 910.1	5 039.2	6 949.3
1991	1 847.7	3 967.2	6 215.5
1992	2 231.3	4 722.2	7 193.0
1993	2 238.8	5 050.5	7 435.6
1994	2 573.4	5 786.2	8 436.1
1995	2 751.4	5 579.2	8 330.7
1996	2 954.7	6 207.4	9 162.1

a Figures understate the value of imports.
b Components include CKD PMVs and other (non-PMV) vehicles.
Source: ABS (unpublished data).

Japan has remained the major source of Australian imports of automotive components between 1988 and 1996. However its share has declined over this period. South Korea has emerged as a major source of imports, however the majority are CBU PMVs not components (see Figure C.3).

Figure C.3: **Total automotive imports by source, 1988 and 1996**



Source: ABS (unpublished data).

C.6 Australian automotive services industry

As noted previously the service sector of the automotive industry is larger than the manufacturing sector. The Motor Trades Association of Australia (MTAA) estimated that, at June 1993, it represented the interests of about 80 000 retail outlets, 40 000 firms and 270 000 staff. The turnover of the sector was estimated by MTAA to be around $49 billion at that time. The size of this part of the automotive industry is largely, although not entirely, indifferent to the relative levels of imported or locally made automotive products.

An important element of services provided to the automotive industry is engineering and design. The Australian automotive industry is expected to benefit from the export of engineering and design services to the growing markets of Asia. Holden is one company that believes opportunities exist in this area.

> Holden is to be GM’s regional engineering centre for Asia Pacific. Provided, once again, the domestic operation continues to be viable and efficient, incremental expansion will enable the regional engineering role to be fulfilled at moderate investment. Australian labour costs for expert engineering personnel are very competitive with other locations - particularly in Europe or North America, so the cost picture is favourable. (sub. 19, p. 24)

More recently, Holden announced General Motors was making it responsible for development of its large rear-wheel drive cars outside North America. This may create export opportunities for Holden supplied niche rear wheel drive models to markets like the Middle East (see Appendix F).

D THE AUSTRALIAN VEHICLE MARKET

D.1 The motor vehicle stock in Australia

Australia has one of the highest rates of car ownership in the world. The stock of vehicles in 1995 was 10.9 million, including 8.6 million PMVs. This equated to 606 vehicles (478 PMVs) per 1000 population, a vehicle for every 2.2 Australians (ABS Cat. No. 9309.0). Comparisons with various countries are presented in Table D.1.

Table D.1: **Characteristics of the vehicle stock in selected countries**

	Vehicle stock	*PMV stock*	*Vehicle ownership per 1000*	*PMV ownership per 1000*
US	195 469 000	147 171 000	750	565
Canada	17 439 600	13 700 000	620	487
Australia	**10 947 530** [a]	**8 628 806**	**606**	**478**
Germany	42 877 911	39 917 577	529	492
Japan	65 011 472	42 678 430	519	340
UK	27 436 878	23 831 906	472	410
Korea[b]	7 404 347	5 148 713	164	114
Malaysia	2 511 684	2 476 913	130	128

a Includes motor cycles, excludes plant and equipment, caravans and trailers.

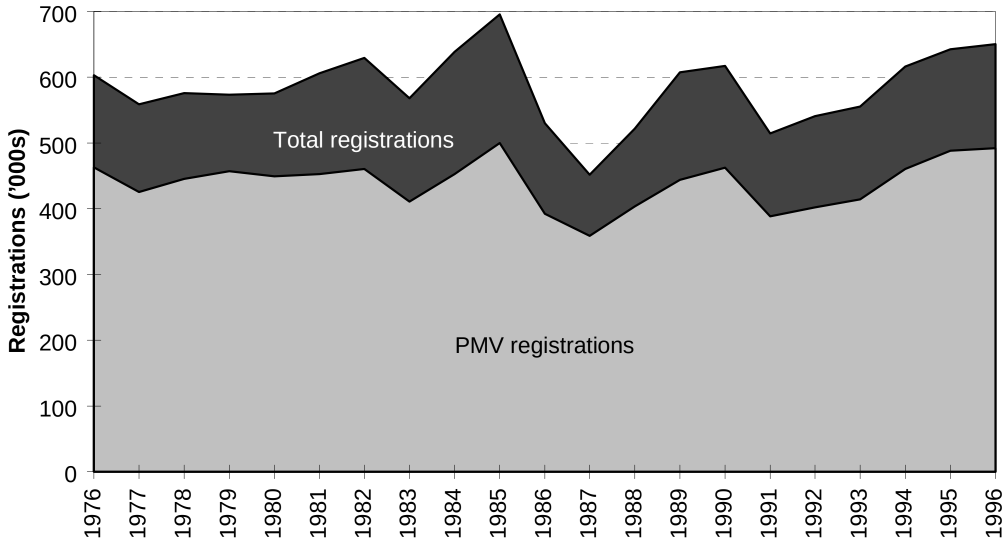
b The Republic of South Korea.

Source: AAMA (1996) and ABS (Cat. No. 9309.0).

The vehicle stock has increased more quickly than Australia's population growth. Vehicle ownership levels have risen substantially, from 471 per 1000 population in 1976 to 606 per 1000 population in 1995.

However, the number of new PMV registrations, while fluctuating, has remained relatively stable over the last two decades (see Figure D.1). Therefore, as population has grown the rate of new PMV purchases per capita has ceased growing significantly and has declined between 1976 and 1995. In that period it dropped from 33 new PMV registrations per 1000 population to a low of 22 per 1000 population in 1985. On this basis, the Australian market can be defined as mature.

Figure D.1: **PMV and total new vehicle registrations 1976 to 1996**



Source: PAXUS and VFACTS.

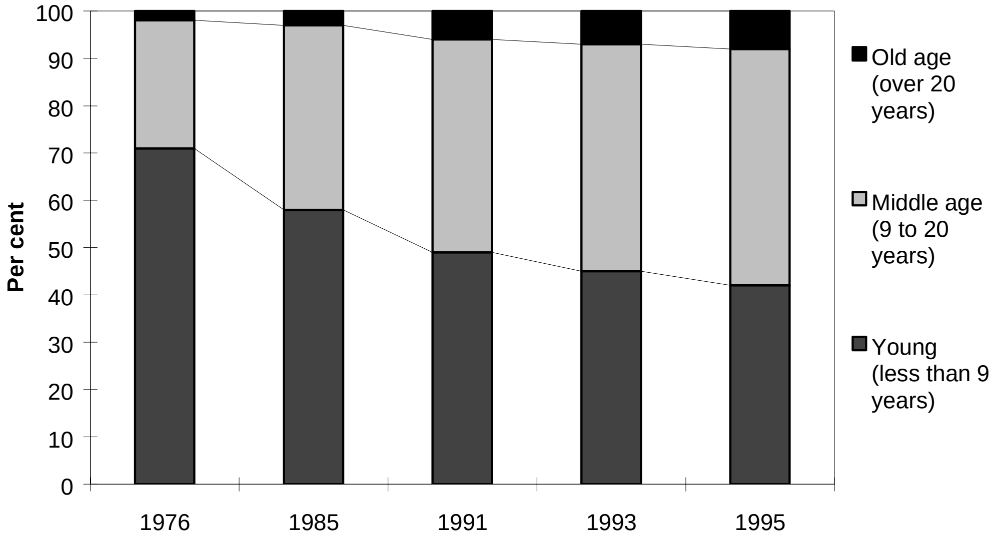
Australia has a low rate of new PMV purchases when compared to other developed countries. However, Australia's rate of new PMV purchases has been rising over the last five years as other countries' rates have been falling. New PMV registrations in Australia have grown consistently since the recession in 1990–1991 and the rate of new PMV purchases has grown to 27 per 1000 population. However, many influences, unique to particular countries, impact on new PMV purchases. These influences include consumer preferences, environmental factors, demographics and taxes. For example, Australia's strong secondary market for fleet vehicles complicates any comparison between it and other countries. Therefore, some caution should be used when making comparisons between countries.

As the rate of ownership has risen and the replacement rate has fallen the Australian vehicle stock has aged. The average age of the stock increased from 8.0 years in 1985 to over 10.6 years in 1995 (ABS, Cat. No. 9309.0). This compares to an average age of 8.5 years in the US for the same year.

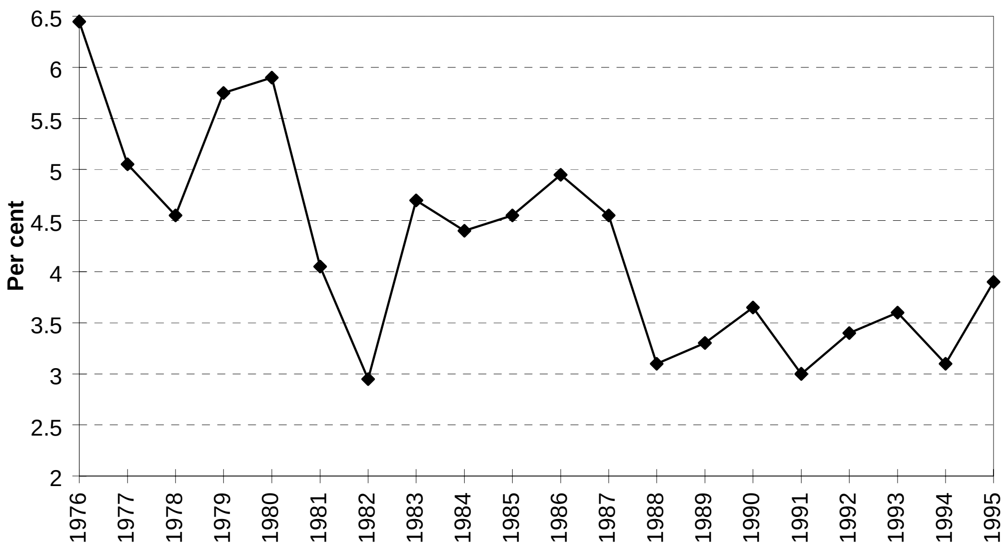
The change in age distribution of the vehicle stock since 1976 is shown in Figure D.2. Cars older than 8 years made up 29 per cent of the vehicle stock in 1976. By 1995 this had increased to 58 per cent.

Figure D.2 also presents the replacement ratio for the Australian vehicle stock between 1976 and 1995. The replacement rate represents the percentage of the fleet that is scrapped or replaced each year.

Figure D.2: **Age distribution of the Australian vehicle stock, 1976 to 1995**



Vehicle stock replacement ratio, 1976 to 1995



Sources: ABS (Cat. No. 9309.0) and FCAI, Importers Group (sub. 46, p. 36).

At the same time as the replacement rate has declined the affordability of vehicles has also decreased. Since 1985 car prices have risen considerably faster than the Consumer Price Index (CPI) and average weekly earnings. Cars are between 15 and 20 per cent less affordable in 1996 than they were in 1985. A detailed discussion on car affordability and prices is contained in Chapter 4.

D.2 Local PMV market

A major change in the PMV market occurred in 1988 when import quotas were abolished. Since then, there have been numerous new entrants into the domestic market. They have tended to target the small car segment of the market, especially a number of Korean manufacturers.

The new entrants and the existing importers have also extended the product range available to the Australian consumer. For example, new markets have been created. The FCAI Importers Group noted:

> The abolition of quotas allowed the range of imported cars to be widened, with light cars effectively opening up a new part of the market. (sub. 46, p. 7)

D.2.1 Market segments

The passenger motor vehicle market is generally divided up into four major segments, following the methodology of VFACTS which compiles the registration figures for the industry.[1]

- The small car segment includes cars such as the Mitsubishi Lancer. The Toyota Corolla is the only locally produced car in this segment. This segment includes micro cars (below 1000 cc) such as the Daihatsu Mira and light cars (1000–1400 cc) such as the Nissan Micra. Micro/light PMV sales are separated out in Figure D.3, which shows the recent growth of this class within the small car segment.
- The medium segment includes the two Australian built four cylinder vehicles, the Mitsubishi Magna and Toyota Camry.
- The upper medium segment is dominated by locally produced cars including the Holden Commodore, Ford Falcon, Mitsubishi Magna V6/Verada and Toyota Camry V6/Vienta.

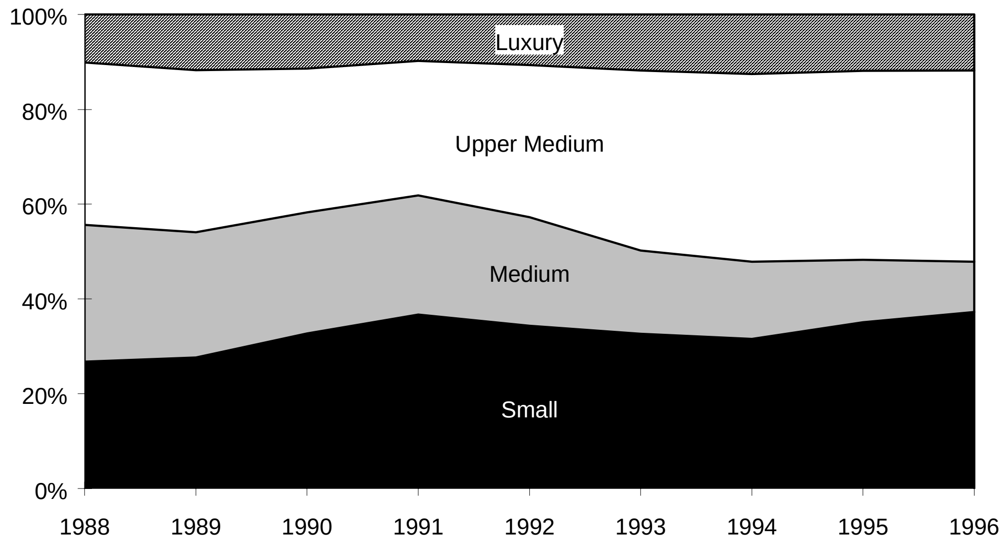
[1] As with any classification system definitions can be arbitrary. For example, the I4 Magna (medium segment) and the V6 Magna (upper medium) are basically the same car with a different engine, yet are included in different market segments.

- The luxury segment includes sports cars and, since 1993, people movers. The Holden Statesman and Caprice and the Ford Fairlane and LTD are the only local vehicles in this segment.

D.2.2 Changes in the market

Since 1988 there have been significant changes in each segment's share of the total market. Figure D.3 presents PMV market share by segment for the period 1988 to 1996.

Figure D.3: **Market share by segment, 1988 to 1996**



Sources: PAXUS and VFACTS.

Small cars

The relative share of small vehicles in the total PMV market has risen from around 27 per cent in 1988 to 37 per cent in 1996 (see Figure D.3). The major growth in imported vehicles has occurred in this segment.

Much of this growth has been driven by the emerging micro/light class, for which none of the local producers currently cater. Sales of micro/light cars have increased from 9 756 units in 1988 to 47 796 units in 1996 to make up 26 per cent of the small car segment.

The withdrawal of Australia's automotive manufacturers from small vehicle production has also contributed to the growth in the share of imports in this segment. Over the period 1988 to 1996 local production of the Ford Laser and the Nissan Pulsar ceased and the number of Toyota Corollas/Holden Novas has remained effectively unchanged.

The share of imports in the small vehicle segment has increased from 25 per cent in 1988 to over 86 per cent in 1996 (see Figure D.4).

Medium cars

The medium car segment has declined from 29 per cent of the market in 1988 to just over 10 per cent in 1996 (see Figure D.3). The medium vehicle segment has also witnessed a reduction in the share of locally produced vehicles.

From 1988 to 1996 the share of locally produced vehicles has fallen from 85 per cent to 65 per cent. However, this is due more to the shrinking size of the segment than to an increase in imported cars sold. Sales of imported medium cars have remained relatively stable over the period (see Figure D.4).

Upper medium cars

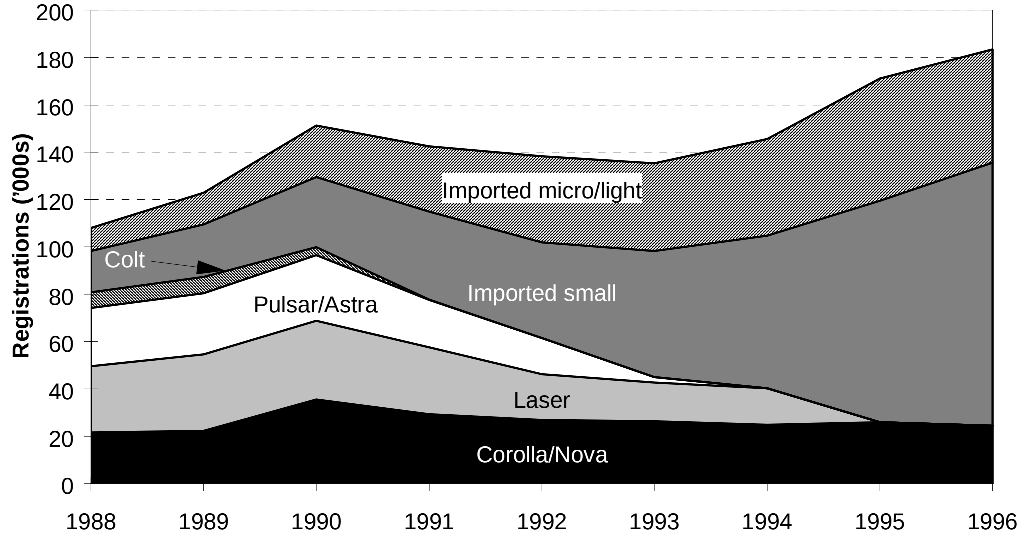
The upper medium vehicle segment remains dominated by the locally produced Holden Commodore and Ford Falcon. To date, this segment has faced minimal direct import competition. The relative size of the upper medium segment has expanded from about 34 per cent to just over 40 per cent of all PMV sales in the period 1988 to 1996 (see Figure D.3).

Mitsubishi and, to a lesser extent Toyota, have shifted their focus from four cylinder medium cars to V6 versions of the Magna and Camry, contributing to the growth in this segment (see Figure D.5).

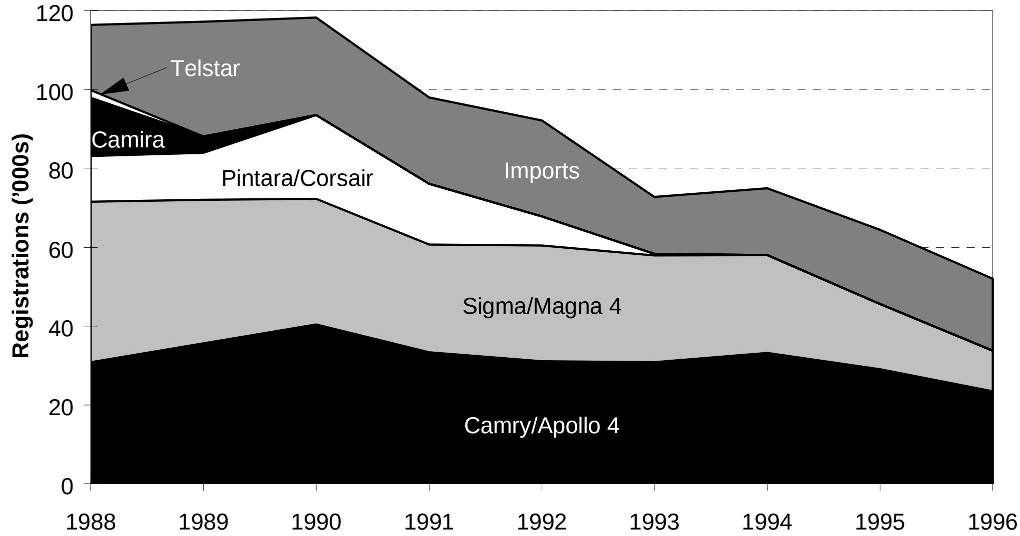
Luxury cars

The luxury car segment of the market has been steady in recent years at around 11 per cent. Imports continue to dominate this segment (see Figures D.3 and D.5). Sales in this segment relate closely to the health of the economy (AAIR various issues).

Figure D.4: **Registrations of micro and light and small cars, 1988 to 1996**

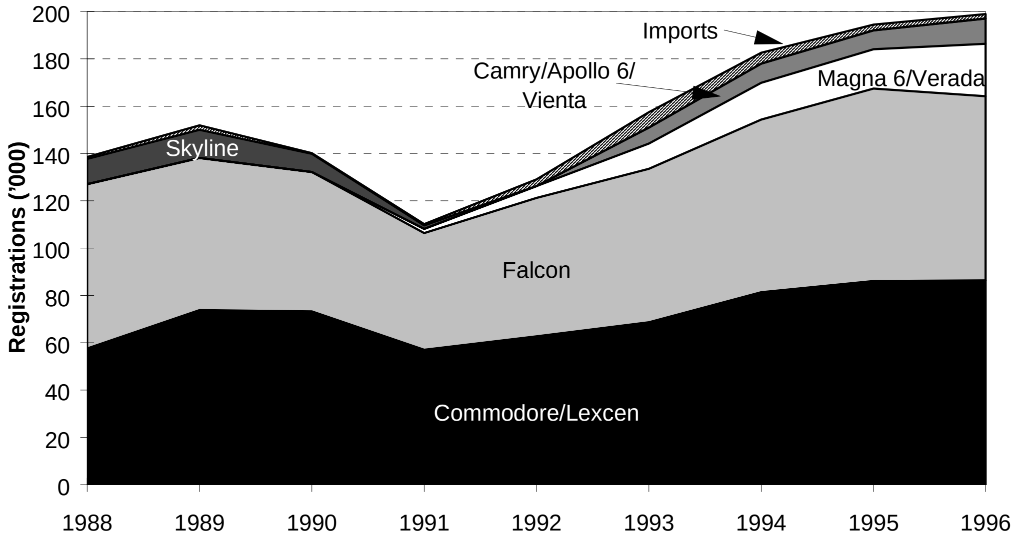


Registrations of medium cars, 1988 to 1996

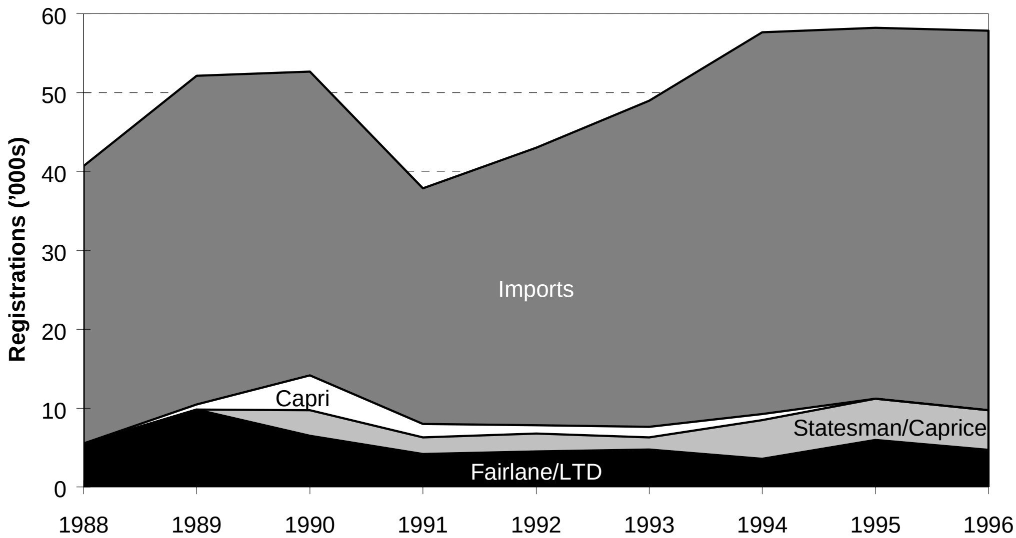


Sources: PAXUS and VFACTS.

Figure D.5: **Registrations upper medium cars, 1988 to 1996**



Registrations of luxury cars, 1988 to 1996



Sources: PAXUS and VFACTS.

D.2.3 Fleet sales

Fleet sales are a very important source of sales for the domestic vehicle manufacturers. All local models rely on Government and private vehicle fleet purchasers for over 50 per cent of their sales. The upper medium segment relied on fleet purchasers for almost 75 per cent of sales in 1996 (see Table D.2).

Table D.2: **Local PMV sales, by purchaser, 1995 and 1996** (per cent)

	1995			*1996*		
	Private	*Government fleet*	*Non-Govt fleet*	*Private*	*Government fleet*	*Non-Govt fleet*
Falcon	23.02	28.68	48.30	23.21	28.59	48.20
Commodore/Lexcen	27.00	27.35	45.65	21.89	32.82	45.29
Camry/Apollo	42.48	20.12	37.40	44.68	15.36	39.96
Corolla/Nova	39.84	26.56	33.60	48.96	23.38	27.65
Magna/Verada	28.06	23.44	48.50	30.87	14.30	54.83

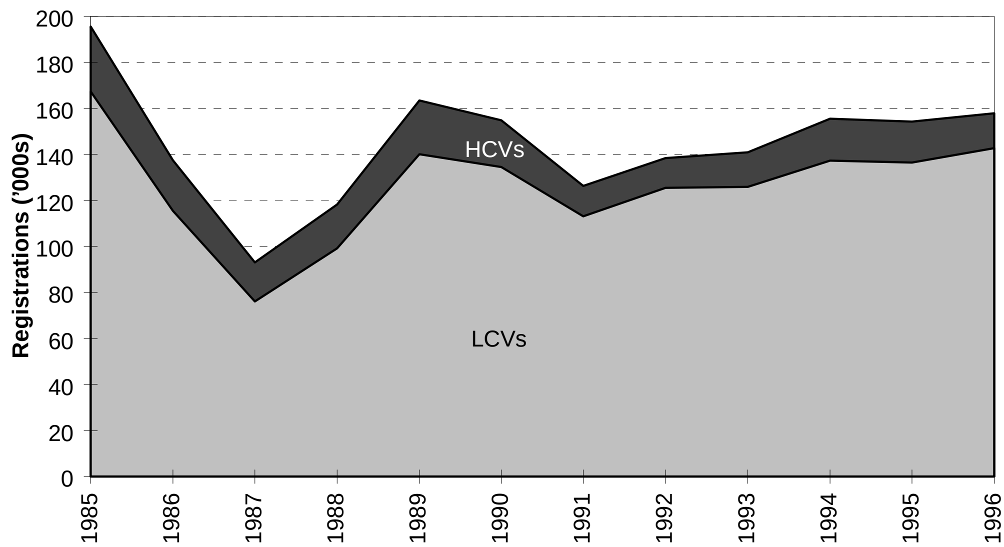
Source: VFACTS.

The only locally produced small car also relies heavily on fleet sales. Over 50 per cent of 1995 and 1996 Corolla sales were to Government or private fleets. This is exceptional within a market segment dominated by private purchasers. In 1995 and 1996 less than 19 per cent of imported small car sales went to fleets.

D.3 Commercial Vehicle market

Almost 158 000 commercial vehicles were sold in 1996. Figure D.6 presents registrations for commercial vehicles from 1985 to 1996.

Figure D.6: **Registrations of commercial vehicles, 1985 to 1996**



Sources: PAXUS and VFACTS.

D.3.1 Light commercial vehicles

Sales of light commercial and four-wheel drive vehicles totalled around 142 800 units in 1996, compared to 136 400 units in the previous year, and more than 167 400 units for the historical peak in 1985.

Light commercial vehicles (LCVs) accounted for over 90 per cent of commercial vehicle sales in 1996. Locally produced LCVs — the Commodore utility and Falcon utility and panel van — accounted for about 13 per cent of sales in this period. Most locally manufactured LCVs are utilities. Falcon vans represent about one per cent of this class.

All segments of the LCV market are dominated by imported vehicles. Over the period 1985 to 1996, four wheel drive (4WD) vehicles, of which recreational 4WD vehicles make up a significant portion, have been increasingly popular.[2] The number of sales of these vehicles has risen from about 67 000 units to almost 82 000 units — an increase in share from 40 per cent to 57 per cent of LCVs in just 10 years (see Table D.3). No 4WD vehicles are manufactured locally. This growth is consistent with trends observed in overseas markets such as the US and Canada.

Table D.3: **Registrations of light commercial vehicles, 1985 to 1995**

	Local	*4WD Imports*		*Other*	***Total***
		ATWs[a]	*PU/CC 4x4*[b]		
1985	12 657	67 674		87 075	**167 406**
1986	10 652	45 207		59 538	**115 397**
1987	10 362	29 366		36 325	**76 053**
1988	12 841	44 610		41 722	**99 173**
1989	12 340	68 662		59 058	**140 060**
1990	11 579	66 329		56 622	**134 530**
1991	8 252	58 387		46 515	**113 154**
1992	8 155	71 903		45 369	**125 427**
1993	10 261	44 643	31 097	39 977	**125 978**
1994	14 141	43 778	32 796	46 537	**137 252**
1995	16 056	45 706	29 959	44 728	**136 449**
1996	18 380	50 269	31 454	42 727	**142 830**

a All terrain wagons, recreational 4WD vehicles.
b Pick up/cab chassis 4WD vehicles.
Source: PAXUS and VFACTS.

2 In 1996 the VFACTS all terrain wagons segment, which is almost exclusively recreational 4WD vehicles, made up 62 per cent of 4WD vehicles sold in Australia. This segment was not separated out before 1993.

E LABOUR PRODUCTIVITY AT THE FIRM LEVEL

E.1 Introduction

For this inquiry, productivity is the most important measure of performance. This is because producing more outputs with the same quantity of inputs, or the same outputs with less inputs, is the key to improving competitiveness while maintaining or improving wage rates in the industry. The importance of productivity growth is widely understood, but it is apparent that few firms in the automotive industry are taking a comprehensive approach to measuring productivity. Measuring all of the inputs, and all of the outputs on a consistent basis can be difficult.

On the other hand, partial productivity estimates such as labour productivity are widely used in the automotive industry to indicate changes in performance. The advantage of labour productivity is that, in its most commonly expressed form of output per unit of labour, it is easy to calculate. It can also provide some basis for comparing the performance of a firm over time or for benchmarking the performance of like firms. However, like other partial measures, labour productivity may inadvertently measure changes in output and decreases in labour brought about by differences in the use of other inputs, such as capital and intermediate goods and services. This can be an important issue in the automotive industry where, for example, investment in robotics and other equipment can substitute for the use of labour.

With these caveats in mind this appendix provides information on the labour productivity performance of the three of the four PMV producers — Holden, Ford and Toyota. Mitsubishi did not provide specific information on labour productivity. The appendix also presents some mostly qualitative information on productivity performance of firms in the component sector.

E.2 Labour productivity of the individual PMV producers

Some of the most reliable estimates of labour productivity in the automotive industry are those calculated by the International Motor Vehicle Program (IMVP) conducted by the Massachusetts Institute of Technology. The IMVP have undertaken surveys of assembly plants around the world and measure the time taken to assemble a standard car.[1]

Like any partial measure, the IMVP approach is susceptible to differences between plants in the capital intensity of assembly (for instance, through the degree of automation of body welding). But by trying to account for differences in the type and complexity of vehicles being assembled, more reliable comparisons can be made.

Through the Automotive Industry Authority (AIA), the IMVP surveyed Australian vehicle assembly plants over the period 1988 to 1993 (AIA 1993). International comparisons are available for 1988 and 1993 but not the years in between. To obtain more up to date information the Commission approached all four PMV producers with invitations to re-run the IMVP survey. Holden agreed to participate unconditionally, and Toyota agreed to participate but only if the other PMV producers also participated. However, Ford and Mitsubishi did not agree to the proposal, and the Commission decided not to proceed.

Unable to use the IMVP approach to measure productivity, the Commission was obliged to use readily available information. Some information was supplied by the PMV producers to support claims that labour productivity has improved and further improvement is expected. Ford, Toyota and Holden all supplied estimates of labour productivity but, because they have used different methods of measurement, cross sectional comparisons are not possible.

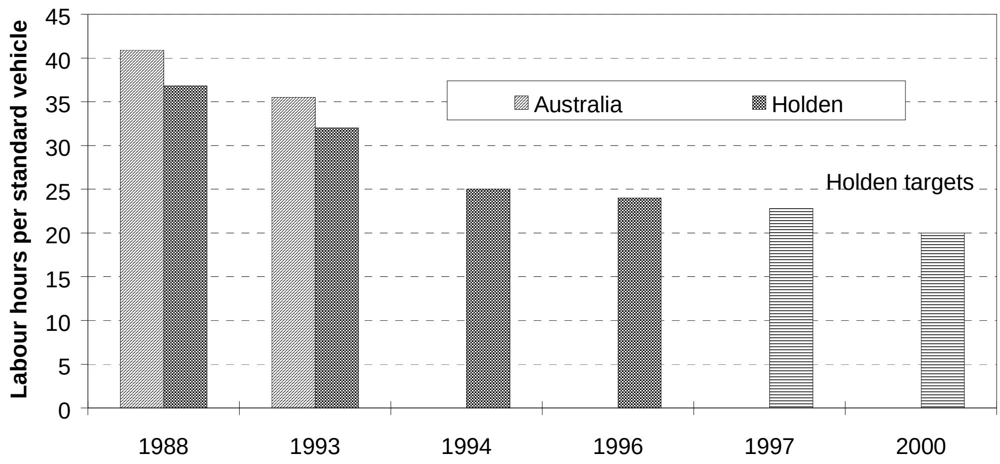
E.2.2 Holden

Holden has been measuring labour productivity using methods similar to the IMVP approach. They have noted that their productivity has improved considerably since the first time it was measured in 1988 and that further gains are expected as investment in new models and plant and equipment take effect (see Figure E.1).

Figure E.1: **Holden and industry productivity**

1 The IMVP have defined productivity as:

> ... the hours of actual working effort required to complete a group of designated assembly plant ‘standard activities’ on a product standardised by size, option content, and product manufacturability (sic) in the welding and painting areas. These adjustments do take into account differing levels of vertical integration, worker relief periods, and absenteeism. No adjustments are made for differing levels of automation, plant scale, or assembly area manufacturability. (Krafcik and MacDuffie 1989, pp. 3–4))



Source: AIA 1993, Holden (sub. 19, p. 33).

Holden said that their actual and projected productivity levels are highly competitive in a world context.

> Through the period of progressive implementation of the Holden Production System productivity performance has been significantly positive. MIT hours per car have improved from the 36.8 hours we recorded at the time of the first IMVP survey in 1988. Recent figures have been measured internally by ourselves using the MIT methodology, and should be close to what the IMVP will find if they conduct a survey this year. According to our analysis we are now at 24 hours per car. We expect to introduce the VT model next year at 22.8 hours, and gradually improve that to 20 hours in the year 2000. Certainly high volume plants in Japan are doing significantly better than that, but comparisons within the GM world currently put Holden in the best third of international plants. All of the plants with higher productivity than Holden have much higher volume. (sub. 19, p. 33)

At the Commission's request, Holden provided information on the labour productivity of the 25 General Motors Corporation (GM) plants covered in their 'International League Table'. In terms of hours per standard vehicle, that information revealed that the best plant was measured at 20.2 hours, the worst at 74.9 hours, and the average was 36.6 hours. At 24 hours, Holden's current performance is high by these standards. As Holden have stressed above, all of the plants that had better labour productivity than the Elizabeth plant are producing much higher volumes of vehicles.

In relation to their claim about improvements in labour productivity in the past few years, Holden stated that:

> It would be wrong to attribute these to any one specific cause: many factors operate concurrently to generate these changes. These factors cover capital equipment

> improvements including increased automation, improved product design for manufacturing, improved production methodologies, as well as labour market issues.
>
> Similarly, it would be incorrect to say that any single labour market issue (legislative changes, enterprise bargaining, the training reform agenda, improved work force relations or targeted employee selection techniques) contributed to the improvements. Again, the changes have operated in parallel, together with the manufacturing system improvements mentioned previously, to contribute to the overall improvements in internal productivity. It is also true to say that similar effects have operated in the component supplier sector.
>
> One consequence of these concurrent developments is that, in most instances, it is impossible to quantify the benefits obtained from any one single factor. This conclusion applies even in the case of a new piece of capital equipment where incremental benefits could be expected to be quantified easily. An example is the utilisation of transfer presses in the Holden Elizabeth plant. Expected outputs from these presses are quantifiable in parts per hour which may be compared with the output from the traditional type of press line. A number of other initiatives, however, have combined to increase the overall output and efficiency of these presses. Enterprise bargaining agreements have included shift work provisions which provide for extended utilisation of the equipment, product design changes have led to improved efficiency through the presses, and work force training has also contributed to efficiency and quality improvements. (sub. 19, p. 37)

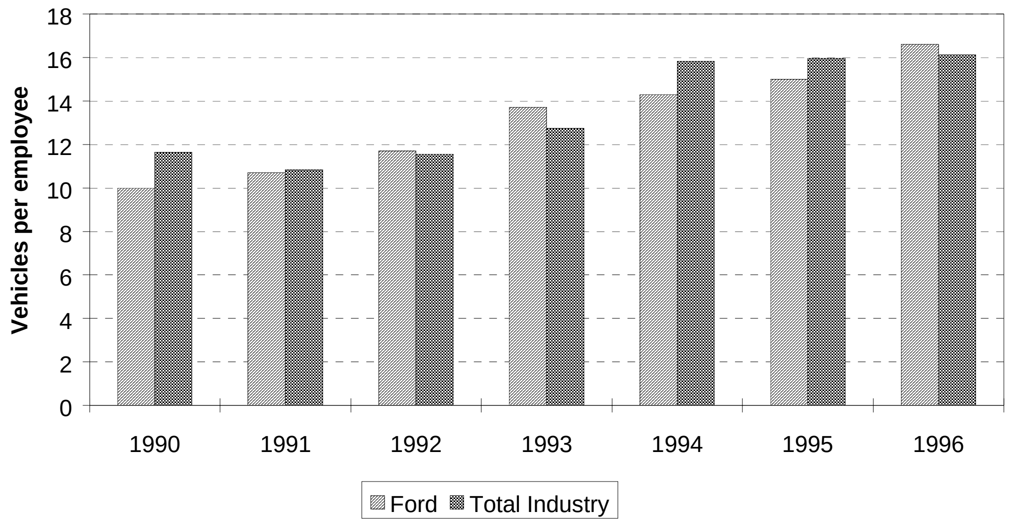
E.2.2 Ford

Ford provided the Commission with the figures on vehicles produced per employee for the period 1990 to 1996. These show that Ford's labour productivity at first grew faster than the industry average, and was higher than that average in 1993. Ford's labour productivity then fell behind the industry average in 1994 and 1995. In 1996 there was little change in the industry average, but Ford's labour productivity improved (see Figure E.2).

During the public hearings, Ford summarised their achievements in improving labour productivity:

> Anecdotally I'd like to tell people that we manned ourselves to build 250 cars a day back in 1991. We now build 460 a day and we don't employ any more people. I think that's productivity. (PHtrans., p. 283)

Figure E.2: **Ford and industry productivity**



Source: AIA (1995) and Ford (subs. 14 and 107).

In their second submission Ford supplied figures on vehicles produced per employee per year and the labour hours required to build a vehicle:

> From a manufacturing perspective, improvements in productivity can be measured empirically by the number of vehicles produced per employee. This has improved from 10 in 1990 to 16.6 in 1996 - a significant improvement. In addition the hours to assemble a Falcon were 24.7 in 1996. This puts Ford on a par with Holden in Australia whose assembly hours per vehicle are quoted at 24 in Appendix D (page 4), and Toyota for Camry, also at 24 hours in their Altona Plant.
>
> This figure also puts Holden in the best third in the GM world and they plan to be at world best, 20 hours by 2000. Ford also plans further improvements this year following assembly system upgrades during January and also with the future commissioning of the $85 million state-of-the-art paint facility. The fact that Ford and GM's Australian plants rank so highly given their scale impediment, is indicative of the progress that has been made in recent years.
>
> By way of international comparison, Ford worldwide produced 19 vehicles per employee in 1995 versus 15 in Australia. Ford and GM Australian car plants produce around 100,000 vehicles per annum versus 200–300,000 in the majority of North American and European plants, and hence suffer a significant scale impediment. The productivity gap that remains to overseas plants is essentially capital related — that is, by ramping up automation levels at the expense of labour, total productivity would rise — but at a cost that is presently unsustainable given local volumes. (sub. 107, pp. 27-28)

While these figures indicate that Ford is approximately as productive as Holden or Toyota, the methods used by each producer may differ, and hence comparisons between firms are indicative only.

Ford explained and qualified the productivity improvements they have achieved in recent years:

> Productivity has improved 40 per cent since 1991. Improvements have been driven largely by better processes, training, education and investments in cost efficient technology and far closer linkages between Product Development and Manufacturing. However, the most meaningful measure of productivity is the actual accounted cost to produce a car with investment efficiency being equally important as people productivity. (sub. 14, p. 2.2)

According to Ford, the productivity levels they have achieved mean they are now close to being internationally competitive in producing the type of vehicle they specialise in, that is the Falcon range of vehicles. Ford claimed that competitiveness:

> ... depends on the size of vehicle you’re talking of. If you take a Falcon or a Commodore-sized vehicle, we’re very close to being internationally competitive now in cost, and certainly with the cost targets we have for the next 3 or 4 years, which we believe we have every chance of achieving, we will come very close to being a competitively costed vehicle — for a vehicle of that size. That’s based on us being able to do about a hundred thousand vehicles a year. We need that volume base to be able to achieve the cost targets that we have in place. (PHtrans., p. 266)

However, in Ford’s view economies of scale are such that they will have difficulty matching world best levels of productivity, and further gains are going to be difficult to achieve. They claimed that:

> In terms of productivity, we will always be a way from the world best productivity outcome in terms of scale. When you’re producing a hundred thousand cars a year you’re never going to be able to get the economies of scale that you would get if you produced 250 or 300 thousand cars a year. However within that, in terms of labour productivity, we believe we are very close to world’s best currently. There are still some issues where we are apart; we believe ... we’ve made a lot of the easier gains in the last 5 or 6 years. The gains from here-on in will be harder to achieve. (PHtrans., p. 270)

Ford did acknowledge that in terms of labour productivity:

> There are still some gains to be made and there are some issues that we’re identifying in terms of labour productivity to try and get Ford to world’s best practice. (PHtrans., p. 271)

Ford also said that:

> In terms of capital productivity, I think as has already been said we’re never going to get the level of capital productivity on a run of a hundred thousand that you’re going to get on 250 or 300 thousand, and there’s a trade-off there between labour and capital.

> Now, with the cost of money coming down and the cost of technology coming down, we'll certainly be able to get more robotisation and automation into the plant, but there comes a point where you can't trade them off to the nth degree, there will still be some excess of labour compared to a plant that's got, say, 250 or 300 thousand (vehicles), but we have undertaken some capital productivity improvements in recent times. ...
>
> So in those two areas of labour and capital productivity we believe we're close. In terms of management practice, we think we're pretty well there, but the one impediment that will stop us getting to world's best practice is scale. (PHtrans., p. 271)

E.2.3 Toyota

Toyota provided figures on labour productivity in constructing their Camry model (see Figure E.3). A steady improvement in productivity is evident up to 1994.

Figure E.3: **Toyota productivity for Camry, 1990 to 1996[a]**

a Note that 1995 and 1996 figures include additional functions

Source: Toyota (sub. 15).

Toyota changed the basis of their measurement in 1995 by including extra functions. This appears to have caused a decline in measured productivity in 1995, but the fact that productivity recovered in 1996 indicates that underlying improvements have occurred. Toyota acknowledge that part of the improvement in labour productivity is attributable to increasing automation in their assembly plant (sub. 15, p. 11).

Toyota stated that:

> ... the number of manhours required to assemble a Camry has fallen from about 32 in 1990 to 24 in 1996. The target is to reduce the manhours to 21 hours.
>
> The gains in productivity reflected in this measure represent the outcome of a complex [set] of factors which include:
>
> - investment
> - plant rationalisation
> - new product and manufacturing technologies
> - human resources management policies
>
> It is not possible to make a precise allocation of the relative importance of these factors. There is, in practice, a high degree of interdependence between the elements of the strategies being implemented to increase efficiency, improve quality and lower costs. This situation is not unique to the automotive industry. (sub. 106, p. 2)

Toyota's investment in a new assembly plant and greater automation in the assembly process have assisted them to improve labour productivity. They stated that:

> At the time the new Camry model was introduced in early 1993, the percentage of spot welding that was automated increased from about 20% to about 50%. Similarly, following the introduction of the new Corolla model in mid 1994, automation of spot welding increased to about 65%. The level of automation is determined by a number of quality, safety and economic factors, with the volume of production being particularly important. High volume plants overseas have automated over 90% of spot welding and some have also automated substantial parts of the final car assembly process.
>
> The higher levels of automation have increased labour productivity and been essential to meeting the quality requirements in important areas such as body rigidity. However, higher automation has come at a cost in terms of greater capital investment which must be amortised over the number of cars produced. (sub. 15, p. 11)

Toyota argued that an influence that is retarding their achievement of greater productivity is their need to produce variants of the Camry for different export markets. They have explained that:

> The additional complexity that must be coped with in order to produce exports for a number of markets with differing product regulation requirements puts a brake on achieving productivity gains and reduces the potential gains from economies of scale. (sub. 106, p. 16)

Toyota believe reforms in the labour market will assist them to further improve productivity. They stated that:

> ... part of the remaining gap in its productivity compared to Toyota's operations in Japan, the United States and the United Kingdom is due to the labour market environment and conditions. Whilst this is a major focus for improvement, gains will

> be slow and we will continue to lag behind TMC's other overseas operations. Australia needs a truly competitive labour market to support a competitive local car industry. (sub. 15, p. 41)

E.2.4 Summary of productivity influences in the PMV sector

The information supplied by Toyota, Ford and Holden indicated that substantial improvements in labour productivity have occurred in recent years. However, the Commission did not have access to the raw data from which this information was derived, and hence was unable to verify that the numbers are correct. Nevertheless the following qualitative themes emerge from the evidence they have submitted:

- the improvement in labour productivity has been influenced by many things, including capital investment, attention to production systems, labour relations, training and supplier relations among others;
- some capital investments have improved both labour productivity and the quality of vehicles produced;
- there is still a gap between Australian levels of productivity and world's best practice;
- all PMV producers (Mitsubishi included) believe that further gains will be difficult to make; and
- bridging the gap will require the adoption of world best practice in terms of management and labour practices and greater production volumes to benefit from economies of scale.

E.3 Productivity of firms in the component sector

The evidence on productivity in the component sector is much more qualitative than it is for the vehicle assembly sector. Little quantitative evidence was supplied by component firms, and some evidence was only supplied on a confidential basis. The general impression from most firms was that they had made substantial improvements in terms of labour productivity, but it is not known how total factor productivity may have changed.

Quantitative estimates of labour productivity were supplied by some firms. For instance:

- Air International claims to have doubled sales per employee over the last five to six years (sub. 37, p. 11); and

- Denso have improved output per worker by almost eight per cent a year in real terms over the period 1987 to 1996 (information obtained from industry visit).

Hella, Bendix Mintex, South Pacific Tyres and National Consolidated were among other firms who claimed to have improved productivity in recent years.

By virtue of their linkages with parent or affiliated companies operating in other countries, some firms are able to benchmark their performance in the international arena. For example, South Pacific Tyres said that since its formation (in 1987):

> ... world productivity has risen by an impressive 6 per cent per year and we are proud of our average gain of over 7 per cent per annum. (sub. 57, p. 5)

Bendix Mintex, a manufacturer of brake linings for original equipment and the aftermarket, have also benchmarked their performance internationally:

> Bendix Mintex has achieved continuous improvement in productivity in a quest to increase efficiency and maintain a competitive offer in the market place. Bendix's results are equivalent to World Best Practice and have achieved additional domestic and international OE business. These results are encouraging when viewed in comparison to equivalent friction manufacturing companies, but when compared to low cost SE Asian producers not subject to the same work practices in quality, HS&E, wage conditions and Government charges, Bendix Mintex's is not competitive. (sub. 72, p. 11)

Pilkington Australia, a supplier of glass to the automotive industry, and one of many subsidiaries within Pilkington plc has also been able to benchmark their performance:

> We benchmark every Pilkington plant around the world and we benchmark the key components - productivity, process yields and quality, along with a couple of other associated areas. We sit in the second quartile except in quality (where) we sit in the top of the top quartile, measured in PPMs (parts per millions). We are improving significantly in productivity. We have moved in the last 3 years from the middle of the field to the lower half of the top of the field. (PHtrans., p. 402)

Component producers have pursued improvements in productivity partly to meet their customer's cost down requirements. For example, BTR Engineering stated that their productivity has to be high:

> ... to cope with market pressures. Customers for most of its product range face their own competitive pressures, and have the option of sourcing these major components overseas from high volume or in-house producers, creating significant pressure to reduce prices beyond normal productivity. (sub. 53, p. 9)

They also commented that:

> Already, price pressures exceed realistic productivity gains. (sub. 53, p. 2)

Similarly Pilkington argued that:

> We are approaching the point where productivity gains alone will not achieve the cost-downs demanded by the automakers. Therefore we are looking to lower costs in energy (particularly electricity), freight and taxes, to enable us to continue to remain competitive. (sub. 50, p. 3)

National Consolidated also commented on the pressures their car making customers place on them:

> Manufacturers now seek to share the benefit of expected increasing efficiencies and productivity gains over the production life of a part by requiring the price of a component to reduce over the life of a contract. (sub. 38, p. 12)

The degree to which component manufacturers can react to cost down pressures on their output prices will depend on how much influence they can have on their own costs. As noted in Chapter four, there was considerable frustration with raw material pricing and supply issues. For example, National Consolidated stated that:

> Component producers can with investment, skill and commitment, achieve significant efficiency and productivity gains in areas where they exercise control (eg, design of factory layout, organisation of labour, production scheduling). As described elsewhere in this submission, the three NCL automotive operations have made significant productivity gains in this way.
>
> Yet, it must also be appreciated that there are cost areas which to a large extent have proved to be beyond the scope of a component producer to control. The cost of raw materials is such an area.
>
> Despite strenuous efforts, producers have found it very difficult to achieve any significant reductions in that cost area. (sub. 38, p. 12)

Like the vehicle producers, most component producers claimed that the easy gains had already been made and that further gains will be increasingly difficult to make. Attaining economies of scale and further labour market reform were seen by some to be important.

For instance, Hella stated that:

> ... labour productivity must be increased by further improving flexible work practices. Those work practices must include the complete abolition of rostered days off and the acceptance of staggered working hours. After achieving major productivity improvements it becomes much more difficult to make further gains. (sub. 11, p. 30)

and

> In terms of capital productivity, I’m sure we all understand we talk about volume at the end of the day, and I mentioned before, for our business we have to make certain investment to serve the local market, regardless of what the size of the market is — also in terms of, for example, test equipment and these type of things. So saying this, we

will see an improvement in this field only if we are able to increase our volume —for example with export. (RTtrans., p. 355-6)

F AUTOMOTIVE TECHNOLOGY, RESEARCH AND DEVELOPMENT

F.1 Introduction

Automotive firms need technology to make vehicles and components. Simply defined, technology is no more or less than scientific or engineering knowledge useful in manufacturing.

Firms need to obtain technology, appropriate to their circumstances, to make new and better products, and to develop more productive processes for making existing products. They can do this in two ways. They can purchase technology, or they can invest in research and development (R&D). In practice most automotive firms do both. However, the Australian automotive industry has traditionally relied heavily on imported technology. This is partly because most firms can obtain technology at relatively low cost from overseas. With many multinationals present in the industry, local subsidiaries often have a heavy dependence on their parent's technology.

The relatively small size of the Australian industry, and difficulties in achieving the high volumes needed for economies of scale, gives special emphasis to process R&D (developing better processes) as a means of improving productivity. However, several firms in Australia have demonstrated their technical innovation in product R&D (developing new or better products) as well (see Box F.1). In practice product and process R&D are often conducted simultaneously in the same project.

This appendix looks at the R&D performance of the Australian automotive industry, the strategic importance of R&D as a competitive edge in world markets, and the links between R&D and design. The role of Australia as a design and R&D base is also examined. The appendix concludes with an examination of the current R&D infrastructure.

Box F.1 **Product and process R&D**

In the automotive industry, R&D comprises a wide range of activities. In terms of product R&D it can start with design, and include material selection, prototype construction, testing and preparing for manufacturing. An example of a product based project is the design and development of a unique parking brake (the Banksia brake) developed by PBR automotive (see Business Victoria, 1996).

R&D aimed at improving industry processes is important in the Australian context, where the limited scale of manufacture places a premium on technical efficiency. If Australian firms are to succeed with an inherent scale disadvantage they need to concentrate on improving efficiency of their manufacturing processes. Examples of projects that are or could be important to the Australian industry include research being undertaken by the Centre for Alloy Solidification Technology, in conjunction with industry participants, into light metals casting (see below), and process technology to control material flow in plastics injection processes.

F.2 Business expenditure on R&D

Business expenditure on R&D (BERD) can be an important means for firms to obtain a competitive edge. But the inability for private individuals to know the extent of the benefits that they may generate, or to be able to capture all of those benefits, suggest that they may under-invest in R&D. This creates a role for Governments to supplement the processes of knowledge creation and increase the returns to the wider community.

Australia is a middle ranking country in terms of investment in R&D when measured as a proportion of GDP, but this has been growing strongly in recent years. Australia’s R&D performance has also been characterised by high public expenditure relative to private expenditure. But BERD has been growing on average by about 13 per cent annually, and as a proportion of GDP rose from 0.3 per cent in 1981 to 0.74 per cent in 1994–95.

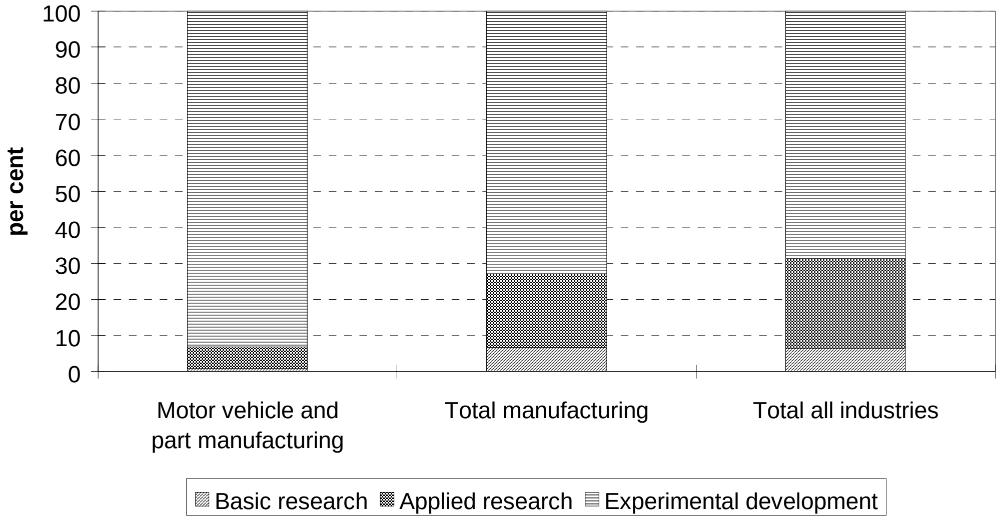
Research and development can be broken down into three broad categories or activities:

- basic research — experimental and theoretical work that is undertaken primarily to acquire new knowledge and doesn’t have a specific application;
- applied research — original work undertaken to acquire new knowledge but with a specific application in mind; and

- experimental development — systematic work which uses existing knowledge for the purpose of creating new or improved products and processes.

Relative to manufacturing in general and all industries, R&D by business enterprises in the Australian automotive industry is largely of the experimental development type (see Figure F.1).

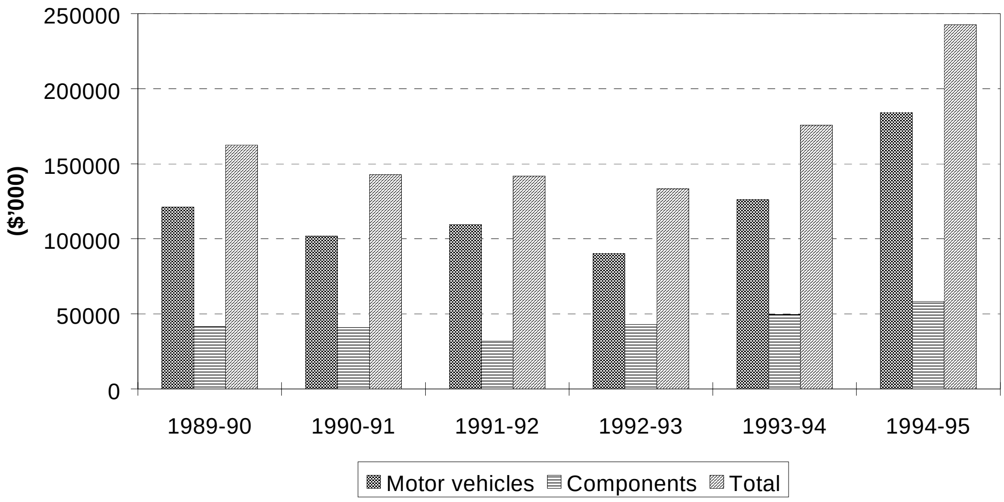
Figure F.1: **Business expenditure on R&D by activity for automotive, manufacturing and all industries, 1994–95** (proportion of sector total)



Source: ABS (1996b and unpublished data).

In recent years, BERD by the automotive industry has been cyclical, with strong growth since 1992–93. The PMV producers account for the largest part of automotive BERD (see Figure F.2). While it is possible only to speculate on the different factors that have been influencing automotive BERD, the recent upswing is likely to 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 competitors.

Figure F.2: Business expenditure on R&D by motor vehicle and component producers, 1989–90 to 1994–95 (1994–95 dollars)



Source: ABS (unpublished data).

F.2.1 R&D intensity in the automotive industry

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. In 1990–91 the automotive industry's R&D intensity was 1.28 per cent, which was the fifth highest among 17 industry sectors (Industry Commission, 1995c, p. 84). However, differences between sectors can be influenced by the technological opportunities available, the degree to which R&D can be appropriated, and market characteristics. Hence, these differences need to be interpreted carefully. R&D intensity in the automotive industry does not appear to have changed much over time. In 1984–85 it was 1.25 per cent, and in 1992–93, it was 1.24 per cent.

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 (see Table F.1). When expressed as a proportion of sales, most of the 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. All of the companies referred to in the table are diversified and also supply industries other than the automotive industry.

Table F.1: **Selected 'motor vehicle and part manufacturing' companies' expenditure on R&D, 1994-95**

Company	*R&D Exp.*	*R&D/Sales*	*R&D/Profit*	*R&D/emp.*
	$ m	*%*	*%*	*$*
BTR Nylex Ltd.	53.80	0.81	6.31	1657
Pacific Dunlop Ltd	13.93	0.20	3.19	282
Pacific BBA Ltd	8.30	1.92	28.07	3193
Futuris Corp. Ltd.	1.98	0.61	7.45	1470
National Consolidated Ltd.	1.25	0.59	8.64	455
Bridgestone Australia Ltd.	0.69	0.17	2.65	305
All firms	**79.95**	**0.53**	**5.77**	**880**

Source: Coopers and Lybrand 1995.

Some participants supplied particular information on their expenditure on R&D. For example, Robert Bosch stated that it has:

> ... consistently spent approximately 7% of turnover from local manufacturing on Research and Product Development. Since 1990 this translates to investment of 67 million dollars in Research and Development activities. (sub. 65, p. 3)

F.2.2 Regional commitments to R&D by businesses

Business expenditure on R&D by vehicle and component suppliers is regionally concentrated in Victoria (see Table F.2). Data for South Australia are not available but it is apparent from the expenditures in other states that, at the most, 16.1 per cent of automotive BERD occurred in South Australia. This is a reflection of the fact that the headquarters of Ford, Holden, and Toyota are located in Melbourne, while most of the first tier component producers are also located in Victoria.

F.3 Strategic importance of R&D

The global development of the automotive industry is placing increasing pressure on component suppliers to have the necessary technology to design and develop components. The increasing complexity of modern vehicles, and the tendency by car makers to outsource the manufacture of complete sub-systems and concentrate their own efforts on the overall vehicle design and its subsequent assembly are important developments. As Wells and Rawlinson (1994) observe:

Table F.2: **Location of R&D Expenditures by Business Enterprises, 1994–95**

	Motor vehicle and part manufacturing[a]		*Total manufacturing*		*Total all industries*	
	$'000	*%*	*$'000*	*%*	*$'000*	*%*
NSW	11275	4.6	651378	33.8	1247282	36.9
Vic	190843	77.7	786190	40.8	1258441	37.2
Qld	3317	1.4	126723	6.6	258014	7.6
SA	np	np	165529	8.6	204410	6.0
WA	np	np	143846	7.5	325844	9.6
Other States and Territories	415	0.2	36835	1.9	65813	1.9
Overseas	np	0.0	18130	0.9	23321	0.7
Total	**245567**	**100.0**	**1928629**	**100.0**	**3383125**	**100.0**

np not provided.
a Motor vehicle and part manufacturing covers ANZSIC codes 2811, 2813 and 2819.
Source: ABS (unpublished information, and 1996b).

> Each leap in technology requires a larger market over which to amortise the development costs, and this is driving the process of industrial concentration allied with the spatial extension of the market. (p. 195)

In line with international developments all the PMV manufacturers have been rationalising their component supply base. Ford note that the tendency to:

> ... "black box" or "systems" supply where the supplier delivers a complete component or system direct to the manufacturer rather than a variety of smaller unassembled components... [requires] ... increases in capital, technology and skill levels for suppliers ... (sub. 14, p. 3.6)

These developments are creating particular challenges for Australian component producers, who are required to access and use competitive technologies.

The Australian automotive industry is a net purchaser of 'technical know how'. Unpublished data supplied to the Commission from the ABS shows that in 1994–95 payments by firms for patent licence fees, royalties and other forms of technical know how were just over $91 million, of which around $83 million was by motor vehicle manufacturers. The ABS does not provide total figures for how much was received by automotive firms generally for 'technical know-how', but the indications are that it is relatively little.[1] What is known is that

[1] Receipts for the larger 'Motor vehicle and parts and other transport equipment' category, which includes ships, trains and other non-automotive classifications were $11.8 million, indicating that receipts for 'motor vehicle and parts manufacturers' must be less than or equal to this amount.

motor vehicle manufacturers are recorded as receiving no payments for ‘technical know-how’ in 1994–95.[2]

The alternative route of obtaining technology — that of developing it in-house — can be an important springboard into the world market. The view of many participants is that it is crucial in becoming competitive in the world market. For instance, FAPM stated that:

> Product and process innovation will be critical factors in the future success of the Australian component industry. FAPM members have identified Research and Development (R&D) as an important facilitator of growth. (sub. 48, p. 36)

In advocating R&D as one of the six ‘cornerstones’ for the future development of the automotive industry FAPM said:

> Proprietary technology is a key determinant of competitive advantage. This applies to both product and process technologies.
>
> As the component sourcing of the world’s vehicle producers become increasingly global, unique proprietary technology increases in significance. (sub. 48, p. 41)

FAPM’s survey of members indicates that larger firms involved in exporting identified technology as a very significant factor in helping to facilitate exports. For firms that did not export, technology was not ranked as a significant factor in firm development (sub. 48, p. 36).

The development and control of technology is an important basis for the growth of many firms. Development of products and processes that give firms a competitive edge in world markets may initially result in exports from Australia. But if these grow enough it can become worthwhile for firms to invest in manufacturing facilities in the target market itself. This may also be necessary to meet customer’s needs for just-in-time (JIT) delivery, and can sometimes be a condition of supply. In these circumstances many Australian automotive firms are strengthening their R&D capability.

The evolution of Australian companies into global suppliers, and their approach to investing in R&D, differs across the range of companies present in Australia. While Australian owned firms such as Air International spend a relatively large part of their budget on R&D, many multinational firms can access and adapt technology from parent companies. Nevertheless, many of these companies are now using their Australian operations as a regional base for servicing the technology, and in some cases component supply requirements, of related subsidiaries in other countries. Hella Australia is an example of a firm that now

2 Receipts for technical know how are an important feature for some firms in the automotive industry. For instance, AE Bishop earns 90 per cent of their income from overseas, a substantial proportion of which comes from royalties.

acts as a regional headquarters for an organisation that makes like products in many locations around the world.

In other cases local component suppliers are parts of large, diversified, multinational conglomerates, but have developed a substantial expertise in a particular product area that may not be replicated elsewhere in the group. Britax Rainsford and BTR Nylex are examples of these. 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.

In addition, some independent Australian firms supply design and R&D services from Australia into world markets. These include firms such as Orbital Engine Corporation, Millard Design Australia (part of Venture Asia Pacific), and AE Bishop and Associates (see Box F.2).

Box F.2: **Export of R&D services**

Australian firms involved in the export of R&D services include Orbital Engine Corp. (Orbital), Millard Design Australia (Millard), and AE Bishop and Associates (Bishop).

Orbital and Millard are both involved in the development of an Indonesian national car, the Maleo. Orbital's 1.2 litre, three cylinder, two stroke engine, which uses the company's patented direct injection system, has been chosen to power the car. Orbital Engine Company has been negotiating with the Indonesian Government since mid 1995 with a view to forming a consortium to manufacture the engine in Indonesia. Orbital's Australian operations stand to benefit from the development of the engine in this new application, and from royalty revenues on their technology. The development of the Maleo has been undertaken by a team headed by Millard and Indonesia's 'agency for strategic industries'. Millard was responsible for the general development of the Maleo. The Maleo is due to go into production in 1998. (Wards, October 1996, p.3)

Bishop is a firm that designs components and systems, engineers these products such that they are ready for commercial manufacture, designs machine tools to produce them, and sells the component and production technology under licence to manufacturers in Europe, Japan, the USA, Australia, South Korea and Brazil. It currently has over 500 patents and patent applications on products, process methods and machinery internationally. (sub. 16).

These approaches contrast with the approach taken by Bridgestone Australia Ltd. who closed their R&D operations in Australia and now import all of their technology.

F.4 Vehicle design and R&D

The degree of local design content of Australian made vehicles has been argued by some participants to have important implications for the technological capability, and hence competitiveness, of Australian based component suppliers. The importance of Australian designed vehicles was emphasised by Venture Plastics who said:

> With the strength in development capabilities of our supply base, GMHA and Ford must continue to develop cars in Australia and be a world leader in the development of low volume, fast to market vehicles for niche markets. (sub. 8, p. 8)

At the other extreme, a standard international design such as Toyota's Camry model requires substantially less Australian based product design and development skills, either within the assembler or its component suppliers. Suppliers to such vehicles are often expected to enter licence agreements or form joint ventures with the traditional suppliers of the parent car company. In discussing why they import some components and not others, Toyota made the point that:

> ... some components have been developed by TMC's first tier suppliers in Japan and to date no local suppliers have been able to effectively clone the techniques involved. (sub. 15, p. 26)

The use or adaptation of an overseas vehicle design for the vehicles manufactured in Australia is a matter of careful judgement for the PMV producers. It is much less expensive than developing a vehicle from scratch, but must be judged against the market's perceived needs, and export potential for uniquely developed Australian designs. At the global level many vehicle makers are attempting to cut costs but still cater to the diverse preferences of different markets by producing variants from a smaller number of vehicle platforms. General Motors Corporation for instance plans to decrease the number of platforms it uses from 16 models in 1991 by early next century (Smith 1996-97). This has implications for the models produced in Australia by Holden, but as Holden stated:

> It is true that GM is becoming more global and we're seeing evidence of this in many, many dimensions and here is another one. I'm happy to report to you that the Vectra and the Commodore platform configuration is a comfortable fit with that long-term projection. (PHtrans., p. 438)

For the component sector, the use of international vehicle designs is changing the way they do business. BTR Automotive Engineering commented that:

> There is little design content left in the Australian car assembly industry. Thus, R & D and manufacturing functions are becoming disjointed. (sub. 53, p. 10)

Some participants mentioned the need to be present in the design headquarters of their customers to compete effectively for supply contracts. For example PBR automotive said:

> ... the successful component manufacturers who will be operating in Australia have to have the option — or have to have the ability to be part of the vehicle platform design which is most likely to occur in the centres of the world such as Detroit and Tokyo and Frankfurt. (RTtrans., pp. 30–31)

Air International also claimed that the globalisation of automotive design increases the costs of meeting customers requirements and places Australian firms at a disadvantage:

> The move to global vehicle design means that, to conduct business in Australia, component producers are required to situate resident engineers at the design source. This imposes additional cost burdens in comparison to other Australian industries. (sub. 37, p. 8)

Although the loss of Australian design content may affect the competitiveness of local component suppliers it is a natural result of the way the international vehicle industry is developing and there is little that governments can do about it. When the Commission last examined the automotive industry it concluded that there did not appear to be any specific impediments subject to the influence of Governments, and that it would be harmful if specific measures were introduced. The Commission commented that:

> ... product design and the sourcing of technology are matters properly determined by the industry on the basis of usual commercial considerations. (IC 1990, p. 35)

F.5 Australia as an R&D and design base for the Asia Pacific region

The globalisation of design provides challenges and opportunities for the Australian automotive industry. While a lower Australian design content in locally manufactured vehicles has important implications, some participants who have developed the requisite design and development skills have moved into the global sphere. In particular, the Commission was advised by participants of the potential for Australia to build on its emerging role as a technology hub for the Asia Pacific area.

Venture argued that the Australian automotive industry has the opportunity to become the technology hub of the Asian automotive industry, but to achieve that goal Australia must:

> ... be a developer and net licenser of innovation and technology. We must also be a developer and net exporter of technical resources. We can train designers and

> engineers in Australia and through the tremendous technical advances in telecommunications over the last five years, they can design cars for the world out of Australia. Venture is already using Millard in this manner. (sub. 8, p. 8)

A good skills and technical base, cultural factors (for example, English speaking and quality of life issues), similar time zones, and a number of other factors make Australia an attractive technology base for many businesses. For example Holden, BTR Nylex, Robert Bosch, Britax Rainsford and Pacific BBA all use their Australian operations as a regional or global R&D base.

Australia's attributes as a technical base for the Asia Pacific region were mentioned by FAPM:

> The relatively small initial volume of Asia's new producers, together with unique technology requirements generally considered outside the traditional scope of suppliers in developed markets, has placed Australia and Australian-based suppliers in a potentially advantageous position.
>
> Australia has a relatively mature and capable supplier, second tier and raw material base which includes a large number of world first tier organisations. Many of these organisations have their regional base in Australia. (sub. 48, p. 28)

The potential for component firms to develop an export focus based on strengths in technology and R&D is illustrated by the case of Robert Bosch (Australia) Pty Ltd (see Box F.3).

At the vehicle makers level, Holden has established itself as a design and development centre for General Motors in the Asian region. In Holden's case considerable skills and capability have been built up from adapting overseas designs to Australian conditions. This role will be extended into adapting other GM designs to meet particular market requirements. This will include the development of variations on the Opel Astra to be built at a new plant in Thailand and exported to various countries in the region, including Australia. The design base in Australia will also act as an additional resource to be used by other GM engineering organisations.

Australia is seen by Holden as a good base for this type of activity.

> Australian design and development of passenger cars is now very competitive with overseas. When the Export Facilitation benefit is taken into account Australia becomes a relatively attractive prospect as an automotive design location. Furthermore, acceptable supporting infrastructure is locally available. At the same time the location of this capability close to the growing Asian markets makes it particularly relevant to international car companies centred in North America or Europe . Proximity, similarity of climatic conditions, and compatibility of time zone, make Australia an attractive location for a regional engineering centre to cover Asian requirements. (sub. 19, p. 23)

Box F.3: Robert Bosch (Australia) Pty Ltd (RBAU)

RBAU has adopted a strategy to expand its business into export markets and decrease its reliance on the domestic market. RBAU has explained that two additional responsibilities are driving the development of its export business.

> The first of these is the assignment to RBAU of responsibility to develop the automotive original equipment business in South East Asia on behalf of RB [Robert Bosch – the parent company]. This requires that RBAU identifies new business opportunities in the ASEAN countries, develops strategies to participate in identified markets (eg, joint ventures, licensees), negotiates agreements, establishes and supervises joint venture operations, provides technical resources and training and transfers technology.

The assignment of this role is partially in recognition of restrictions on market access to many South East Asian economies, but it also reflects the particular advantages that RBAU is perceived to have over other Bosch subsidiaries:

> Apart from being better located geographically to service the ASEAN region and in a similar time zone, RBAU has the specific advantage of a multi-cultural workforce comprising more than 40 nationalities, including engineers and tradesmen whose ethnic origins are the ASEAN countries of Thailand, Malaysia and Indonesia. These closer cultural links with South East Asia (than, for example, Germany) are a reflection of today's Australian society and are a benefit to Australia and RBAU in developing business relationships in ASEAN countries. During 1996, RBAU will commence original equipment product assembly in either joint venture or licensee operations in each of the three countries, Thailand, Malaysia and Indonesia.

The second addition to its traditional role of servicing the Australian domestic market is the granting to RBAU of the worldwide responsibility for design, development, manufacture and marketing of car body electronics on behalf of its parent.

RBAU claim that its:

> ... strength in engineering and manufacturing innovation and competence, its ability to provide design solutions in short lead times, its enhanced labour flexibility and productivity resulting from innovative Enterprise Agreements, Australia's competitiveness as a location for Research and Development, and Australia's encouragement for development of automotive exports were some of the important factors in the decision by RB to allocate this worldwide responsibility to RBAU.

While RBAU sees maintenance of its domestic base as important, the development of its role as a headquarters for the South East Asian region is expected to generate most of its future growth, and will help achieve economies of which will assist its competitiveness.

Source: sub. 65 (pp. 5–6).

In addition Holden has been given particular design and development responsibilities for General Motors products outside North America. Holden has been appointed the centre of expertise in heating, ventilation and air conditioning for GM products sold outside North America. It has also recently been made responsible for development of GM’s large rear wheel drive cars 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 2001. To support their design and development programs, Holden expects its product engineering workforce to increase from 500 to nearly 900 through the second half of their current ten year plan period (sub. 19, p. 35).

To some extent the other vehicle makers are also using their Australian operations to supply services to overseas affiliates. The cyclical nature of product development means that at times when the resources of the car makers would otherwise be underutilised they can be used to bolster the capacity of affiliated organisations.

F.6 R&D infrastructure

The performance of the automotive industry is influenced by its investment in R&D. This will be affected by many factors, including the industry’s access to, and preparedness to use, public and private R&D infrastructure.

Many firms have some R&D facilities for their own use, and are often prepared to make those services available to other (generally non-competing) firms in the industry. In addition, some firms specialise in providing R&D services to the industry. R&D services are also supplied by a range of public institutions, including the CSIRO and some universities.

To induce firms to undertake R&D, the Commonwealth Government offers assistance largely through tax concessions for eligible expenditure, support for Cooperative Research Centres (CRCs), and grants and loans through the R&D Start program. The support of universities and other research institutes such as the CSIRO is also important.

F.6.1 Tax concession

The tax concession for R&D was discussed in Chapter 4. By its nature, the tax concession is a general form of assistance which does not target any particular industry or technology. To participate in the program companies must be incorporated in Australia, and incur R&D expenditure greater than $20 000. The threshold is waived if the company incurs the expenditure by payment to relevant registered agencies such as the CSIRO.

For R&D expenditure to be eligible for the concession, the project must be based on a core activity that involves either innovation (having an appreciable degree of novelty), or high levels of technical risk (the probability of obtaining a given technical outcome cannot be known or determined in advance, and such uncertainty can only be removed through a program of systematic and investigative experimental activities). The greater part of the eligible activity must generally be carried out in Australia, it must have adequate Australian content, and its results must be exploited for the benefit of the Australian economy.

Eligible expenditure includes:

- wages, salaries and other labour costs, deductible at 125 per cent;
- qualifying expenditure on plant and pilot plant, deductible at 125 per cent over three years;
- payments for core technology used for R&D expenditure and interest, deductible at 100 per cent; and
- depreciation on buildings used for R&D (Costello, 1996).

The concession arises in two ways: first by effectively bringing forward tax deductions, and second by allowing deductions to be made at a greater than dollar for dollar rate.

The notion that the concession brings forward tax deductions arises from the idea that such expenditure broadly corresponds to investment in an income producing asset. According to this view, if the same income tax treatment was applied to R&D expenditure as to other investment expenditure, deductions would be made over a longer period, commensurate with the receipt of the benefits. Compared with such a model, the fact that some R&D expenditure can be deducted as recurrent expenditure would be a concession even at a 100 per cent rate (IC 1995c).

The tax concession is one of the most visible and used forms of generic assistance. In a survey of component suppliers and design firms, the tax concession was used by approx 75 per cent of component firms and 38 per cent of design firms. This was substantially higher than the use of any other source of funding or assistance, including competitive grants for R&D (Business Victoria, 1996).

F.6.2 Syndication

Until recently, the tax concession included syndication provisions which were initially intended to deal with large and risky projects that were beyond the resources of a single company to carry out. Eligibility was restricted to projects of $500,000 or more. Syndication worked by allowing a tax benefit transfer from the tax loss companies undertaking the R&D to syndicate partners who provided the R&D funds. The effective subsidy rates provided by syndication were estimated by the Industry Commission to be in the range of 15 per cent to 138 per cent, with an average of 60 per cent (IC 1995c).

Concessions for R&D syndicates, and the underlying partnership provisions, were abolished effective 23 July 1996 (Costello 1996).

F.6.3 R&D Start program

The R&D Start program builds on previous competitive grants (Competitive Grants for Research and Development) and loans (Commercialisation of Technological Innovation) programs, and is specifically tailored to assisting small to medium sized enterprises to undertake more R&D. The program (like its predecessors) has not been widely used in the automotive industry. An exception is the $3 million grant recently awarded to AE Bishop and Associates to assist research and development of a rotary valve system that offers the potential for better breathing and more efficient combustion in four stroke engines.

Unlike the non-targeted tax concession, the grant scheme operates on the basis of a competitive merit-based selection process. The maximum grant available is 50 per cent of total eligible project cost. The discretionary element introduces a number of administrative problems in selecting projects. The Industry Commission (1995c) has criticised the scheme for: lacking transparency; encouraging the selection of firms who were likely to be successful in any event (hence not addressing market failure); and focusing the assistance on a small number of firms, many of which have received several grants.

F.6.4 Cooperative Research Centres

The Cooperative Research Centres (CRCs) program was launched in May 1990. It aims to encourage collaborative research ventures between universities the public sector and business. The program is supported by Commonwealth and State government contributions of about $140 million a year. Industry has so far committed more than $400 million over seven years. A total of 62 CRCs currently exist across the spectrum of research fields (DIST 1996c).

There are nine CRCs in the broad area of manufacturing technologies. Two of these have some application to the automotive industry: the Centre for Alloy and Solidification Technology (CAST); and the CRC for Materials Welding and Joining.

The CAST CRC is based at the University of Queensland, and is undertaking research into light alloy casting technologies. Part of the research program is devoted to new approaches to the design of light alloy components for the automotive and other industries. A number of automotive firms are participating in particular projects, their contribution coming primarily by way of staff time and the provision of access to commercial die casting facilities.

Nissan is one of twenty companies that have formed an affiliate membership of the CAST CRC. It expressed concern about the CRC's poor commercial focus:

> Our concern is that, despite the formation of such an industry based group and the policy intent of the government in establishing the CRC process, CRCs tend to be too remote from the priorities of industry. (sub 88. p 10)

Nissan elaborated on their concern when it appeared before the Commission. It was concerned about the direction the CAST CRC was taking in developing new alloys. Nissan said that it should be addressing casting problems more relevant to 'day to day technical expertise' issues such as eliminating problems with aluminium adhesion to metal moulds (RTtrans, pp. 256-258).

F.6.5 Australian Automotive Technology Centre (AATC)

The AATC was established in 1991 with seed funding from the Victorian and Commonwealth Governments. Operating out of the CSIRO's Division of Manufacturing Technology, the AATC was set up to facilitate the uptake of available R&D services, and encourage collaborative arrangements in automotive R&D. The AATC has been heavily involved in the establishment of the CAST CRC (see above).

F.6.6 Universities

Universities can be important sources of R&D. They are often involved in fee-for-service consultancies on specific projects, and the placement of post-graduate students in firms to work on specific projects.

ARB have indicated their general endorsement of the R&D and skills base available to them in Australia.

> The existence of a strong domestic industry has fostered a number of excellent automotive research centres in Australia's leading educational institutions.
>
> This has proved of significant benefit to ARB which has undertaken co-operative developments, mainly with Monash University and also with the Queensland Institute of Technology and the Royal Melbourne Institute of Technology. (sub. 12, p. 3)

F.6.7 Other R&D Providers

A variety of organisations are providing R&D services to the automotive industry, some supported by the Commonwealth or State governments. For example, the South Australian Government pointed to the role of the Advanced Manufacturing Facility (at the South Australian Centre for Manufacturing) in enabling:

> ... the use of leading edge technologies to aid the speed and certainty by which products are designed, prototyped, tested and produced. The AMF is now complemented by the recent establishment of CAD related services and training provider Silicon Graphics at SACFM. (sub. 61, appendix 3, p. 3)

Similar services are offered in Victoria.

G OCCUPATIONAL EDUCATION AND TRAINING IN THE AUTOMOTIVE INDUSTRY

G.1 Introduction

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 national training policy; and the commitment to training demonstrated by automotive firms, unions and employees.

For employers, the major benefit of training is increased labour productivity. However, the exact relationship between training and productivity is difficult to quantify, as training is only one element affecting productivity.

Training results in benefits for automotive employees also. For example, training has helped establish identifiable career paths in the industry, linked training levels and pay rates and improved internal and external job mobility.

Participants in this inquiry were generally positive about the on-going contribution of training in the development of the automotive industry. For example, Mitsubishi stated that the benefits of training include:

> ... a more motivated workforce focused on product quality improvement with lower labour turnover, reduced absenteeism and industrial disruption and improved safety awareness. For the employee there is the self esteem associated with knowledge and skills acquisition, increased participation in decision making processes and enhanced access to a career path. (sub. 34, p. 16)

The Australian Automotive Aftermarket Association identified some of the benefits linked to training and its on-going role:

> There is evidence of improved productivity and job satisfaction resulting from increased autonomy and empowerment of the capabilities of the workforce and we believe further benefits will be found through continuing education and vocational training. (sub. 68, p. 5)

This Appendix discusses the institutional framework established by government to facilitate the development and delivery of occupational education and training. It then discusses the training characteristics of the industry, including the occupational structure of the automotive workforce and the amount and type of training that is occurring. This appendix concludes by considering the issue of skills shortages in the industry.

G.2 Government involvement in occupational education and training

Training can be thought of as providing either specific skills or general skills. In the narrowest case, the usefulness of specific skills will be confined to a particular workplace. However, skills may be specific to a particular enterprise or industry. In comparison, general skills will be useful in a wide range of work and non-work situations. Communication skills are one example of general skills. In many instances, training courses will include a mix of specific and general skills.

The distinction between general and specific skills helps to identify the training incentives that exist for employers and employees. Employers will get maximum benefit from providing firm-specific skills. Consequently, when employers pay for training it is likely to be firm-specific. General skills will not only assist an individual to perform their work better, but also increase their job mobility and improve their ability to participate in society more generally. As a result there is less incentive to provide general skills training for employers, as it is more difficult for them to obtain returns on investment in general skills.

With regard to publicly funded training, there is a potential tension between firm-specific and general training. Firms want training to provide firm-specific skills. Employees want skills that are of use to existing and future employers. Government involvement in training aims to increase the amount of training and ensure that training incorporates both industry-specific and general skills. This tension between general and specific training was evident in the inquiry.

Some participants stated that training and education should deliver skills that are more directly applicable in the workplace. This concern related to school, TAFE college and university graduates. Air International Group stated that:

> ... there is a gap between what the education system and institutions are delivering and what the industry requires, particularly the level of skill for the sophisticated technologies being dealt with. (sub 37, p. 10)

At round table discussions, Mitsubishi said:

> ... there is a need through each of those levels, the high schools, the TAFE, and the university, to look at the basic courses and make sure that some of the subjects relate more [to] the industry (RTtrans., p. 95)

In the process of developing and delivering training courses, firms are in a stronger position than employees and students to influence the type of skills provided by that training, whether it is general or specific. At round table discussions, Automotive Training Australia stated that:

> ... organisations like our own and the TAFE colleges in particular need to be able to maintain a balance. In their brokering role with enterprise they need to look after the individual's generic and general skills as well as the company's specific skills. (RTtrans., p. 298)

In addition to providing funds for training, current government involvement in training takes the form of establishing and administering training policy, and encouraging industry and individual participation in training. This section discusses these elements in turn.

G.2.1 The National Vocational Education and Training System

In the 1980s, the need to improve skill levels and institutional arrangements for the delivery of training in Australia was widely recognised. The prices and incomes Accord provided the mechanism whereby unions agreed to restrain claims for wage increases in return for, among other things, business and government commitments to increase worker training. This process helped to raise the status of training in the policy arena.

The elements of current national training policy are collectively referred to as the National Vocational Education and Training System (NVETS). The union movement continues to be an integral part of this process.

NVETS is administered by Australian National Training Authority (ANTA), a Commonwealth Government statutory authority. Total planned expenditure by Commonwealth, State and Territory Governments on vocational education and training (VET) in 1996 was almost $2.8 billion (ANTA 1995).

NVETS is attempting to develop training characteristics that are common across all States and Territories and across industries. These national training characteristics include: training based on attaining work-related competencies or skills, with assessment based on demonstration of these skills; training programs that combine learning on- and off-the-job; and national recognition of qualifications with articulation into higher level qualifications.

A key national training policy objective is to increase young people's participation in education and training (see Box G.1).

Box G.1 Targets for training and education in Australia

In 1991, the Commonwealth and State and Territory Ministers responsible for vocational education and training endorsed the following targets.

By 2001, 95 per cent of 19 year olds:

- are participating in or have completed year 12; or
- have completed year 10 or 11 and are participating in or have completed a formally recognised additional education and training.

By 2001, 60 per cent of 22 year olds:

- have attained level 3 or higher qualification; or
- are participating in education and training programs which lead to a level 3 award or higher level qualification.

Source: ANTA (1995, p. 17).

The current Commonwealth Government is changing training policy in a number of ways. Three key changes are:

- the introduction of the Modern Australian Apprenticeship and Traineeship Scheme (MAATS) that is intended to increase young people's participation in training;
- encouraging small firms to become more involved in the development of training policy; and
- increasing the use of the competitive tendering process to allocate training funds via a program called User Choice.

The aim of User Choice is to give training users, identified as both employers and employees, a role in determining the training provider that delivers their training. In a Report to the ANTA Ministerial Council it was stated that:

> The objective of User Choice is to increase the responsiveness of the vocational education and training system to the needs of users through the encouragement of a direct and market responsive relationship between individual providers and users/clients, particularly enterprises. (Axarlis 1996, p. 29)

In the automotive industry, each vehicle manufacturer is a registered private provider of training, making these companies both users and providers of training.

These changes to national training policy provide increased scope for firms to customise publicly funded training to meet their specific enterprise requirements.

The development and delivery of automotive training occurs in the context of this national training policy agenda.

G.2.2 Encouraging occupational education and training in the automotive industry

Industry input into the training system occurs via industry specific organisations called Industry Training Advisory Bodies (ITABs). ITABs operate at both a National and State level and are responsible for the promotion and development of training and for representing the views of industry in training policy development. Members of ITAB Boards are drawn from industry, unions and government.

Automotive Training Australia is the national ITAB for the automotive industry, with responsibility for training in the automotive vehicle manufacturers, original equipment component producers and retail, service and repair sectors.

Responsibility for training in the broader automotive components sector rests with the Manufacturing, Engineering and Related Services ITAB which is responsible for manufacturing and engineering industries.

In addition to the national ITAB each State and Territory has both an Automotive and a Manufacturing Engineering and Related Services ITAB.

As Automotive Training Australia is solely concerned with automotive training, it is the ITAB that is considered in this appendix.

Members of the Automotive Training Australia Board are drawn from:

- the Federal Chamber of Automotive Industries (FCAI);
- the Motor Trades Association of Australia (MTAA);
- the Australian Manufacturing Workers Union (General and Vehicle Division); and
- the Department of Employment, Education, Training and Youth Affairs.

Some of the training priorities identified by Automotive Training Australia for 1996–97 are to:

- encourage increased participation in training;
- develop closer links with TAFE and higher education institutions;
- give greater emphasis to best practice; and
- further acknowledge the needs of small business (ATA 1996).

Linking training and jobs

The Vehicle Industry Award (1982) comments on the importance of training:

> ... the parties agree that there is an ongoing need for joint involvement in achieving the required skills upgrading. Specifically this upgrading is in response to:
>
> (i) the need to meet the career aspirations of employees;
>
> (ii) fulfilling the employer's objectives of continuous improvement in quality and productivity;
>
> (iii) the successful introduction and implementation of new technology;
>
> (iv) the changing role of operating supervisors and the need to improve leaderships skills in the light of this change; and
>
> (v) the possibility of future organisation changes and job restructuring. (clause 50 (g)(i-v))

Part of the Accord process involved establishing Structural Efficiency Principles. These Principles provided incentives for employees to undertake training by establishing career paths that linked training to job classifications and by encouraging multiskilling.

The Vehicle Industry Award 1982 links training to job classifications. For example, a person employed as Vehicle Industry/Production employee Level II is required to have completed 'up to three months structured training so as to enable the employee to perform work within the scope of this level'. This link creates an identifiable career path for employees and encourages them to complete training courses.

As well as its primary and positive function of encouraging training, the existence of a formal link between training qualifications and jobs can create a situation often described as 'credentialism'. That is, the situation where it is necessary to obtain a training qualification before being employed in a position, but it is not necessary to have the skills acquired from that training in order to perform the tasks of the position. When training is publicly funded, there is a potential for an increase in credentialism, and with it a significant waste of training resources.

In its submission to this inquiry, Holden acknowledged that the improved skill level of its workforce was facilitated by industrial agreements. However, it suggested that:

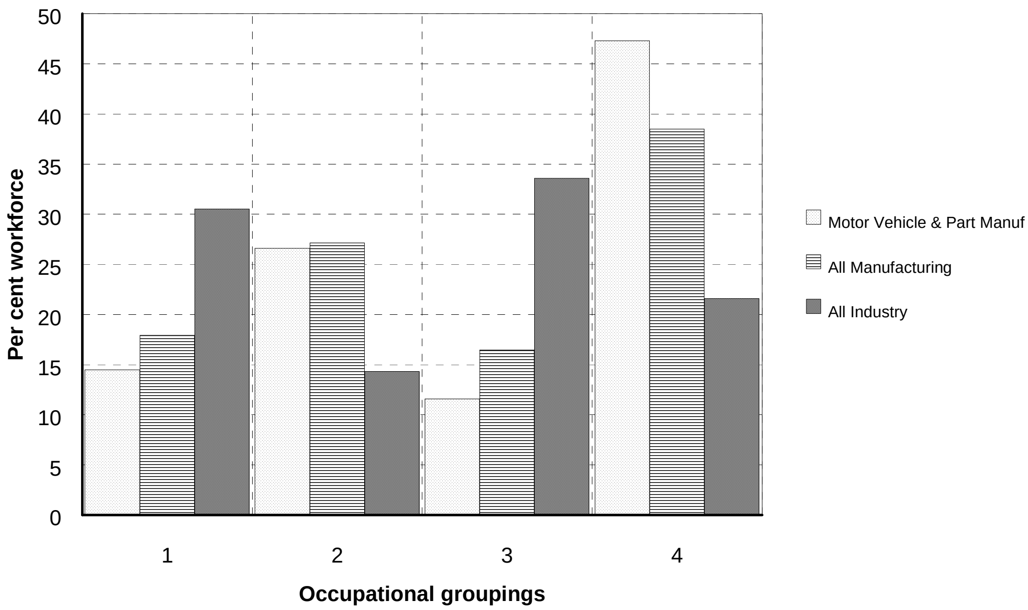
> ... there is a need to move from the link between wage outcomes and training towards a more performance based model. (sub. 19, p. 43)

G.3 Vocational educational and training in the automotive industry

The type of training best suited to a particular industry will be influenced by the occupational composition of its workforce. The Australian Bureau of Statistics has developed an eight level skill-based classification of occupations called the Australian Standard Classification of Occupations (ASCO).

Using ASCO, the difference between the occupational composition of the automotive industry and the Australian workforce as a whole is evident. Approximately 45 per cent of employees in the Australian automotive industry are employed as Plant and machinery operators and drivers, or Labourers and related workers, and over 25 per cent are employed as Tradespeople (see Figure G.1).

Figure G.1 **Comparison of automotive, manufacturing and all industry employment by ASCO, 1996**



Occupational Groupings:
1 Managers, administrators, professionals and para-professionals (ASCO 1-3)
2 Tradespersons (ASCO 4)
3 Clerks, salespersons and personal service workers (ASCO 5-6)
4 Plant and machine operators and drivers, labourers and related workers (ASCO 7-8)

Note: Motor Vehicle and Parts Manufacturing are defined by ANZSIC 281.
Source: ABS (1996c and unpublished data).

In many automotive firms, changes to technology, and the adoption of lean production management techniques, have changed the nature of work and consequently the skills required to complete this work. This is particularly the case for the non-trade jobs, identified in the ASCO categories of Plant and machinery operators and drivers, and Labourers and related workers. The development of training for non-trade jobs, in the form of the Vehicle Industry Certificate (VIC), has been a feature of automotive training in the 1990s.

G.3.1 Training expenditure by industry

Expenditure on training in the automotive industry is above the average expenditure for both the manufacturing sector and all industries. However, unlike the manufacturing sector and all industries, the measures of training activity in the automotive industry seem to have decreased between 1989 and 1993 (see Table G.1).

Table G.1: **Average training expenditure, Australia, July to September, 1989 and 1993**

Industry	*Per cent of gross wages and salaries*		*Dollars per employee*		*Hours per employee*	
	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**	**132.9**	**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 1990, 1994 and unpublished data.

Vehicle manufacturers

The decrease in all measures of training expenditure from 1989 to 1993 for Motor vehicles and parts sector does not seem to reflect the increased emphasis on training reported in submissions by the four Australian vehicle manufacturers and a number of component manufacturers.

Ford reported that the international average expenditure on training for vehicle manufacturers is 4 per cent of payroll per year (sub. 14, p. 3.1). Toyota commented:

> Training is an important element of Toyota's human resources development policies and an integral element of the company strategy to achieve best practice performance levels. Expenditure on training and the time available for training have both increased — in 1996 an estimated $8 million was invested in training. (sub. 106, p. 5)

Ford added:

> To meet the challenges of the complex technological environment of car manufacturing and to enable Ford to strive for international competitiveness, it has been necessary for the Company to continually spend up to eight per cent per annum of its annual salary and wage bill on the development and implementation of strategically important education and training programmes. (sub. 14, p. 3.1)

The eight per cent of Ford's payroll is approximately $16 million (sub. 14). In 1995, approximately 3250 Ford employees enrolled in accredited training and education courses, from traineeships (including the VIC) to Masters degrees (ANTA, 1996). In 1995, Ford was awarded the ANTA Employer of the Year Award.

The new Toyota vehicle assembly plant at Altona, opened in 1994, included a $2.8 million training centre. The Commonwealth and State Governments provided $1.2 million in financial assistance for the construction of the centre. Toyota stated that the training centre:

> ... demonstrates Toyota's long term commitment to car manufacture in Australia and is part of its strategy to improve competitiveness of locally built Corolla and Camry and develop export markets. (sub. 15, p. 6)

Holden reported that 4133 of its employees are currently enrolled in the VIC, the Advanced Certificate or Drafting traineeships. Over 500 Holden employees have graduated from these courses. Holden stated that:

> ...employee up-skilling plays a key part in Holden's improvement strategy. (sub. 19, p. 40)

Holden added:

> Considerable time was consumed in the development, accreditation and articulation of the relevant training programs. It took almost 5 years to get the various training programs operational. As discussed in Holden's initial submission, considerable progress has been now made with in excess of 4000 participants and 500 graduates from this training. (sub. 111, p. 38)

Mitsubishi explained:

> Maximising the potential of individual and team skills through continuing structured training programs is a key MMAL human resources strategy. (sub. 34, p. 15)

Mitsubishi invested considerable effort in customising the VIC. It reported that all new employees undertake training via the VIC, and that 2700 existing employees have participated in the VIC since 1994 (sub. 34, p. 16).

Component manufacturers

As discussed in Appendix G the automotive component sector employs more people than the vehicle manufacturing sector. A number of component manufacturers have indicated to the inquiry that training is an important element of their operations. This is particularly so for component firms that have adopted lean manufacturing production techniques.

Hella Australia commented:

> Hella Australia recognised the need to maintain and improve the skills of its workforce.
>
> Therefore, in order to foster a training culture, the company implemented a comprehensive training policy and program with the aim of 25 hours training per employee per year. The cost of this commitment totals 2.9% of the payroll. (sub. 11, pp. 10–11)

While Robert Bosch Australia (RBAU) stated:

> A strong emphasis on training assists RBAU to retain and develop employees. Almost 10% of RBAU's workforce are undertaking training courses ranging from English to MBA studies, with the objective of gaining reclassification and/or preparing for career development opportunities. RBAU was named "The Victorian Training Employer of the Year" for 1996. (sub. 65, p. 3)

However, small firms in all industries tend not to be as involved in training as large firms. Automotive Training Australia observed that quite often the four large manufacturers have infrastructure to provide better training, which four and five-person workshops cannot provide. (RTtrans., p. 297)

The Victorian ALP explained that perhaps not as many resources had been systematically devoted to the development of skills in the components industry as in vehicle manufacturing:

> The vehicle manufacturing industry has recognised the importance of these issues and has channelled considerable resources, over the years, into vocational literacy and numeracy skills training. However, this issue has not been dealt with systematically by the components manufacturing industry and recently English as a Second Language (ESL) training provision has been subject to funding cutbacks. (sub. 119, p. 12)

It is possible that the existing structural arrangements for the promotion and development of training impede training in the component sector. As noted above, automotive component producers' training arrangements are the responsibility of the Manufacturing, Engineering and Related Services ITAB. Automotive component producers are a relatively small part of the entire Manufacturing and Engineering industry represented by this ITAB.

To facilitate training in the component sector, Toyota has developed training courses which it provides to its suppliers on a cost recovery basis.

G.3.2 Enrolments in vocational educational and training

ANTA (1995) estimated that there would be 33 760 government funded enrolments in automotive VET courses in 1996. These training places included courses relevant to both automotive manufacturing and retail, service and repair courses. The enrolments represent 2.7 per cent of expected government funded VET places and $75.4 million of government expenditure on VET, assuming that funding is directly proportional to enrolments.[1] Automotive training courses are conducted at 90 TAFE Colleges.

In addition to government funded enrolments, Automotive Training Australia (1996) reported that there would be approximately 14 700 privately funded enrolments in automotive related VET courses in 1996. The private funding was generally provided by the four vehicle manufacturers (see Table G.2).

Table G.2: **Automotive VET planned activity (enrolments), Australia, 1996**

Occupational level	*Government funded enrolments*	*Privately funded enrolments*[a]	*Total enrolments*
Module only	2 425	2 063	4 488
General unspecified	2 26	180	406
Operative/Clerical	2 843	9 475	12 318
Trades/Skilled	28 268	1 583	29 851
Para-professional	0	1 390	1 390
Total	**33 762**	**14 691**	**48 453**

a Figures shown are from the manufacturing sector almost exclusively.

Source: Automotive Training Australia (1996).

All four Australian vehicle assemblers are registered as private providers of training. This allows them to deliver training that results in nationally recognised qualifications. The training may be either privately or publicly funded. For example, Ford’s $16 million expenditure on training was supplemented by $1.2 million received from government to deliver training as a registered private provider (sub. 14).

1 At present it is not possible to determine the actual amount of money allocated to specific areas of training activity. This figure includes both recurrent and capital expenditure.

G3.3 Automotive training and education qualifications

Vehicle Industry Certificate

The VIC was established in 1990 as a formal qualification for non-trade employees working in the manufacturing, supply, component parts and importers sectors of the industry.

Completion of the VIC involves 400 hours of training and results in a nationally recognised qualification of Certificate level 1 or 2.

Training is delivered both on- and off-the-job. Each vehicle manufacturer has customised the VIC to deliver skills that are enterprise-specific. The VIC provides a ‘stepping stone’ for employees wishing to undertake further training, including apprenticeships.

Holden stated that:

> Since the inception of the training structures there has been up-skilling beyond entry level qualifications. The starkest example of this is the impact of the Vehicle Industry Certificate (VIC) for Production employees. Historically, this key group of employees was regarded as largely unskilled. The implementation of the VIC has enabled employees to enhance their skills and knowledge, reveal latent talents that may have otherwise remained hidden and improved the contribution of these employees to the business. (Sub. 111, p. 38)

As well as the four automotive producers, employees of 15 vehicle component manufacturers are currently enrolled in the VIC.

In 1995–96, the South Australian Government provided $9.6 million for the VIC. It expects that 5800 automotive employees in South Australia will have undertaken the VIC by 1999 (sub. 61).

Certificate in Engineering Production

The Certificate in Engineering Production (CEP) is the training program that non-trade employees in automotive component manufacturing firms have access to, and in this way it is similar to the VIC. There is a strong emphasis on delivering training on-the-job. The Manufacturing Engineering and Related Services ITAB is responsible for the development and administration of the CEP. The Certificate exists at qualification levels 1, 2, and 3 (Engineering Skills Training Board 1996).

Apprenticeships

About 60 per cent of people enrolled in automotive related courses at TAFE are completing trades training or apprenticeships. The five vehicle apprenticeships available are: vehicle mechanics, panel beaters, vehicle painters, vehicle body makers and vehicle trimmers. In 1995 there were 4337 commencements and recommencements of vehicle apprenticeships, and 2737 completions. Vehicle industry apprentices are employed in both vehicle manufacturing and retail service and repair sectors of the industry.

Advanced Certificate in Automotive Development

The Advanced Certificate in Automotive Development (ACAD) is intended to provide skills for trade-qualified people working in experimental, developmental and testing divisions in vehicle manufacturing. On completion it provides a qualification of Certificate level 4. Approximately one sixth of the course content can be enterprise-specific. Assessment involves formal examinations as well as demonstrated competence in work situations (ACTRAC 1996).

University courses

The university courses undertaken by automotive employees are likely to be predominantly engineering based and increasingly contain management components. Participants reported in this inquiry that a number of universities have specialised automotive engineering faculties. Ford identified a range of university courses by type and level in which their employees are enrolled (see Table G.3).

Table G.3: **University courses in which Ford employees are enrolled**

Associate Diploma	*Bachelor Degree*	*Graduate Diploma*	*Masters Degree*
Technology Management	Engineering Manufacturing	Engineering Manufacturing	Engineering Manufacturing Systems
Technology Manufacturing	Technology Manufacturing	Business	Business Administration
Commerce/ Business	Technology Management Business Management	OHS	

Source: Ford (sub. 14).

There appear to be growing links between industry and certain universities. At round table discussions Ford stated that:

> ... we get very closely involved with the education institutions like Deakin, RMIT, Melbourne Uni, ... in curriculum development with those institutions so they can give the sort of development that our people need. (RTtrans., p. 198)

Deakin University described the recent development of a Masters program that involves students spending 80 per cent of their time in the vehicle manufacturer's plant (RTtrans., p. 306). After the draft report Deakin University described its ongoing relationship with Ford:

> Deakin University, which has one of its main campuses based in Geelong, has established a strong relationship with the Ford Motor Company in Australia. This relationship with Ford was initially built around training for plant personnel provided through Deakin Australia, but has grown to now include research Masters students to support current manufacturing operations in the Geelong stamping plant and involvement in the delivery of a global coursework Masters of Engineering program. The coursework Masters program, which is still being formulated, involves collaboration with Loughborough University in the United Kingdom and Michigan University in the United States. Therefore, it can be seen that the level of interaction is quite diverse and we believe that for Australia this represents a unique development of an integrated education and research program underpinning the operations of a major manufacturer. (sub. 186, p. 1)

In their submissions to this inquiry, both Ford and Mitsubishi commented that the university curriculum could be improved by being more focused on specific automotive industry requirements.

It is of interest to note that the trend towards globalisation in the automotive industry may be reflected in the development of 'global' university courses. At round table discussions Deakin University described why such courses might develop:

> Ford see that their workforce, especially say at the upper executive level, were becoming more mobile as they globalise and they see the need to be able to have masters degrees by course work which can move with the employee as they move around the world. (RTtrans., p. 318)

Articulation

Some participants commented on articulation in training — this is when prior on-the-job experience and training is recognised by educational institutions. For example in the automotive industry, experience as a line worker may be recognised towards a trade certificate, or prior training as an electrician may be recognised towards an electrical engineering degree.

The process of articulation allows automotive employees to become professional engineers by working through an apprenticeship or even starting as a line worker. The Society of Automotive Engineers gave the following example of how articulation works in practice:

> .... this year into our [engineering] department we would have taken four apprentices out of the TAFE system for the first time, all with automotive background. Previously when we had looked at accreditation of TAFEs we could only identify that electrical engineering was appropriate for mechanical engineering and mathematics preparation, but nonetheless we've been persuaded that we have to take risks with the brightest of

> these young people and provide courses to upgrade their level of mathematics in order that they can participate in a university education.
>
> Ford identify their close liaison with TAFE colleges in introducing training programs for their lower level of skill workforce, and I think this is very important in both the Institution of Engineers and in our society. We have taken upon ourselves to recognise this lower level of technical training and participate in opening career paths for these people into higher levels of training. (PHtrans., p. 575)

Deakin University added:

> .... one of the aspects of our work is the so-called pathways articulation program which is essentially through from the four certificates which are at the trade level, right through to an associate degree, bachelor of technology and then a bachelor of engineering, and at present we have about 60 people from the Geelong plant at various stages of the program.
>
> .... basically people can come in at whatever level their skills allow them to and they can also jump out at whatever level they want to achieve in the process. We're only at a stage of graduating our first B.Eng, but those persons have come from a trade background and this year will be finishing their bachelor's degree in manufacturing engineering, while being fully employed. (RTtrans., p. 301)

However, although acknowledging the benefits of articulation, some participants found the system unduly complex. Holden explained:

> There are some concerns about the complexity of the system. The required processes to achieve accreditation and articulation of qualifications remain lengthy, complex and cumbersome. (sub. 111, p 40)

G.4 Skills shortages

Skills shortages can indicate that the training mix in type and level of qualifications could be improved. Based on anecdotal evidence, Automotive Training Australia (1996) identified five automotive occupations that experienced skills shortages in 1995. These were:

- Engineer – Manufacturing;
- Toolmaker Automotive;
- Toolmaker;
- Clay Modeller; and
- Drafting (Automotive) (Automotive Training Australia 1996).

The Southern Region of Councils also reported shortages of vehicle painters and body makers in South Australia (sub. 70, p. 5).

Bendix Mintex identified projected skills shortages of engineers as a potential weakness for Australia as an investment location (sub. 72). However, participants in general have not identified skills shortages as a significant problem facing the automotive industry.

A number of participants commented on the strategy of recruiting engineers from overseas. At round table discussions, Lear reported recently recruiting employees from Germany, Ireland, America and Canada (RTtrans., p. 97). Air International also reported recruiting engineers from overseas (sub. 37). This practice appears to compliment the increasingly global nature of the industry.

H THE LABOUR MARKET

H.1 Employment in the motor vehicle industry

Unless stated otherwise, all employment data presented in this appendix is derived from the Australian Bureau of Statistics *Labour force survey*. The ABS *labour force survey* data differs from the ABS *Manufacturing survey* (used elsewhere in the report). The ABS *Labour force survey* defines ‘automotive manufacturing’ as those persons employed in the manufacture of trailers, vehicle bodies and caravans in addition to the manufacture of PMVs components and aftermarket parts — in comparison to the ABS *Manufacturing survey* which uses a more restrictive definition. The two surveys are not comparable, and the *ABS Manufacturing survey* provides a more accurate representation of employment in motor vehicle and parts manufacture.

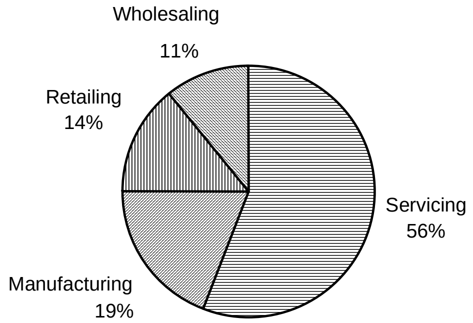
In 1996, the ABS *Labour force survey* estimated that about 370 000 people were employed in automotive retail, manufacturing, wholesaling and servicing industries. This includes people involved in motor vehicle and component manufacture, automotive electrical and instrument manufacturing, new and used car retailing, automotive electrical services, smash repairing, automotive repair and servicing and automotive fuel retailing. It does not include those employed in industries such as motor vehicle insurance and transport.

The ABS *Labour force survey* differs from other employment numbers used elsewhere in the report, particularly in relation to persons employed in the manufacture of motor vehicles and parts. The ABS *Labour force survey* estimates about 70 000 persons are employed in the manufacture of motor vehicles and parts, compared to about 47 000 in the ABS *Manufacturing survey*.

The ABS *Labour force survey* estimates the majority of employment in the automotive industry, nearly 56 per cent is in the servicing sector — for example, those people employed in smash repairing and automotive repair and servicing.

About 19 per cent of employees in the automotive industry are involved in manufacturing of motor vehicles and components (see Figure H.1).

Figure H.1: **Employment in automotive industry by sector, November 1996**



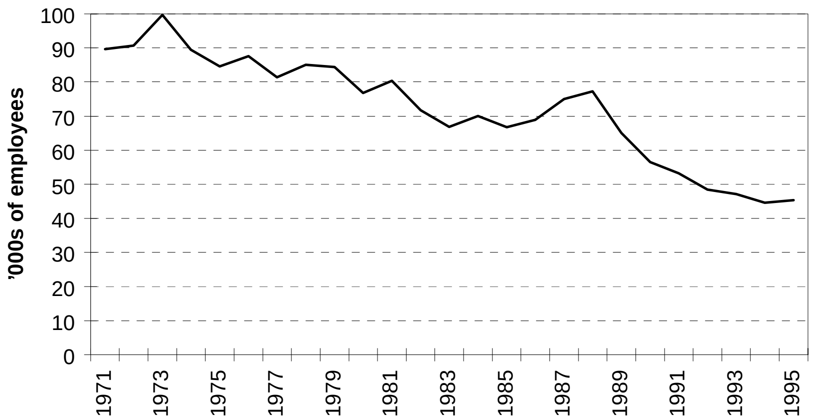
Source: ABS (unpublished labour force survey data).

H.1.2 Employment in motor vehicle and component manufacturing

Employment trends

Over the last 25 years employment within the automotive manufacturing industry has decreased from a peak in 1973 of nearly 100 000 persons to about 45 000 in 1995 (IC and DIST 1995b — see Figure H.2). Employment in the industry rose slightly between 1994 and 1995.

Figure H.2: **Employment in motor vehicle and parts manufacturing, 1971 to 1995**



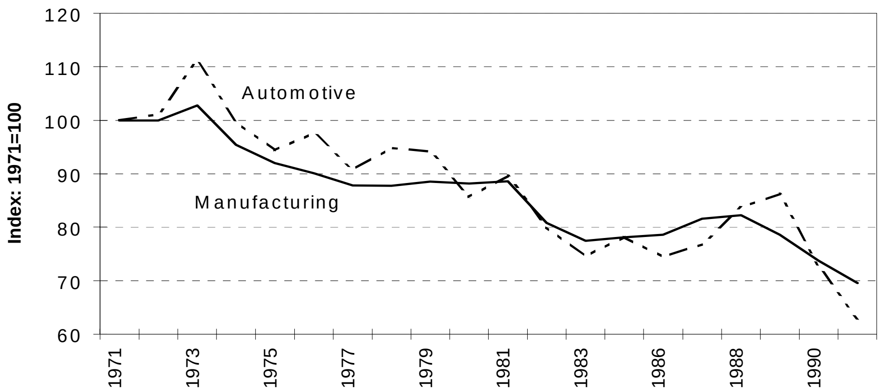
Source: IC (1995c) and (DIST 1995b).

The Department of Employment Education and Training (DEET) estimated:

> In just over a decade, between 1979 and 1991 the industry experienced a net job loss of over 18 000 persons, about 2.5 per cent per annum. Most of the job losses (15 400 jobs) were in the motor vehicle assembly sector and 2 800 in the component producing sector. The biggest decline occurred in the early to mid 1980s, although job losses continued in the assembly sector in 1987 and again in 1992. In the component manufacturing sector, most of the contraction was concentrated in the years 1983 and 1984 and again in 1991. (DEET 1994, pp. 1–2)

This decrease is similar in scale to the fall in employment experienced by the manufacturing industry in general over the same period (see Figure H.3).

Figure H.3: **Index of employment in the manufacturing and automotive industries, 1971 to 1991**

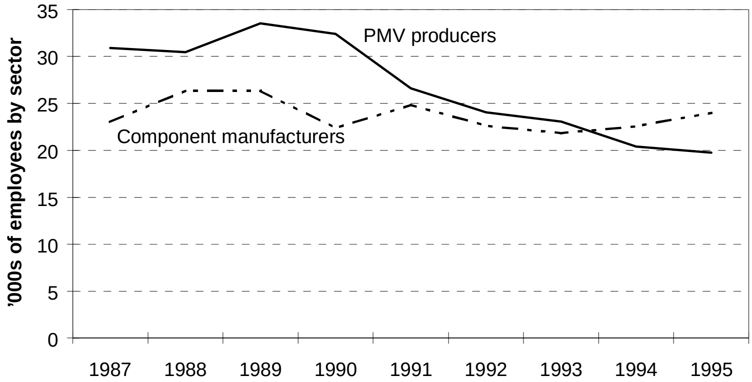


Note: No data was available for 1985.
Source: IC (1995c).

Employment by sector

In 1995, employment in motor vehicle manufacturing was about 20 000 persons (see Figure H.4), with the majority employed in Victoria and South Australia. The number of persons employed in the production of specialist automotive components is now around 25 000. Employment has increased over the last few years due to the increased level of component sales locally and overseas. More people are now employed in component production than in motor vehicle manufacture.

Figure H.4: **Employment in the automotive industry, 1987 to 1995**

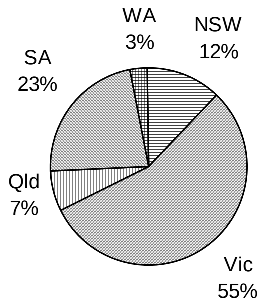


Source: DIST, AIA , and FAPM Industry Surveys as cited in DIST (1996).

Employment by State

Employment in motor vehicle and part manufacture is dominated by Victoria, and to a lesser extent South Australia, with about 25 000 and 12 000 employees respectively — over three quarters of all motor vehicle industry workers (see Figure H5). These figures differ from the ABS manufacturing survey (used in Chapter 3) but provide a more comprehensive state-by-state coverage.

Figure H.5: **Employment in motor vehicle and parts manufacture by state, Nov. 1996**



Source: ABS (unpublished labour force survey data).

Employment status

About 81 per cent of employees in the automotive manufacturing industry are male, while around 97 per cent are full-time employees. However, while almost all male employees are employed full-time, nearly ten per cent of female workers are part-time.

Approximately 45 per cent of employees in the Australian automotive industry are employed as Plant and machinery operators and drivers or Labourers and related workers, and over 25 per cent are employed as Tradespeople (see Figure H.6).

Figure H.6: **Automotive employment by ASCO, 1996**

Occupational Groupings

1 Managers, administrators, professionals and para-professionals (ASCO 1-3)
2 Tradespersons (ASCO 4)
3 Clerks, salespersons and personal service workers (ASCO 5-6)
4 Plant and machine operators and drivers, labourers and related workers (ASCO 7-8)

Note: Motor Vehicle and Parts Manufacturing are defined by ANZIC 281.

Source: ABS (1996c and unpublished data).

H.2 Industrial relations in the automotive manufacturing industry

H.2.1 Setting the scene

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. In the late 1980s a system was introduced, under which responsibility for determining terms and conditions of employment could be shifted to the workplace level by the establishment of enterprise agreements — with the agreements underpinned by an award safety net.

The spread of enterprise agreements

Enterprise agreements were designed to enhance labour productivity through award restructuring, multiskilling, a greater focus on training, and in particular changes to work practices and policy. The gradual and cautious move away from the rigid award system was designed to encourage flexibility in the workplace, in which both employees and employers could benefit from productivity gains.

Across the economy, about 8900 workplace agreements have been certified since 1991, with nearly three quarters of these being formalised since 1994. The spread of Enterprise Flexibility Agreements (EFA) in the non-unionised sector has been slower, with 185 EFAs ratified by June 1996.

The highest concentration of formalised enterprise bargaining agreements is in the manufacturing sector (about 36 per cent of agreements in 1995). In terms of changes to labour productivity, about 80 per cent of all agreements contain initiatives to increase productivity and around 15 per cent contain performance-productivity related pay rises.

The Workplace Relations Act

The introduction of the Workplace Relations Act may help to facilitate increased workplace flexibility and a shift to closer worker-employer relations. Some of the aims of the Act are to:

- simplify and focus the award system to a role of providing a safety net of minimum wages and conditions; and
- provide the opportunity to facilitate greater communication and agreement between employers and employees.

However, some of the features of the original Workplace Relations Bill have been changed in order to achieve its passage through the Senate — such as the retention of the 'no disadvantage test' and the vetting of agreements by third parties. This means that positive change may not occur as quickly as would have occurred with the original Bill.

The South Australian Government welcomed the new Act but agreed that political compromises may mean labour market flexibility is inhibited:

> The South Australian Government welcomes the new Federal "Workplace Relations Act 1996" as an improvement on the previous legislation. A review of the State legislation will be undertaken during 1997 to harmonise the South Australian Act with

> the Federal legislation. However, because of the political compromises that were made during the passage through Parliament, the new Commonwealth legislation falls well short of the labour market flexibility Australia needs to ensure its industry becomes internationally competitive. For example, while there is provision for award rationalisation and simplification, the award system retains its primacy. (sub. 169, p. 16)

H.2.2 Enterprise bargaining in the automotive manufacturing industry

The four automotive 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. Box H.1 provides an example of enterprise bargaining in the automotive manufacturing industry.

Box H.1: **Labour relations at Toyota**

At the start of the decade, Toyota Australia faced a labour relations environment which was still largely regulated and inflexible, and which operated under a centralised wage-fixing system. This system supported and perpetuated employee representation based on narrow craft or trade demarcations, which that promoted narrowly defined jobs and working arrangements. The process for creation of enterprise agreements remained dependent upon ‘industry disputes’. This continued to emphasise confrontation over co-operation.

Toyota Australia commenced negotiations in 1991 with the ACTU and the VBEF (now the Vehicle Division of the AMWU) to reach agreement on key Human Resource outcomes required to support the establishment of a new manufacturing facility at Altona.

Toyota Australia’s key requirements were:

- fixed term agreement with binding dispute resolution procedures;
- enhanced employee skilling and flexibility;
- single employee representation structure with an enterprise focus; and
- wage outcomes linked to Toyota Australia’s performance (Sharing in Success).

The initial 1991 agreement was negotiated in an environment that established common understanding and commitment on the need for changes to occur in workplace practices and relationships. Subsequent agreements have seen some progress in key areas, however the outcome still falls short of that envisaged by Toyota in the 1991 agreement. The most recently concluded agreement has re-established common goals in a number of these key areas and developed joint processes for their implementation.

Source: Toyota (sub. 15).

Initial agreements made by the major automotive manufacturers and their employees were very similar to one another in terms of wage outcomes (in fact three were identical). Over the course of the last five years, agreements have remained very similar in nature — for example, the industry-wide claim (all manufacturers and most component producers) in 1994 included a 10.3 per cent wage claim over three years, changes to long service leave criteria and journey accident insurance. However, productivity measures and changes to work place operations now differ between agreements. Ford described their enterprise bargaining process:

> Ford Australian entered its first Enterprise Bargaining Agreement (EBA) in 1992, its second in 1993/94, its third in 1996/97 and is due to enter its fourth from July 1, 1997. The EBA process embraced by Ford in Australia is regarded as world class in that it enables Ford to arrive at wages and conditions outcome specifically tailored to the needs of the local workforce and which also recognises the requirements for the wage/ productivity enhancement, education and training, and continuous improvement of product and process quality.
>
> The EBA process has enabled Ford to streamline the negotiating process by effectively dealing with the workforce as one group. The EBA outcome has meant that the Ford workforce is now a close-knit unit where information is exchanged freely and all employees are focused on productivity and quality. (sub. 107, p. 29)

The latest claim under discussion is a 10 per cent wage increase at Holden, who have already had increases of over 10 per cent in the last two years.

H.2.3 Industrial disputes

Until 1995, increasing labour productivity within the automotive manufacturing industry had been accompanied by a fall in the level of industrial disputes. From 1989 to 1994, the number of industrial disputes in the automotive manufacturing industry fell from 20 to two. However in 1995 the level of industrial disputes rose to ten.

From 1989 to 1994, the number of days lost to industrial disputes fell significantly to 36 working days lost per 1000 employees in 1994, well below 1993 levels and less than half of the next lowest level in 1991. However, in 1995 the number of workings days lost increased to 212 per 1000 employees. Much of this lost time was due to the dispute at Toyota’s Altona factory. The dispute continued into 1996, as Toyota explained:

> In the 1996 calendar year to date, Toyota Australia has lost around 5.5 per cent of available hours to industrial action which saw the Altona plant closed for two weeks. The dispute was associated with the negotiation of the third Enterprise Bargaining Agreement. (sub. 15, p. 12)

H.2.4 Union membership

About 90 per cent of the workforce in the motor vehicle manufacturing sector is unionised. The Australian Manufacturers Workers Union (AMWU) (Vehicle Division), formed in 1995 through the amalgamation of several unions, has the largest representation.

Union membership in the components sector varies. Larger companies tend to have higher memberships, while smaller companies experience variable representation. Employees not involved in enterprise agreements are covered by minimum rates awards, in which the minimum rate of pay is specified but over-award payments are common. Again, most union members in this sector belong to the AMWU, but a number of unions are often represented on-site.

Some participants felt that dealing with multiple unions made negotiating enterprise agreements difficult. Hella described the existence of multiple unions in the workplace as a hindrance (sub. 11). This was particularly the case when unions with a small amount of on-site representation had to be given as much say in negotiations as unions which represented the vast majority of workers.

Employers negotiating with only one union on-site, such as Pilkingtons and Nissan, saw this as an advantage over other firms. For example, Nissan argued:

> .... the [aluminium casting] plant was set-up in 1982 as a single union site so that production people, maintenance, electricians, fitters, toolmakers, you name it, were all covered and still are covered by the vehicle division of the metal workers. Issues such as demarcation are not experienced in our company, to the point where staff and managers, including myself, do and can run machines without any impediment from union issues. That is not the case in the vast majority of Australian companies and so the frustrations that the majority of Australian manufacturing companies experience with labour impediments, we don't experience. (PHtrans., p. 332)

H.3 Labour productivity

H.3.1 Labour costs

Labour costs represent about 20 per cent of the cost of assembling a motor vehicle. They also constitute a significant proportion of up and downstream costs. These labour costs are largely determined by the award structures, which set out terms and conditions of employment, and to a large degree determine flexibility within the workplace. As the BIE (1996a) commented:

> Wages and salaries are a significant cost in the process of producing PMVs and components. Input-output data suggests that for every $100 of output from the Motor vehicle and parts industry around $21 is outlaid by the industry on wages, salaries and

> supplements. While these outlays are clearly an important aspect of the costs to make and sell a PMV the industry's management has, until recently, had limited ability to directly negotiate pay and flexible conditions with its employees. (p. 35)

H.3.2 Labour productivity

Many participants commented that over recent years labour productivity has improved across the automotive manufacturing industry. For example, Toyota (sub. 15) explained that gross man hours per Camry have decreased by 25 per cent since 1990.

Participants attributed increased productivity to a range of measures — such as the introduction of lean production techniques, award restructuring and changing workplace practices, increased expenditure on capital and infrastructure, and better training. Dr Andrew Southcott explained:

> The Department of Industry, Science and Technology in 1996 reported labour productivity growth between 1990 and 1995 of 44 per cent in the component sector and 37 per cent in vehicle manufacture. The Bureau of Industry Economics has reported that these productivity gains have resulted from investment in labour saving technology, changes in capacity utilisation, reductions in the cost of locally sourced components, pressure from customers and upgrading of work force skills. (sub. 127, p. 3)

While labour productivity has improved domestically, overseas competitors have not been standing still. Chapter 4 contains a range of domestic and international labour productivity comparisons.

Although labour productivity has improved in recent years, PMV producers argued that further productivity improvements are going to be increasingly difficult to achieve. For instance, Toyota is planning for productivity improvements of about 2 per cent per annum, arguing that it will be difficult for them to achieve greater increases because:

> ... the easier gains have been made; quality gains which have contributed to productivity gains are likely to be smaller as catch up is now largely complete; greater manufacturing complexity problems associated with the Camry export program; and efficiency increasing investment is not justified at present. (sub. 15, p. 41)

Ford anticipates that the rate of improvements in labour and overhead performance will:

> ... continue to reduce as the major differences in our competitiveness have been eliminated and we are left to work on the more marginal areas where continuous improvements are necessary. (sub. 14, p. 3.1)

In their second submission, Ford further claimed that:

> ... Australian automotive manufacturing has largely closed the gap to world best labour productivity other than for a scale impediment adjustment. (sub. 107, p. 29)

H.3.3 Skills and workpractices

As briefly outlined above (as discussed in greater detail in Chapter 4), partial measures of labour productivity improved over the period 1985 to 1995. These improvements have coincided with an increased emphasis on employee skill development and changes to the way work tasks are organised.

Workplace practices

A large part of the improvement in labour productivity over recent years is due to changing workplace practices. Toyota highlighted the benefits of changing work practices:

> Over the last six years the situation has improved across many dimensions. Labour turnover is down to 13 per cent, costs of WorkCover claims have fallen from $12 million in 1989–90 to $4 million in 1995–96, safety has improved and suggestions per month are up from about 500 in 1990 to over 1000 in 1995. (sub. 15, p. 16)

An example of improved workplace practices, labour relations and productivity at Denso is given in Box H.2.

Ford identified its ‘people programs’, incorporating work practices, as a factor that contributed to improvements in quality, productivity and product value:

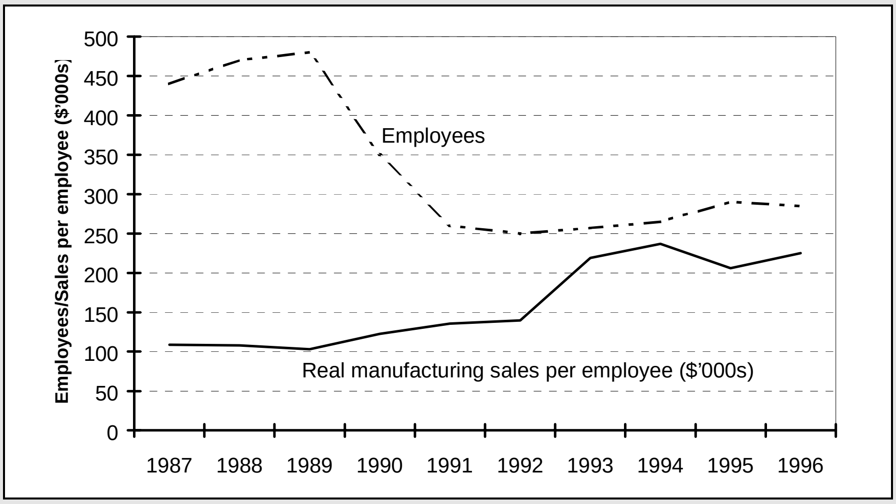
> Labour Relations have driven much of this change with the introduction of the Enterprise Bargaining Agreement (EBA) process, Natural Work Groups (NWGs), comprehensive employee surveys and information sessions, introduction of Vehicle Industry Certificate (VIC) and other training, and the rationalisation of the organisation structure. Other gains have come from the adoption of best practice manufacturing concepts. (sub. 14, p. 2.2)

Although increasing competitive pressures were the major driver of change to workplace practices, the introduction of enterprise bargaining helped streamline these changes. Bamber and Lansbury added:

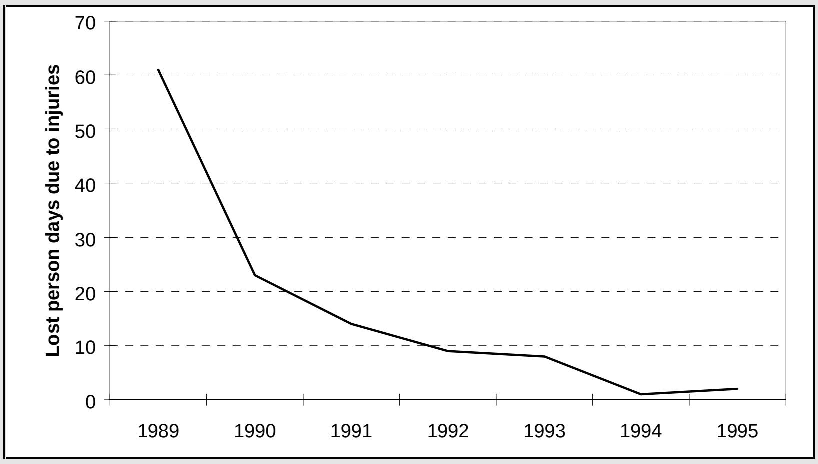
> ... the extent to which award restructuring has precipitated ‘workplace reform’ varies between different companies and plants. Award restructuring did not make these changes inevitable, but rather more feasible. (Bamber and Lansbury, 1995, p. 100)

Box H.2: **Industrial relations and labour productivity at Denso**

Denso, formerly Nippondenso, is an automotive component company whose activities include making engine cooling and climate control units for cars. Employees, management and unions at Denso have worked hard to improve their labour relations and productivity since the late 1980s. While staff levels have fallen, productivity has increased (see below).



As well as increasing levels of productivity from $75 000 worth of sales for each employee to $225 000 (see above), quality of output has also increased. Denso was awarded Toyota supplier of the year award in 1996, and aims to achieve ISO9001 and QS9000 certification by March 1997. In addition Denso has set the following goals — to aim for zero customer returns, develop a *kaizen* culture and reduce plant emissions to 20 per cent of government requirements.



Increasing productivity and quality was not traded-off for decreasing safety levels. Changing work practices, greater employee involvement in production decisions and better industrial relations has meant that the total number of lost time workplace injuries has fallen from 61 in 1989 (3700 days lost) to 2 in 1995 (3 days lost) (see above). This has led to a substantial decrease in WorkCover premiums.

Source: Information obtained on industry visit.

Although improvements have been made over recent years, the labour market is still not as flexible as it could be. For example Mitsubishi highlighted the constraints of the current system:

> Progress in team based production — a key MMAL objective for the remainder of the decade — has been limited to some extent by the current enterprise bargaining process as a result of both the interaction between different unions and the restrictive effect of pattern bargaining on the development of team based production groups. ...
>
> In addition pattern bargaining and reliance on strict relativity relationships between companies is a restraint on the localised development of innovative and progressive work practices, especially when compared to overseas company based union structures which tend to encourage the pursuit of common objectives. (sub. 34, pp. 12–13)

Chapter 6 puts forward recommendations for more flexible labour market arrangements.

H.3.4 Explaining increases in productivity and changes to work practices

The process of continuous improvement which is an integral part of lean production has been driven by the increasing competitive pressures faced by the Australian automotive manufacturing industry.

Labour productivity has increased via award restructuring and changes to employment practices, the introduction of career paths and multiskilling (for example the introduction of the Vehicle Industry Certificate (VIC) which ties wage increases to improvements in acquired skills). Other factors contributing to labour productivity include expenditure on capital and infrastructure and changing technologies. Mitisubishi said the change could not be attributed to one particular factor:

> Non trade wages productivity has improved markedly as a result of improvements in industrial relations, enhanced recruitment procedures and the customised VIC training format that provides a structured learning pathway within the company. As employees progress through the VIC and utilise the skills and knowledge obtained, Mitsubishi Motors Australia Ltd (MMAL) anticipates that labour productivity will improve further. (sub. 34, p. 12)

Changes to workplace design and practices, necessary to cope with increased competition, have been helped by changes to the industrial relations system and the introduction of enterprise bargaining — but change would probably have occurred to some extent even without industrial relations reforms, as reforms were necessary to enable the industry to meet the increasing competition from imports. However, the introduction of award restructuring and enterprise agreements have assisted firms in their attempts to improve their productivity. Ford said:

> We’ve embraced the enterprise bargaining process pretty extensively in terms of our negotiations with the workforce, we’ve introduced an actual work group process to look at statistically how we can better improve our assembly processes and manufacturing processes, and we’ve embraced education and training to the extent that that's now 8 per cent of our payroll. So we think on labour productivity, in terms of labour management practices, we’re pretty good. (RTtrans., p. 218)

The increasing internationalisation of the automotive manufacturing industry, and the resulting increase in competitive pressures, has encouraged motor vehicle manufacturers to utilise their resources better, through more efficient labour practices, cost control, and quality and productivity improvements. Bamber and Lansbury (1995) noted that:

> 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 resources policies. This has come as a shock to the automotive industry which was sheltered for so long from international competition. (p. 109)

Although increasing competitive pressures were the major driver of change, as discussed above, amendments to the industrial relations systems helped streamline these changes. Bamber and Lansbury (1995) added:

> ... the extent to which award restructuring has precipitated ‘workplace reform’ varies between different companies and plants. Award restructuring did not make these changes inevitable, but rather more feasible. (p. 100)

H.3.5 Changes to management practices

Management within the automotive manufacturing industry has had to adapt to competitive pressures and amendments to the industrial relations system.

Increased competition has forced the adoption of new organisational techniques associated with lean production, such as *kanban* (demand driven, just-in-time production) and *kaizen* (the quest for continuous improvement). In order to adapt to these new organisational techniques, management has had to adopt a more flexible and cooperative approach in relations with employees. The BIE survey of the impact of microeconomic reform on the automotive industry found that manufacturers responded to competitive changes by changing their relationship with their employees:

> All four PMV manufacturers reported that they had responded to changes in competition by changing their relationship with employees. Similarly, over 90 per cent

> of component producers changed their relationships with employees in response to the changed environment. (BIE 1996a, p. 81)

H.4 Where to from here?

Since 1990 labour productivity and industrial relations in the automotive manufacturing industry have improved. However, there is further scope for improvement.

As noted earlier, labour is a significant proportion of total costs and therefore this input must be used efficiently. Some participants noted that change will take time and was not only about changing the industrial relations system, but also about the need for cultural change. Toyota said:

> I think that whilst .... there are difficulties at the moment, talking about trades and non-tradespeople in terms of working at a specific discipline, I think that's an issue we're working through and I think that's an issue we can resolve in the longer term. I don't think there's any — I can't think of any specific systematic change or award change that's going to necessarily solve that problem overnight. It's a cultural change which management have got to engender, not just changing a few words on a piece of paper. (PHtrans., p. 264)

H.4.1 Factors restricting change

Overall there needs to be a continuation of the change in the 'mindset' of the workplace, in which workers and employers needs are aligned. The introduction of the Workplace Relations Bill may help facilitate this, with increased flexibility and a shift to closer worker-employer relations.

Factors restricting further improvements in labour productivity within the automotive industry include:

- the complexity of the current system;
- the maintenance of award conditions;
- pattern bargaining; and
- restrictive work practices.

These factors, and suggestions for change, are explained in Chapter 6.

I INTERNATIONAL TRADING ENVIRONMENT FOR AUTOMOTIVE PRODUCTS

I.1 Introduction

International trade in automotive products is characterised by competition in regional markets between multinational automotive companies. The largest markets are North America, Europe and Japan — which are also the homes of the major automotive companies. The high barriers to trade in automotive products that prevailed in most markets until recently resulted in the major vehicle producers establishing manufacturing facilities in many countries. This has left them with a choice of plants from which to supply their markets.

While the world's largest markets for automotive products are relatively open to Australian products, there are still restrictions on automotive imports in some countries (some of which are quite substantial). However, the main influence on the pattern of automotive trade is now the process whereby the multinational vehicle companies divide production among their subsidiaries. The development of such strategies is having a significant effect on Australian vehicle manufacturers, as they seek to establish themselves within the global strategies of their parent companies.

This Appendix discusses the international trading environment in which the automotive companies operate. It begins with a brief description of how world trade for all goods have changed over the past two decades. It then discusses the development of international trade agreements and Australia's commitments under the agreements it has signed. Lastly, it looks at the implications of trade agreements for Australian export opportunities, the current level of access to automotive export markets, and the prospects for improved access in the future.

I.2 World trade in goods

World trade in merchandise products has changed significantly over the last 25 years. In almost every year, trade has grown faster than output over this time. Trading patterns have also changed. Between 1970 and 1992, Asia almost doubled its share of global trade — from 14 per cent in 1970 to 21 per cent in 1980 and 27 per cent in 1992 (OECD 1995c) — to become the second largest trading region, after Europe. The share of world trade decreased for every other region, except the Middle East, which fluctuated due to changing oil prices and political stability. These changes are shown in Table I.1.

Table I.1: **Share of each region in world merchandise trade[a]** (per cent)

	1970	*1980*	*1992*
Europe	54.2	47.6	46.9
Asia	14.1	20.9	27.0
Americas	22.6	18.8	19.4
Middle East	2.6	6.9	3.1
Africa	4.4	4.5	2.2
Oceania	2.1	1.3	1.4

a Includes intra-regional trade.
Source: OECD (1995c, p. 29).

Table I.2: **Inter-regional merchandise trade, 1972 and 1992** (per cent)

1972					
Destination: *Origin:*	*Americas*	*Europe*[a]	*Japan*	*Asia*[b]	*Other Regions*
NAFTA[c]	50.3	25.7	8.5	7.1	8.6
EU and EFTA	13.4	70.9	1.1	2.6	12.1
Japan	41.7	17.4		24.5	16.3
Other East Asia[d]	33.8	18.6	19.0	21.7	6.9
1992					
Destination: *Origin:*	*Americas*	*Europe*[a]	*Japan*	*Asia*[b]	*Other Regions*
NAFTA[c]	48.6	22.0	9.0	13.1	7.2
EU and EFTA	9.5	74.6	1.9	4.9	9.0
Japan	34.9	21.6		34.5	9.0
Other East Asia[d]	24.7	16.5	13.7	37.9	7.2

a The EU, European Free Trade Association (EFTA, comprising Iceland, Liechtenstein, Norway and Switzerland), Central and Eastern European countries and the Newly Independent States of the former Soviet Union (NIS). Includes intra-EU and intra-EFTA trade.
b Includes all of the Asian continent except Japan, the Middle East and the NIS.
c North American Free Trade Area (the United States, Canada and Mexico).
d Hong Kong, South Korea, Chinese Taipei, Singapore, Thailand, Indonesia, Malaysia, Brunei, The Philippines and China.
Source: OECD (1995c, p. 29).

The change in trading patterns has included a change in the patterns of inter-regional and intra-regional trade. Table I.2 shows the extent of inter-regional merchandise trade in 1972 and 1992. Over this period, the Americas were replaced by Asia as the major destination for East Asian exports. All other regions also increased the share of their exports destined for Asia. There was increased intra-regional trade in Europe, which generally came at the expense of the share of its trade accounted for by non-Asian regions.

The pattern of automotive trade between OECD regions is shown in Appendix B.

Australia's trade in automotive products is discussed briefly in Chapter 7 and in greater detail in Appendix C. Both imports and exports of automotive products have increased significantly since 1985. Exports of automotive products to South Korea and New Zealand, in particular, increased between 1988 and 1995. New Zealand remained Australia's largest export market over the period, increasing its share of exports from 23 to 30 per cent. South Korea was Australia's seventh largest export market in 1988, accounting for 4 per cent of exports. This increased to 13 per cent in 1995, making it Australia's second largest export market in that year.

Over 22 000 vehicles have been exported each year from 1990 to 1996. In 1996 almost 40 000 vehicles were exported, increasing from around 23 000 in 1995. This compares to a fluctuating level between almost 1900 and just over 10 000 between 1985 and 1989. The value of component and knocked-down vehicle exports between 1985 and 1996 increased from almost $700 million to over $1.3 billion.

Imports of vehicles increased by over 100 000 units between 1985 and 1996, although they fell substantially between 1986 and 1988. Component imports fluctuated, their value increasing from almost $3.8 billion to around $6.2 billion between 1988 and 1996.

I.3 International trade agreements

The increase in world trade has been encouraged by decreases in trade barriers worldwide. Over the past two decades there has been increasing pressure within the global community for all countries to reduce their trade barriers. Bilateral and multilateral agreements have been signed, customs unions and free trade areas formed or extended, and formal links established between the major trading regions (Europe, North America and East Asia). In addition, the markets for investment and financial services have seen significant liberalisation and internationalisation.

I.3.1 The General Agreement on Tariffs and Trade and the World Trade Organization

The most significant international trade agreement is the General Agreement on Tariffs and Trade (GATT), now one of the World Trade Organization (WTO) suite of trade agreements. A series of negotiations have refined and expanded the GATT since its inception in 1947. Initially established to reduce trade barriers from the very high levels of the 1930s, the first few rounds of negotiations saw the tariffication of quantitative non-tariff barriers and resulted in a significant reduction of tariffs. More recently, other non-tariff barriers have received greater attention. In December 1996, the WTO had 128 members, including almost all of the world's most powerful trading nations. The accession applications of almost 30 countries are currently under consideration.

The GATT 1994 (amending GATT 1947) is one of several agreements reached in the Uruguay Round of Trade Negotiations which concluded in April 1994. The WTO, which commenced operation on 1 January 1995, was established as the international organisation responsible for administering the GATT 1994, and the other Uruguay Round agreements, and provides a forum for dispute settlement and future negotiations.

Under GATT, signatories provide commitments on tariffs in the form of tariff 'bindings'. That is, countries commit to not raising a tariff above a specified (negotiated) level. A bound rate may be below, at or above pre-existing applied rates. Thus, one cannot determine the applied tariff rates for WTO members from their GATT 1994 commitments. However, the number of products covered by tariff bindings has been increased substantially by many countries and bound rates have generally been reduced. The trade weighted average bound tariff of OECD countries on industrial products will be 3.8 per cent once the Uruguay Round commitments are fully implemented.

In addition to the tariff negotiations, the Uruguay Round resulted in a number of Understandings and Agreements — some to fold products back into GATT coverage (for example, agriculture and textiles), others to develop trade rules in new areas (for example, in services and government procurement). There are several GATT disciplines which may affect the international trading environment of the automotive industry. These include:

- the Agreement on Technical Barriers to Trade;
- the Agreement on Subsidies and Countervailing Measures;

- the Agreement on Trade Related Investment Measures;
- the Agreement on Import Licensing Procedures;
- the Agreement on Implementation of Article VI (Anti-Dumping); and
- the Agreement on Government Procurement.[1]

Agreement on Technical Barriers to Trade

The new Agreement, arising out of the Uruguay Round, extends and clarifies the Agreement on Technical Barriers to Trade reached in the Tokyo Round (1973 to 1979). Essentially, the Agreement covers three major areas: the adoption of technical regulations and standards; conformity assessment, testing and notification; and transparency (Hoekman and Kostecki 1995).

Under the Agreement, countries must use international standards where these are appropriate. It also encourages use of performance measures where possible. In addition, 'In principle, WTO members are to join and use international systems for conformity assessment' (Hoekman and Kostecki 1995, p. 116). An importing country must accept the results of conformity assessment in an exporting country if, after consultation, conformity assessment procedures are determined to be equivalent between the countries.

The Agreement recognises that countries have the right to establish rules for environmental protection at levels they consider appropriate (for example for human, animal or plant life or health or the environment). With respect to their effects on international trade, the means by which these objectives may be met are constrained by Article XX of GATT 1994 and by the Agreement on Sanitary and Phytosanitary Measures.

A Code of Good Practice for the Preparation, Adoption and Application of Standards by standardising bodies is included as an annex to the Agreement. Each member is also required to establish an 'enquiry point' to answer enquiries and provide documentation to interested parties.

Agreement on Subsidies and Countervailing Measures

The Agreement on Subsidies and Countervailing Measures (SCM) strengthens the definition of a subsidy. Only specific subsidies (for the most part, subsidies available only to an enterprise or industry, or group of enterprises or industries) would be subject to the disciplines set out in the agreement. The Agreement classifies subsidies into three categories:

[1] Australia is not a signatory of the Agreement on Government Procurement.

- Prohibited subsidies are subsidies contingent upon export performance, or on the use of domestic inputs over imported goods. All such subsidies are deemed to be specific. Any export subsidy, whether offered by a national or sub-national government, is prohibited. Subsidies related to import substitution are also prohibited, to the extent that they take the form of domestic content requirements.
- Actionable subsidies are specific subsidies which are not prohibited, but which cause adverse trade effects. An example is when a production subsidy (through its effects on exports) causes material injury to the domestic industry in the importing country, 'serious prejudice' to the interests of another member, or nullification or impairment of benefits to another member.
- Non-actionable subsidies are specified in a 'positive' list or 'green box' of subsidies. They can be either subsidies that are not specific to certain enterprises or specific subsidies for research activities, regional development or environmental requirements. For each of these activities, detailed limits on the use of such subsidies are provided.

With regard to actionable subsidies, 'serious prejudice' is deemed to exist for certain subsidies, including when the total *ad valorem* subsidisation of a product exceeds 5 per cent. In such a situation, the burden of proof is on the subsidising member to show that the subsidies in question do not cause serious prejudice to the complaining member.

Some participants (for example, Mitsubishi, sub. 204) appear to be under the impression that subsidies are not actionable under the serious prejudice criterion if they provide total *ad valorem* subsidisation of less than 5 per cent. This is not the case. The fact that such subsidies are not *presumed* to cause serious prejudice to another member means that the burden of proof for serious prejudice lies with the complaining member rather than the subsidising member. Hence, such subsidies may still be found to cause serious prejudice. Furthermore, a subsidy may be actionable even if it does not cause serious prejudice, if it results in material injury to the domestic industry in an importing country, or nullification or impairment of benefits to another member. Indeed, most actions are brought by countries which claim that a subsidy provided by another member is causing material injury to a domestic industry.

The Agreement on SCM requires that each member annually notify the SCM Committee of all the subsidies that it maintains. One main feature of the Agreement is an expedited timetable for action by the Dispute Settlement body.

If a member complains about a subsidy applied by another member, and it is found that the subsidy is indeed prohibited, it must be withdrawn. If this is not done within the specified time period, the complaining member may receive compensation or be authorised to take retaliatory action, such as the selective removal of concessions on products imported from the offending country.

If members consider that they are adversely affected by an actionable subsidy offered by another member, they may refer the matter to the Dispute Settlement body. If it is determined that such adverse effects exist, the subsidising member must take action to withdraw the subsidy or remove the adverse effects. If this is not done within six months, the complaining member may impose countermeasures, including countervailing duties, ‘commensurate with the degree and nature of the adverse effects’ (WTO 1996b).

Agricultural products are excluded from the Agreement on Subsidies and Countervailing Measures.

Agreement on Trade-Related Investment Measures (TRIMS)

This Agreement applies to a narrow range of trade-related investment measures affecting goods only. It recognises that certain measures restrict and distort trade, and sets out a list of measures deemed to be inconsistent with members’ obligations to provide national treatment and to eliminate quantitative restrictions under the GATT. This list is appended to the agreement and includes measures which require particular levels of local procurement by an enterprise (‘local content requirements’).

The following TRIMs are deemed to be inconsistent with Articles of the GATT 1994:

> 1. TRIMs ... compliance with which is necessary to obtain an advantage, and which require:
>
> > (a) the purchase or use by an enterprise of products of domestic origin or from any domestic source, ...; or
> >
> > (b) that an enterprise’s purchases or use of imported products be limited to an amount related to the volume or value of local products that it exports.

2. TRIMs ... compliance with which is necessary to obtain an advantage, and which restrict:

(a) the importation by an enterprise of products used in or related to its local production, generally or to an amount related to the volume or value of local production that it exports;

(b) the importation by an enterprise of products used in or related to its local production by restricting its access to foreign exchange to an amount related to the foreign exchange inflows attributable to the enterprise; or

(c) the exportation or sale for export by an enterprise of products ... .

The Agreement requires notification of all non-conforming TRIMs and their elimination within two years (for developed countries). The WTO dispute settlement mechanisms apply to this Agreement. Review of the operation of the Agreement is to take place five years after its entry into force.

Agreement on Import Licensing Procedures

The revised Agreement on Import Licensing Procedures strengthens the disciplines on the users of import licensing systems and increases transparency and predictability. For example, the Agreement requires parties to publish sufficient information for traders to know the basis on which licences are granted. It also contains strengthened rules regarding the notification of the import licensing procedures and any changes that are made.

The Agreement sets out criteria under which automatic licensing procedures are assumed not to have trade restrictive effects. It states that the administrative burden for importers and exporters of non-automatic licensing procedures should be limited to what is absolutely necessary. The revised agreement also sets a maximum of 60 days for applications to be considered.

Agreement on Implementation of Article VI (Anti-Dumping)

Article VI of the GATT provides members with the right to apply anti-dumping measures — that is, measures against imported products being sold at a price below their ‘normal value’.[2] This right only exists, however, if dumped imports cause injury, or threaten to cause injury, to a domestic industry producing like goods in the importing country — or if they materially hinder the establishment of such an industry. The Agreement negotiated in the Uruguay Round revised the Tokyo Round Anti-Dumping Agreement, making it more detailed and precise.

[2] Usually if goods are exported at a price below the price of the product sold in the normal course of trade in the exporting country. Failing this, the price of the product sold in the normal course of trade in a third country, or the cost of production including an adequate margin for profit. (IC 1995e)

The Agreement strengthens the requirement for the importing country to establish a clear causal relationship between dumped imports and injury to the domestic industry. It also establishes clear-cut procedures on how anti-dumping cases are to be initiated and how such investigations are to be conducted. The Agreement calls for prompt and detailed notification of all preliminary or final anti-dumping actions to a Committee on Anti-Dumping Practices.

Agreement on Government Procurement

The Agreement on Government Procurement is one of the four agreements under the WTO which members of the WTO can choose whether or not to sign. Australia is not currently a signatory.

Under the Agreement, signatory governments must not treat domestic products, services and suppliers (in areas covered by the Agreement) more favourably than products, services and suppliers from other parties to the Agreement. The Agreement is based on the principles of national treatment, non-discrimination and transparency at every step of the national tendering process. It does allow, however, for discrimination against suppliers from countries which have not signed.

The Agreement prohibits 'offsets' — that is, measures to encourage local development, local content, licensing of technology, investments or countertrade requirements.

The Agreement generally covers procurement by entities of central governments of goods and associated services (above threshold levels), unless they are specifically excluded. Procurement of goods and services by State and local authorities, and of services by central governments, are generally covered only if they are specifically listed.

Countries negotiate many of the commitments on a reciprocal basis with other members of the Agreement. This means that signatories may confine access opportunities in certain areas of their government markets only to those countries with which they have negotiated similar access. Exemptions can be applied to the layers of government, all or specified GBEs and government agencies, or to industry sectors which are considered by the signing country to be 'sensitive sectors' (for example, defence or telecommunications). If a country excludes an area, it may then lose access to this area in some or all other countries which are parties to the Agreement.

At present, the United States is the only country that discriminates under law against non-members of the Agreement. It prohibits the procurement of products from countries that are not signatories to the Agreement for federal goods contracts above Agreement thresholds.

The Agreement provides for challenge procedures for foreign suppliers where these suppliers feel that they have been discriminated against. These procedures may not be accessible — and would not be accessible as a right — to non-member countries.

I.3.2 Asia Pacific Economic Cooperation (APEC)

The Asia Pacific Economic Cooperation forum (APEC) comprises 18 member countries — Australia, Brunei, Canada, Chile, China, Chinese Taipei (Taiwan), Hong Kong, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, The Philippines, Singapore, South Korea, Thailand and the US. Ministerial meetings are conducted each year, in addition to annual Leaders' meetings. Box I.1 describes how APEC operates. Its structure is shown in Figure I.1.

One of the principles on which APEC is based is that of 'open regionalism', defined by the Eminent Persons Group (APEC 1994b) as:

> ... a process of regional cooperation whose outcome is not only the actual reduction of internal (intra-regional) barriers to economic interaction but also the actual reduction of external barriers to economies not part of the regional enterprise; ... (p. 2)

Hence, APEC is a forum for encouraging unilateral and multilateral trade liberalisation toward all countries, rather than a trading bloc, the members of which provide preferential treatment to one another.

The *Osaka Action Agenda: Implementation of the Bogor Declaration* was adopted by the APEC Leaders in November 1995. This document outlines the General Principles to be applied to the APEC liberalisation and facilitation process. Among these are the principles of 'comprehensiveness' and 'non-discrimination':

> The APEC liberalization and facilitation process will be comprehensive, addressing all impediments to achieving the long-term goal of free and open trade and investment.
>
> ...
>
> APEC economies will apply or endeavour to apply the principle of non-discrimination between and among them in the process of liberalization and facilitation of trade and investment. The outcome of trade and investment liberalization in the Asia-Pacific region will be the actual reduction of barriers not only among APEC economies but also between APEC economies and non-APEC economies. (APEC 1995, p. 1)

Box I.1: **How does APEC work?**

‘APEC does not operate within a formal, legal framework as the European Union or NAFTA do, for example. Its agreements are forged through consultation and consensus rather than direct negotiation.

The APEC Chair rotates annually among all members. Canada is Chair in 1997, to be followed by Malaysia in 1998 and New Zealand in 1999.

At the top of APEC’s organisational structure are informal meetings of *APEC Economic Leaders*. Four such meetings have been held to date, Seattle (US) in 1993, Bogor (Indonesia) in 1994, Osaka (Japan) in 1995 and Manila (Philippines) in 1996. The Vancouver (Canada) meeting will be the fifth. These meetings provide an opportunity for the Leaders of APEC economies to share their vision for the future of the Asia-Pacific region and to chart APEC’s long term development.

The annual *Ministerial Meeting* (generally attended by foreign or trade ministers) approves APEC’s work program and budget, makes decisions on policy questions such as APEC’s institutional structure and membership, and sets directions for the year ahead. Ministers report and make recommendations to Leaders on key policy issues and directions.

APEC *Senior Officials* meet regularly between the annual ministerial meetings. Unlike the WTO or the United Nations, APEC does not have permanent missions assigned to a headquarters and formally accredited to the organisation. In the absence of such arrangements, regular senior officials’ meetings provide the main opportunities to implement ministerial decisions and prepare recommendations for future meetings.’

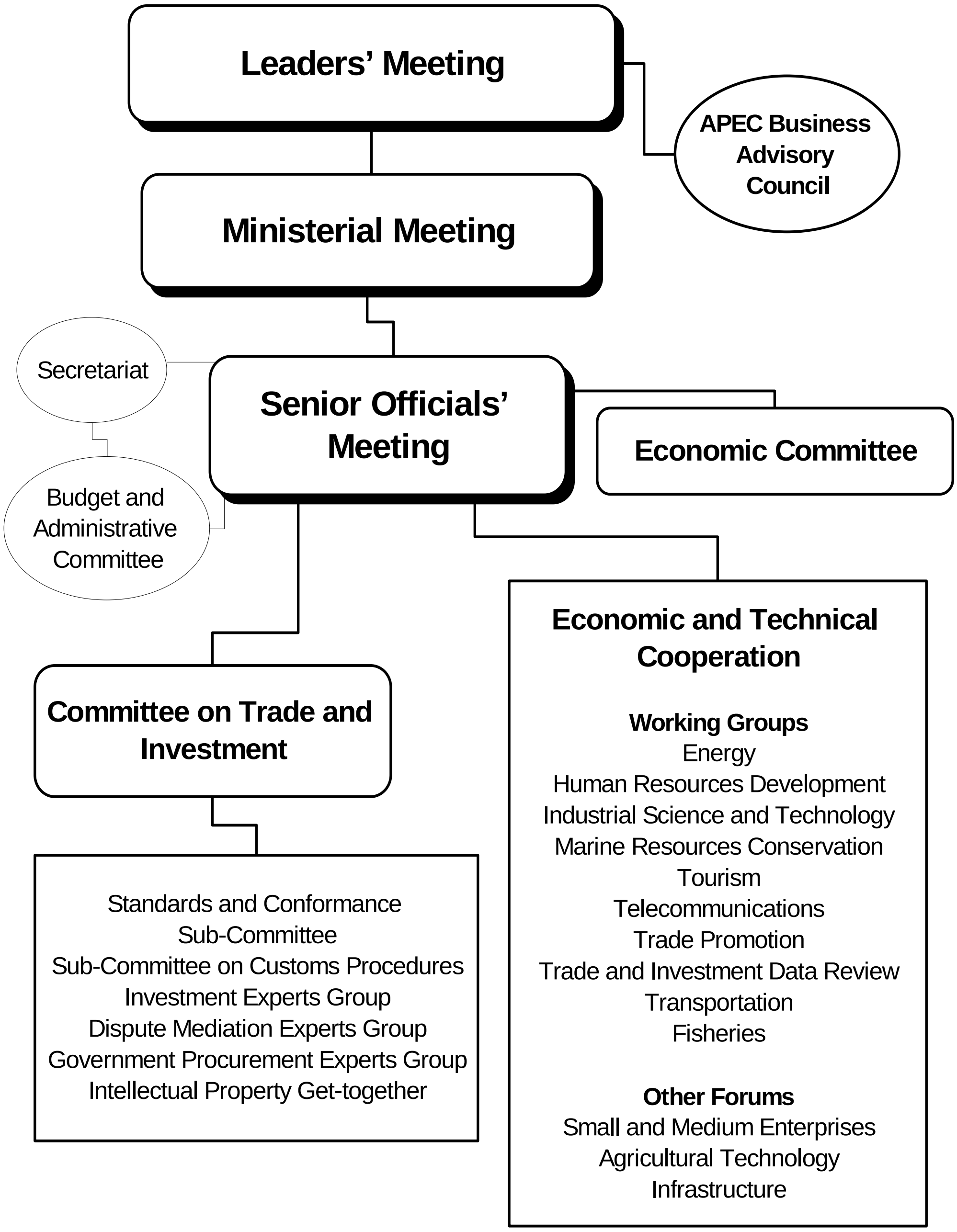
Source: DFAT (1997).

The broad timetable for APEC liberalisation was included in the APEC Economic Leaders’ Declaration of Common Resolve, which was finalised in November 1994 in Bogor, Indonesia. Under this declaration the leaders agreed to the goal of achieving ‘free and open trade’ in the region by 2020. The leaders further declared that:

> The pace of implementation will take into account the differing levels of economic development among APEC economies, with industrialized economies achieving the goal of free and open trade and investment no later than the year 2010 and developing economies no later than 2020. (APEC 1994a, p. 4)

There has been some debate about whether ‘free and open trade’ means absolutely zero tariffs on merchandise trade (Snape 1996b). Most commentators, however, have assumed that it does.

Figure I.1: **APEC structure**



Source: DFAT (1997).

In May 1996, all 18 APEC countries submitted their initial strategies to achieve the free trade goal. When the Individual Action Plans were presented at the Leaders' meeting in Manila in November 1996, almost all APEC members' plans exceeded their WTO commitments to some extent. However, the Action Plans of all countries concentrate mainly on the implementation of existing commitments. The Department of Foreign Affairs and Trade (DFAT 1996d) stated that:

> The 1996 Action Plans capture members' existing multilateral and unilateral liberalisation commitments. In doing so, they harness the ongoing process of liberalisation in the region which has seen the simple average tariff in the region fall from 12 per cent in 1993 to 9 per cent in 1996. ...
>
> The plans also include new liberalisation initiatives which build on the progress already made. For example, China commits to reduce its simple average tariff from 23 per cent in 1996 to 15 per cent on 2000. (p. 1)

Members' 1996 Action Plans concentrate, for the most part, on the near to medium term, giving broad policy direction for the longer term — toward 2010 and 2020. However, plans will be updated annually, providing more specific information and commitments for the medium to longer term. (DFAT 1996d)

It should be noted that the commitments made in these Action Plans are different to those made under the WTO. APEC commitments are undertakings by individual countries on the unilateral liberalisation they plan to pursue. They are not generally the result of negotiations, and cannot be enforced by other members. However, the annual meetings of Economic Leaders and trade or foreign ministers serve to strengthen political support for unilateral liberalisation. The process is described as 'concerted unilateral liberalisation'. The commitments made by APEC countries with regard to protection of the automotive industry are discussed in Section I.6.

I.3.3 Other trade arrangements

The Association of Southeast Asian Nations and the ASEAN Free Trade Area

The Association of Southeast Asian Nations (ASEAN) was formed in 1967. The original members of the group are Singapore, Thailand, The Philippines, Malaysia, Indonesia and Brunei. Vietnam became the seventh ASEAN member in July 1995. Cambodia and Laos were expected to join in 1997, although no decision has yet been made regarding the exact timing. Myanmar (Burma) is also expected to be considered for membership within the next few years.

ASEAN initially focused on political and security issues (DFAT 1994). However, Snape, Adams and Morgan (1993) noted that:

> The end of the Cold War has dissolved the common external threat which brought ASEAN together in 1967, leaving economic factors to come to the fore as the binding force of the association. (p. 93)

The original members agreed to form the ASEAN Free Trade Area (AFTA) at the Fourth ASEAN Summit in Singapore in 1992. It was agreed at the summit that AFTA be established within 15 years. Prior to this agreement, the ASEAN countries had already established the Preferential Tariff Arrangements in 1977, which provided 25 to 50 per cent tariff reduction on items originating in other ASEAN states. However, only about 5 per cent of intra-ASEAN trade was covered by the arrangements, due to liberal exercise of the right to exclude sensitive products. (Snape *et al*. 1993)

In order to be eligible for reduced tariffs under AFTA, products must contain at least 40 per cent ASEAN content. The original aim of AFTA was to have a maximum tariff rate of 5 per cent by 2008, and to phase out non-tariff barriers by 1998 (Snape *et al*. 1993). The 2008 deadline has now been brought forward, with the six core ASEAN countries planning the completion of their tariff cuts by 2003, while Vietnam has until 2006 to phase in the preferential tariff schedule (Richardson 1996).

The European Union

The first major step toward the formation of the European Union (EU) was taken in 1957 with the creation of the European Economic Community (EEC). The original members of the EEC were Belgium, the Federal Republic of Germany, France, Italy, Luxembourg and the Netherlands. Their aim was to ‘reduce barriers to internal trade through the creation of a “common market”’ (Snape *et al*. 1993).

The original EEC membership of six has now been expanded to 15, by the addition of Austria, Denmark, Finland, Greece, Ireland, Portugal, Spain, Sweden and the UK. It has progressed to form a Single Market, with a single external trade policy for nearly all products and free movement of services, capital and people internally. A common currency (the ECU) is due for introduction in 1997 or 1999 (depending on member states meeting specified criteria). The EU has also ‘provided the hub for many networks of preferential trading agreements with other countries’ (Snape 1996a).

The Asia–Europe Meeting

The first Asia-Europe Meeting (ASEM) was held in Thailand in March 1996. The meeting was attended by the Heads of Government of the 15 EU countries and those of many major Asian nations. Neither Australia nor New Zealand was invited to join ASEM.

Included in the wide range of issues discussed were the issues of trade and investment liberalisation. The Meeting resolved that the ASEM process should 'complement and reinforce efforts to strengthen the open and rules-based trading system embodied in the WTO' (ASEM 1996, pp. 2–3). However, it also agreed:

> ... to undertake facilitation and liberalisation measures involving the simplification and improvement of customs procedures, and standards conformance. ASEM will also aim for the reduction in trade barriers to avoid trade distortion and create better market access thus encouraging greater trade flows between Asia and Europe. (p. 3)

An Informal Senior Officials' meeting was held in Brussels in July 1996 to discuss ways in which these aims can be achieved. The initial emphasis of this group was on WTO issues. (ASEM 1996)

The second ASEM is planned for 1998 in the United Kingdom, with a third to be held in the South Korea in 2000.

The North American Free Trade Agreement

The North American Free Trade Agreement (NAFTA) is an agreement between Canada, the US and Mexico. It came into effect on 1 January 1994, extending the Canada–US Free Trade Agreement. Full phasing in of NAFTA will take 15 years, by which time there should be free trade in most goods between the NAFTA countries. (OECD 1996a, Snape 1996a)

Rules of origin are very strictly defined under NAFTA, particularly for automotive products. In order to qualify under these rules, from 1994 to 1997, at least 50 per cent of a vehicle's net cost 'must be of value originating in North America' (OECD 1996a). This value will increase to 56 per cent in 1998, and will reach 62.5 per cent in 2002. In addition to this net amount, 'key foreign components will be "traced" to measure their own North American content' (Hufbauer and Schott 1993, p. 41). This tracing rule will apply to 69 specified parts, with the value of foreign content in these parts subtracted when calculating the net cost of the vehicle. The administrative complication involved with the tracing process increases the incentive for North American assemblers to use North American content.

The Australia New Zealand Closer Economic Relations Trade Agreement

The Australia New Zealand Closer Economic Relations Trade Agreement (ANZCERTA) came into force on 1 January 1983, replacing the New Zealand Australia Free Trade Agreement. Under ANZCERTA, bilateral trade in all products originating in the two countries is free of tariffs, quantitative restrictions, anti-dumping measures and safeguard measures (except in certain cases, such as those of overriding national interest). All export subsidies and export incentives on goods traded between the countries have also been eliminated under the Agreement.

Australia and New Zealand have adopted a 'negative list' approach, whereby all goods and services are subject to free trade unless they are mentioned specifically in an annex to the agreement.

In order to qualify for duty free trade between Australia and New Zealand under ANZCERTA, goods must contain 50 per cent area content. The New Zealand Automotive Component Manufacturers' Federation has suggested that this requirement be eased for motor vehicles, an issue that is discussed in Chapter 7.

Other agreements

There are many other preferential trade arrangements in place worldwide. The following list is not comprehensive, but gives an indication of the number of agreements currently in place.

- the Common Market of the Southern Cone (Mercosur);
- the Andean Pact;
- the Caribbean Common Market;
- the European Economic Area;
- the European Free Trade Association;
- the West African Economic Community;
- the Central European Free Trade Agreement;
- the African, Caribbean and Pacific Group of States;
- the Gulf Co-operation Council;
- the Central African Customs and Economic Union; and
- the Arab Maghreb Union.

I.4 Australia's obligations and commitments under international trade agreements

Australia is a signatory to a number of international trade agreements which restrict the assistance that the Commonwealth, State, Territory and local governments can provide to the automotive industry, through both tariff and non-tariff means. The most significant of these are the Agreements resulting from the Uruguay Round, including the GATT 1994.

I.4.1 Tariff commitments

Australia has made tariff commitments under both the GATT 1994 and APEC although, as noted above, the type of commitment under each arrangement is different.

Under the GATT 1994, Australia has committed to a bound tariff rate on passenger motor vehicles of 40 per cent, while the rates on components are bound at 25 per cent for original equipment, and 15 per cent for replacement parts and accessories. The bound rates on chassis fitted with engines are 25 per cent if they are for use in assembly or manufacture, and 40 per cent otherwise. The bound rates on passenger vehicle bodies are 25 per cent on those used for assembly or manufacture of vehicles, and 15 per cent otherwise.

Australia has submitted its Individual Action Plan to APEC, detailing the current tariff reductions for the automotive industry, and stating that this Industry Commission review is under way. As a developed country, it is committed to achieving free and open trade by 2010.

I.4.2 Non-tariff commitments

WTO/GATT

As a signatory to GATT 1994 and a member of the WTO, Australia is bound by its rules on non-tariff measures. Except for the Agreement on Government Procurement, which Australia has not yet signed, the Agreements described in Section I.3.1 all affect the non-tariff measures Australia can take. In particular, the Agreement on Subsidies and Countervailing Measures limits the measures Australia can take to protect or assist its domestic producers of non-agricultural products.

Australia is required, under the Agreement on Subsidies and Countervailing Measures, to remove any export subsidies on motor vehicles and components. Australia did not notify the WTO of its export facilitation scheme as an export subsidy, and therefore has not so far been required to remove the assistance within a specified time frame. However, the scheme is vulnerable to challenge, as evidenced by the recent Howe Leather case (see Chapter 8). If an announcement is made to retain the EFS beyond 2000, it is likely that it will again come under challenge in the WTO.

Direct production subsidies to the industry (such as a bounty) would not be prohibited under the Agreement, but would be classed as actionable. That is, if the subsidy were found to be causing material injury to the domestic industry of another country (through reducing the price of Australia's exports), or causing 'serious prejudice' or nullification or impairment of benefits to another member, that member could take countervailing action against Australia's automotive exports.

Local content requirements are prohibited under the Agreement on Trade-Related Investment Measures. Australia's local content scheme for motor vehicles was abolished in 1988.

ANZCERTA

In 1988, a review of ANZCERTA resulted in the Agreed Minute on Industry Assistance which committed Australia and New Zealand to avoid industry assistance for most industries which directly affected trans-Tasman trade. Australia initially excluded its Export Facilitation Scheme for passenger motor vehicles from the Agreed Minute but this exemption was later removed (BIE 1995c), resulting in credits being unavailable on most automotive products exported to New Zealand. The Minute included a commitment by both countries to take account of the views of the other government before finalising any decision to adopt industry-specific measures that could adversely affect trans-Tasman trade (for example, subsidies to specific industry sectors).

In the 1990 review of the ANZCERTA, both governments agreed not to pay production bounties or like measures on goods which are exported to the other country. In addition, it was agreed that from 1 January 1989, each government would endeavour to avoid the adoption of industry-specific measures which have adverse effects on competition between industries in the Free Trade Area. Some exemptions were provided for, such as measures to support research and development, extension services, and export promotion measures other than those specifically designated for elimination (DFAT 1991).

New Zealand is also a signatory to the Australia and New Zealand Government Procurement Agreement, which was established to eliminate the application of preferences based on State of origin in State Government procurements in Australia. This means that goods of New Zealand origin are treated the same way as Australian goods in State Government procurement processes. Most States no longer apply Australia New Zealand preferences on most goods, but the purchase of motor vehicles is one of the remaining areas where these preferences are applied by many States.

I.5 Implications of international trade agreements for Australia's automotive export opportunities

Many of the recent trade agreements have improved Australia's trading position, reducing barriers to the importation of Australian products. However, it has been claimed that the formation of free trade areas which do not include Australia may jeopardise some export markets. This may be the case if the formation of a free trade area reduces the relative attractiveness of Australian products, compared to those of a new free trade partner.

I.5.1 Trade arrangements which include Australia

The trade arrangements to which Australia is party are providing increased access for Australian products to the markets of other members. The three major arrangements are the GATT/WTO, APEC and ANZCERTA.

ANZCERTA has led to increased trade between Australia and New Zealand, and has in fact provided Australia with some advantage over its competitors in exporting automotive products to New Zealand. This advantage is declining as New Zealand's tariff rate falls. The advantage to New Zealand producers in the Australian market has not been as marked, due to the inability of New Zealand's motor vehicle manufacturers to meet the 50 per cent area content requirement for duty free entry.

Under the GATT 1994 and APEC, all members have committed to liberalisation of their trade barriers, although the nature of the commitments under the two arrangements is very different. In many cases, reductions in non-tariff barriers will be more significant than tariff reductions.

More countries are in the process of becoming WTO members. For example, China has applied for membership and its accession is being considered. The accession of new members to the WTO will lead to further reduction in trade barriers.

I.5.2 Trade agreements which do not include Australia

AFTA

The ASEAN countries are moving quickly toward the development of the ASEAN Free Trade Area. However, it is unclear how far intra-ASEAN trade barriers will fall over the medium term, and whether the reductions in barriers to ASEAN partners will be accompanied by reductions in barriers to other countries. Unlike APEC, AFTA is not based on the concept of 'open regionalism'. However, AFTA countries have so far reduced their trade barriers in a non-discriminatory manner (that is, without giving preference to their AFTA partners).

If ASEAN countries do lower their (often significant) trade barriers toward one another only, it is likely that this will cause some diversion of trade away from non-ASEAN countries, such as Australia. Snape *et al.* (1993) make this point:

> ... as ASEAN increases its manufacturing base there should be increased scope for intra-industry trade which would be greatly facilitated by an elimination of high trade barriers within ASEAN. ... If barriers remain high to the outside, sourcing decisions will be skewed against component suppliers such as Australia. (p. 94)

This effect could be particularly significant for products such as motor vehicles and components, which are currently heavily protected in many ASEAN countries. By the same token, however, the ASEAN countries with high barriers on these products are not currently significant automotive producers and are mostly attempting to develop their own motor vehicle industries. This indicates that they may be reluctant to open these markets to even their ASEAN partners.

NAFTA

In 1995, around 10 per cent of Australia's PMV and component exports went to the US, while the share of exports to Canada and Mexico was negligible. The US market is already dominated by products originating in the US and Canada. Hence, given the prior existence of the Canada–US Free Trade Agreement, it seems unlikely that NAFTA will have a substantial effect on Australia's ability to export PMVs and components to the three member countries.

However, the strict rules of origin for motor vehicles discussed in Section I.3.3 may result in a distortion of component sourcing away from non-NAFTA countries, including Australia. This may serve to offset the benefits from the reduction in Mexico's trade barriers that have accompanied the introduction of NAFTA.

The EU

Until 1993, six of the EU member states had voluntary restraint arrangements with Japan on the importation of motor vehicles. While these country-by-country restrictions are now disallowed within the EU, they have been replaced with an agreement between the EU and Japan to monitor the Japanese penetration of the European vehicle market. This arrangement contemplated an increase in the share of Japanese imports to 16 per cent of the market by 1999. Imports of Japanese vehicles to France, Italy, Portugal, Spain and the United

Kingdom are specifically restricted under the arrangement. According to Snape *et al*. (1993), while it is unlikely that the EU's quantitative restrictions will have a significant direct effect on Australia:

> The restrictions on Japanese motor vehicle exports to Europe may reduce the demand for components produced in Australia, and affect the decisions of Japanese producers about investments in Australia. (p. 69)

Other agreements

The only other trade arrangements to which Australia is not party that may affect Australia's automotive trading opportunities is Mercosur. Since the introduction of the Agreement between Argentina, Brazil, Paraguay and Uruguay in 1991, intra-regional trade has grown substantially. While Mercosur is generally seen to be more trade-creating than trade-diverting, Reid (1996) commented that:

> Some of the rise in trade within Mercosur represents a diversion of trade from outside sources: for instance, the sale of cars between Brazil and Argentina ... (p. 6)

Wolf (1996) reported that the share of vehicles and machinery in intra-Mercosur trade has increased from just over 16 per cent in 1984 to 1986, to almost 31 per cent in 1994.

I.6 Access to automotive export markets

There are a number of factors affecting the export opportunities of Australian vehicle and component manufacturers. While the competitiveness of Australian products is the largest determinant of their export success, the global segmentation of the automotive market and the sourcing decisions of multinational automotive companies also affect Australian manufacturers. In addition, trade barriers erected in other countries can reduce the competitiveness of Australian exports in these markets.

The following section details the current tariff and non-tariff barriers in Asia, the Americas, Europe, and other selected markets. Section I.5.2 then looks at the progress that has been made over the last decade in reducing these barriers and the prospects for further improvements in access to automotive markets.

I.6.1 Current access to automotive markets

Access to automotive markets varies substantially between countries. In many areas, there is little restriction on automotive imports. While there generally appear to be higher tariff and non-tariff barriers in Asia than in other parts of the world, many of these barriers have fallen substantially in the past decade.

The Department of Foreign Affairs and Trade (DFAT) has provided the Commission with information regarding trade barriers in APEC countries. Information on tariff and non-tariff barriers in a number of countries has also been sourced from the United States Trade Representative (USTR) *1996 National Trade Estimate*. In addition, the OECD Working Party of the Trade Committee recently produced a report on market access issues in the automotive industries following the Uruguay Round, which contains information on the trade barriers of OECD and some non-OECD countries (OECD 1996a).

Asia

Many countries in Asia provide significant tariff and non-tariff protection to their motor vehicle industries. The main exceptions to this are Singapore, Hong Kong and Japan, which account for about half of the Asian automotive market. Singapore and Hong Kong have little or no automotive manufacturing capability. In contrast, Japan has a well established automotive industry.

Import penetration in Japan has increased from almost nothing to around 8 per cent over the last decade. While it has zero tariffs and no official non-tariff barriers, Japan has traditionally been, and still is, a very difficult market to enter. Part of the reason for this is the difficulty in establishing a distribution chain, due to the expense and the fact that the distribution system varies significantly from that in most Western countries.

Table I.3 shows the size of the passenger motor vehicle markets in various Asian countries, the import penetration in those markets, and Australia's share of imports, where available. As the table shows, figures on Australia's share of imports were unavailable for most countries. For the countries for which import share was available, Australia's share of total imports is generally quite low. The Commission estimated that Australia's share of total ASEAN imports of passenger motor vehicles was around 2 per cent in 1995.

Table I.3: **Size of passenger motor vehicle markets in selected Asian countries, import penetration and Australia's share of passenger motor vehicle imports, 1995**

	Size of PMV market	*Import penetration*	*Australia's share of imports*
	no.	*%*	*%*
ASEAN	605 000	15	2
Brunei	141 371	100	na
Indonesia[a]	48 000	36	8

Malaysia	149 000	20	na
Philippines	71 000	12	na
Singapore	43 589	100	0.3
Thailand	161 000	34	na
China	321 000	11	0
Chinese Taipei	413 000	26	0
Hong Kong[b]	40 334	100	na
India	393 000	na	na
Japan	4 440 000	8	0.7
South Korea	1 149 000	1	0

a Austrade’s estimates of imports in the Indonesian market give measurements in metric ton. Thus, Australia’s share of imports is by weight.

b The market size and Australian share of imports figures for Hong Kong are for 1994.

Sources: EIU (1997), DFAT (1996b), Austrade (1997) and Commission estimates.

Asian tariff barriers

Tariff rates on motor vehicles and components in the Asian region are often high, although there is significant variation between countries. Table I.4 shows the tariff rates applied to products in the automotive sector, for selected East and Southeast Asian countries.

A number of arguments are used by some Asian countries to support their use of high tariff rates. Some developing economies argue that they apply high rates in order to protect their emerging domestic industries. However, Brunei, Chinese Taipei, Malaysia and Thailand apply rates varying with engine size. These rates are primarily applied for environmental reasons, to limit the sale of vehicles with larger engines, which tend to be less fuel efficient.

Table I.4: **Tariff rates on automotive products[a], selected Asian countries, 1997**

	Tariff on PMVs	*Tariff on parts*
	%	*%*
Brunei	40–200	20
China	100	6–50
Chinese Taipei	30–42	5–30
Hong Kong	0	0
India	50	50
Indonesia[b]	125 + 75	40–100
Japan	0	0
Malaysia[c]	42; 140–200	0–30
Philippines[c]	3; 40	3–30
Singapore	0	0
South Korea	8	8
Thailand[c]	20; 42–68.5	40
Vietnam[c]	7–40; 55	40–50

a All tariffs are ad valorem CIF.

b Indonesia applies a 75 per cent import surcharge as well as the tariff of 125 per cent. Indonesia's APEC Action Plan states that it announced a new package in June 1996, eliminating all surcharges on imported goods.

c The two ranges of tariff shown for Malaysia, The Philippines, Thailand and Vietnam indicate tariffs on: CKD kits; CBU PMVs.

Source: DFAT (1996b), USTR (1996) and DIST (1995a).

Asian non-tariff barriers

In many cases, non-tariff barriers provide greater protection to a domestic industry than tariff barriers. The two most significant forms of non-tariff barrier applied in Asian countries are:

- quantitative import restrictions (quotas and import bans); and
- restrictions on the right to import (including import licences).

There are currently some quotas affecting Australia, with some import bans having recently been removed.

Until recently, importation of Australian-made motor vehicles was prohibited in Chinese Taipei, under the present area restriction policy. This ban has now been replaced with a quota of 2000 units per annum, increasing to 6000 on Chinese Taipei's accession to the WTO (DFAT 1996b). Bans on the importation of completely built up PMVs into Thailand were also lifted recently, and there are now no quantitative restrictions in this market.

In China, most automotive products are subject to quotas, but quota details are unavailable to external sources.

South Korea applies a ban on the importation of automotive products from Japan under its Import Diversification Program. Under APEC, South Korea has announced its intention to eliminate this program by 1999.

According to the United States Trade Representative (USTR 1996), South Korea, China, India, Indonesia and Malaysia require importers to get licences in order to import vehicles or components. In the case of South Korea, licences for PMVs, parts and accessories are classified in the ‘automatic approval category’. However, import licensing can be a significant barrier to entry in other markets.

In China, PMVs can only be imported by Government organisations or foreign affiliated firms, and import licences are needed. These licences usually require approval from several Government agencies. In addition, foreign companies require specific site permit approval in order to import components, although fully Chinese-owned companies can import them.

Import licences are also used, along with various other requirements, in India, Indonesia and Malaysia. The details of how licensing arrangements are applied, and the extent to which they restrict imports, vary among these countries. In India, however, licensing arrangements have resulted in almost no importation of private passenger cars.

Participants have also commented on other ‘non-traditional’ barriers to automotive imports imposed by governments, particularly in Asia. For example, the existence of differentiated taxes depending on engine size disadvantages the larger vehicles made in Australia — although the tax may not be designed as a trade barrier. In addition, some countries differentiate their application of taxes on the basis of whether a product is imported.

FAPM also noted that ‘Barriers to market entry due to franchise regulations not applicable in our market are often cited as a major barrier to market access in potential markets’ (sub. 48, p. 22). Whether these can be considered a barrier to trade depends on the extent to which they discriminate against a foreign firm compared to, say, a new local entrant.

The Americas

Table I.5 summarises the tariff barriers currently applied in the Americas and the commitments on tariffs by 2000.

Table I.5: **Tariff barriers applied to automotive products and tariff commitments at 2000, the Americas** (per cent)

	Tariffs on PMVs	*Tariffs on parts*	*PMV tariff commitments at 2000*
Brazil	70.0		22.0
Canada	8.0	0–8.0	6.1
Chile	11.0	11.0[a]	
Mexico	20.0	0–20.0	20.0
The United States of America	2.5[b]	0–4.0	2.5

a Chile offers tariff concessions for original equipment imports.
b The United States applies a tariff on light trucks of 25 per cent.
Source: DFAT (1996b) and OECD (1996a).

There is a strong and well established domestic automotive industry in the US. The tariff rate for PMVs in the US is currently 2.5 per cent, while tariffs on components range from zero to 4 per cent (DFAT 1996b). The only segment of the automotive sector in the US which is subject to higher tariffs is the light trucks segment, which currently has a 25 per cent tariff (OECD 1996a).

Japan undertook voluntary export restraints on its exports of vehicles to the US from 1981 until March 1994 (OECD 1996a). While no longer officially in place, there appears to remain a political understanding limiting the import of Japanese vehicles to the US. These restraints have had a substantial effect on the level of direct investment by Japanese companies in the US, effectively forcing all of the Japanese companies to establish production facilities in the US. This may have affected Australian export opportunities indirectly, through a reduction in demand for Australian components for use in Japanese production.

Canada has steadily been reducing its tariff rates, with a current rate of 8 per cent on PMVs and zero to 8 per cent on parts (DFAT 1996b). The tariff rate on PMVs will be reduced to 6.1 per cent by 2000 (OECD 1996a).

Mexico formerly applied import restrictions and licences. Only manufacturers were allowed to import vehicles, and they were only ‘permitted to import vehicles equal to 15 per cent of their local production, provided that they meet other requirements relating to trade and foreign currency balances’ (OECD 1996a). These restrictions have now been removed (DFAT 1996b). The current tariff rate for automobiles in Mexico is 20 per cent, and this will remain until 2000. The current range of rates on components is zero to 20 per cent.

The current applied tariff on motor vehicles in Brazil is 70 per cent. This is to fall to 22 per cent by 2000 (OECD 1996a). The implementation of Mercosur appears to have been the major influence on Brazil’s pattern of trade in automotive products.

In Chile, both vehicles and components are subject to a tariff rate of 11 per cent, although there are tariff concessions for original equipment imports (DFAT 1996b).

Other markets

Tariff rates on automotive products are freely available for some markets, while they can be more difficult to determine for others. Table I.6 shows the tariff rates currently applied to passenger motor vehicles and parts, and those planned for 2000, for the EU, some non-EU European countries, Turkey, Saudi Arabia and South Africa.

The tariff rate for motor vehicles in the EU is currently 10 per cent, and it is to remain at this level until 2000. This rate applies to imports from most non-EU countries. The Czech Republic applies a tariff of 19 per cent, falling to 17.1 per cent in 2000. The tariff in Norway is now 5.3 per cent, but a zero tariff is planned for 2000. Switzerland applies a tariff of between 65 and 96 Fr per 100 kilograms, which will fall to between 15 and 96 Fr per 100 kilograms. The current tariff rate in Turkey is 25 per cent, falling to 19 per cent by 2000. (OECD 1996a)

Trade barriers vary between countries in the Middle East and, as a general rule, are established for revenue raising on those items which are not produced in significant quantities. There is little automotive production in the region. The tariff rate on vehicles in Saudi Arabia is 25 per cent (DFAT 1996b), although it appears that components enter duty free (arab.net 1996).

The Commission understands that a tariff rate of 61 per cent is applied to imports of PMVs and original equipment components in South Africa. This is planned to fall to 54 per cent in 1998, and 40 per cent in 2000. ARB Corporation (sub. 12) reported that tariffs on its products (shock absorbers, coil springs and leaf springs) are 5 per cent. There are no non-tariff barriers applied to imports of vehicles or components.

In Egypt, tariff rates have historically been relatively high. In March 1994, the maximum tariff rate was reduced to 70 per cent and the lower rate maintained at 5 per cent. While the Egyptian Government has failed to meet some of its commitments to the World Bank in regard to further tariff reductions, the maximum tariff was expected to fall to 50 per cent in late 1996. According to

USTR (1996), ‘High rates still apply to automobiles with engines larger than 1300cc’.

Table I.6: **Tariff barriers applied to automotive products and tariff commitments at 2000, Europe and other selected countries** (per cent)

	Tariffs on PMVs	*Tariffs on parts*	*PMV tariff planned for 2000*
EU	10.0	10.0	10.0
Czech Republic[a]	19.0		17.1
Norway[a, b]	5.3		0.0
Switzerland[a]	65–96 Fr per 100 kg		15–96 Fr per 100 kg
Turkey[a]	25.0		19.0
Saudi Arabia	25.0	0.0	
South Africa	61.0	5.0	40.0

a Applied tariff is at 1995 rate.

b Norway also applies an import tax on road motor vehicles, with a weight-based component of 50 per cent.

Source: OECD (1996a), USTR (1996), Ford (sub. 14) and ARB Corporation (sub. 12).

I.6.2 Progress in improving market access

Significant progress has been made over the past decade in reducing restrictions on trade worldwide. Table I.7 shows the reduction in the simple average applied tariff for all goods for APEC countries in 1988, 1993 and 1996. It should be noted that simple tariff averages can be quite misleading regarding the restrictiveness of tariff regimes.

On this measure, Australia reduced its tariffs by proportionately more than any other APEC country between 1988 and 1993. However, in 1993 it still had a higher average tariff than Brunei, Canada, Hong Kong, Japan, Singapore and the US. Of the ten APEC countries that had higher average tariffs than Australia in 1993, six reduced their tariffs proportionately more than Australia between 1993 and 1996. Chinese Taipei and Indonesia were the only Asian countries with higher barriers than Australia in 1993 that did not reduce their average tariffs more than Australia over this period.

While automotive products are often afforded special treatment in the reduction of trade barriers, they are increasingly being included in trade arrangements. In many markets, tariff and non-tariff barriers on automotive products have fallen along with reductions in barriers in other areas.

Some evidence of these reductions in relation to automotive products is provided by comparing the barriers identified by DIST (1995a) in mid-1995 to those applicable now, according to the latest DFAT figures. For example, the tariff rate in South Korea was identified by DIST as having fallen to 10 per cent from a previous higher level, and has now been further reduced to 8 per cent. Similarly, India has reduced its tariff on all automotive products from 65 per cent to 50 per cent. DIST also stated that Singapore applied a tariff on passenger motor vehicles of 45 per cent, which is now zero. Chinese Taipei's top rate of tariff has been reduced, while China's has fallen from 150 per cent to 100 per cent.

Table I.7: **Simple average applied tariff in the APEC region, 1988, 1993 and 1996**

	Simple average applied tariff		
	1988	*1993*	*1996*
Australia[a]	16	7	5
Brunei	4	4	2
Canada[a]	4	2	2
Chile	20	11	11
China	40	38	23
Chinese Taipei	13	9	9
Hong Kong	0	0	0
Indonesia	18	17	13
Japan[a]	4	3	4
South Korea	19	12	8
Malaysia	14	13	9
Mexico[a]	11	13	10
New Zealand	15	9	6
Philippines	28	24	16
Singapore	0	0	0
Thailand	31	38	17
United States[a]	4	4	3

a Denotes a trade weighted average.

Source: DFAT (1996d).

Under a Memorandum of Understanding with the United States, South Korea has agreed to reduce its vehicle registration tax and special excise tax on large-engine motor vehicles by an average of $2800 (Ford, sub. 203). In June 1995, the United States also signed an Agreement with Japan covering all aspects of bilateral automotive trade, the main objectives of which were to: improve access for US companies to the Japanese vehicle distribution system; eliminate regulations restricting access to the Japanese aftermarket; and improve opportunities for US original equipment suppliers in Japan and with Japanese transplants in the United States. These agreements, and in particular South Korea's commitments, have the potential to provide direct benefits to Australian producers. However, the explicit market sharing aspect of the US–Japan agreement may result in some distortion of trade away from Australian suppliers.

Some gains have been made in improving access to Asian markets for Australian suppliers through diplomatic channels. A recent example was the removal of Chinese Taipei's ban on imports of motor vehicles from Australia. Some participants have suggested that the Commonwealth Government could be more active in encouraging other countries to pursue further trade liberalisation. This is discussed in Chapter 7.

Barriers to entry of automotive products were not specifically mentioned in many APEC countries' Action Plans, while in some they were specifically excluded from commitments on tariff reductions. However, some APEC countries have committed to reductions in automotive trade barriers. The Philippines is planning to apply a tariff on passenger motor vehicles of 30 per cent by 2000, 20 per cent by 2003, and 5 per cent by 2004. Thailand is planning to eliminate its local content scheme in 1998, while South Korea will liberalise requirements for performance testing of vehicles which are only sold in small numbers, increasing the threshold from 500 vehicles to 1000 in 1998. Indonesia has stated that it will reduce its tariffs and surcharges by 2003 to a maximum 40 per cent tariff and 50 per cent surcharge on CBU vehicles and maximum 25 per cent tariff on CKD kits, with no surcharge, although it continues to promote its domestic industry aggressively.

Tables I.4 and I.5 (above) show the commitments on motor vehicle tariffs in 2000 that have been made in some non-Asian countries.

There is significant pressure on all countries to lower trade barriers to negligible levels within the next 20 years. This pressure comes from the establishment and expansion of multinational fora such as the WTO and APEC, as well as from within many countries where the benefits from free trade have been recognised.

J ENVIRONMENT AND SAFETY

J.1 Legislative framework

The principal legislation concerning vehicle safety and environmental impact is the *Motor Vehicle Standards Act 1989* (Cth). The motivation of the legislation was to consolidate State and Territory arrangements into a single system.

> The object of this Act is to achieve uniform vehicle standards to apply to road vehicles when they begin to be used in transport in Australia. *(s3) Motor Vehicle Standards Act 1989* (Cth)

Importantly, section 8 of the Act gives the Minister discretion to consult State and Territory authorities, organisations or persons involved in the industry, or vehicle users' representatives before determining national standards. The Minister also has power to determine procedures for testing vehicles under section 9.

The legislation imposes uniform national standards on all vehicles when first supplied to the market for use in transport. Vehicles failing to comply with the Act are not eligible for registration. Beyond first supply to the market, vehicle regulatory standards are determined by the States.

Broadly speaking, all the relevant standards that apply to vehicles are covered by Australian Design Rules (ADRs). ADRs govern three main areas: vehicle safety, environmental standards concerning emissions and noise and some highly specific regulations aimed at discouraging vehicle theft.[1] ADRs also impact on specific automotive components. For example, ADR 28/01 governs motor vehicle noise. As such it impacts directly on a number of vehicle components including mufflers and exhaust components.

Vehicle certification to the ADRs is administered by the Federal Office of Road Safety (FORS).

J.2 Vehicle emissions and fuel consumption targets

At present vehicle emissions and fuel consumption targets are addressed by a mix of mandatory standards and voluntary agreements. Vehicle emissions standards for new vehicles are prescribed by ADRs and fuel consumption

[1] Most notably, these ADRs encompass Vehicle Identification Numbers and Steering Locks.

targets are contained in a voluntary National Average Fuel Consumption Target (NAFC).

J.2.1 Vehicle emissions

Although the impact of atmospheric pollution varies from one location to the next, it is of particular concern in urban areas where local impacts can be potentially hazardous to health. It was claimed by a number of participants that motor vehicles are the main contributors to urban air pollution in Australia, for example the Department of the Environment, Sports and Territories (sub. 94, p. 1).

Table J.1 presents the relative contribution to urban atmospheric pollution in Australian cities from various sources including motor vehicle emissions.

Table J.1: **Relative contribution to atmospheric pollution in major Australian cities by source[a] (per cent)**

Source	*Carbon Monoxide*		*Hydrocarbons*		*Oxides of Nitrogen*	
	Average	*Range*	*Average*	*Range*	*Average*	*Range*
Motor vehicles	86	82-89	45	41-50	67	54-80
Other mobile	3	2-3	2	2-3	5	4-5
Waste combustion	1	1-2	1	1-2	<1	<1
Fuel combustion	7	4-12	10	6-16	21	9-34
Petroleum/solvent	<1	<1	35	30-38	4	2-5
Miscellaneous	2	<1-3	5	4-8	4	1-6

a Extrapolated from Australian Environment Council (1985). Percentages quoted are indicative only and are an arithmetic average of the values for Sydney, Melbourne, Brisbane, Perth and Adelaide. The values shown under the heading ‘range’ are the lowest and highest percentage for each gas from the five cities.

Source: Industry Commission (1994).

Although these figures are indicative only, they show that motor vehicles are the largest contributors of these atmospheric pollutants. However, as motor vehicles are responsible for most urban passenger transport, this is to be expected.

In response to community concerns, governments regulate the type and level of certain vehicle emissions. These emissions include:

- carbon monoxide
- oxides of nitrogen;
- hydrocarbons (the combustible element in fuel);
- particulate emissions such as diesel smoke; and

- heavy metals (mainly lead from petrol).

The overall intent of emissions regulation is to maintain or improve air quality. As a rule, FORS claims that emissions standards are designed to correspond with a ten year planning horizon, on the basis of forecasts of vehicle population and usage.

The carbon dioxide from vehicle emissions is also of concern as it is thought to have a role in global warming — widely known as the greenhouse effect. The Federal Government is preparing its National Greenhouse Response Strategy addressing Australia's international obligations .

New Vehicle Standards

The emissions requirements for all new PMVs in Australia are contained in ADRs. A summary of the relevant ADRs is contained in Table J.2. The Advisory Committee on Vehicle Emissions and Noise (ACVEN) develops the standards for vehicle emissions — both air and noise — which are in turn recommended to Government for implementation.

From 1 January 1997 a more stringent standard for new petrol engine emissions has taken effect — ADR 37/01. However, ADRs for vehicle emissions appear to lag behind other international standards. For example, Australian standards correspond with United States standards several years past. A review is presently developing alternative standards for petrol engines beyond 2000. While focusing on exhaust and evaporative emission standards this review will also look at broader issues, such as:

- including alternative fuels such as Liquefied Petroleum Gas (LPG) in the ADR system for spark ignition motors;
- the need to enhance vehicle pollution control systems to last beyond the current standard of 80 000 kilometres; and
- the arguments for and against on-board vehicle diagnostic systems.

Table J.2: **Summary of emission standards for new PMVs in Australia, 1972-1999**

Standard	*Date introduced*	*Exhaust emission limits*			*Drive cycle*	*Test method*	*Evaporative emission limits*
		HC	*CO*	*NOx*			*HC*
ADR26	1/1/1972	na	4.5% by volume	na	na	Idle	na
ADR27	1/1/1974	8.0-12.8 g/test[a]	100-220 g/test[a] and 4.5% by vol.	na	ECE-15 [195s]	ECE 'Big Bag' method and Idle [for CO%]	na
ADR27A	1/7/1976	2.1 g/km	24.2 g/km	1.9 g/km	Urban cycle [1372s]	US '72 Federal test procedure [CVS[d] method]	2g/test [carbon trap method]
ADR27B	1/1/1982	2.1 g/km	24.2 g/km	1.9 g/km	Urban cycle [1372s]	US '72 Federal test procedure [CVS[d] method]	6g/test [SHED[b] method]
ADR27C[c]	1/1/1983	2.1 g/km	24.2 g/km	1.9 g/km	Urban cycle [1372s]	US '72 Federal test procedure [CVS[d] method]	6g/test [SHED[b] method]
ADR37/00	1/2/1986	0.93 g/km	9.3 g/km	1.93 g/km	Urban cycle [1372s]	US '75 Federal test procedure [CVS[d] method]	2g/test [SHED[b] method]
ADR37/01	1/1/1997-1/1/1999[e]	0.26 g/km	2.1 g/km	0.63 g/km	Urban cycle [1372s]	US '75 Federal test procedure [CVS[d] method]	2g/test [SHED[b] method]

a emissions limit varies with vehicle weight.
b SHED refers to sealed housing for evaporative determination
c ADR27C introduced a number of administrative changes although the technical standards are unchanged.
d CVS refers to constant volume sampling.
e The 1997 commencement date applies to all vehicle models first produced on or after 1/1/1997, however all vehicles will have to comply by 1/1/1999.
na no limit applied at this time.

Source: Summary of FORS published data.

Until recently, emissions from diesel engines were only limited by the amount of visible smoke they produced. Between January 1995 and July 1996 a new standard ADR 70/00 has introduced limits on all significant noxious emissions from diesel engines. As is the case for spark ignition engines, ADR 70/00 is based on overseas standards and appears generally to lag overseas standards.[2]

A review has been initiated to develop an appropriate standard for diesel vehicles after 2000.

In-service vehicle standards

New vehicle standards have only a small initial impact on urban air quality because new vehicles take some time to impact on the overall performance of the fleet.

Victoria and New South Wales are presently the only Australian States that have in-service inspection of vehicles. In both cases the inspection involves an analysis for visible smoke for longer than ten seconds — the ten second smoke rule. Although Queensland and the Northern Territory have in-service emissions standards that are effectively the same as the ten second rule (sub. 165, p. 3). New South Wales is presently investigating the possibility of introducing in-service testing on a regular basis.

In a recent study, FORS (1996) analysed the extent and distribution of pollution from in-service vehicles and the potential for reducing emissions from this source. They found the major impact in terms of vehicle emissions came from vehicles 10 to 16 years old. FORS commented in their submission:

> The report found that the bulk of emissions come from cars within the age of 10 to 16 years.
>
> Cars in this group have fairly high average emissions, are still driven fairly intensively and are still very numerous because of the low turnover rate of the Australian fleet.
>
> Vehicles older than 16 years have less of an impact because they are fewer in number and travel less distance. (sub. 35).

But the main message from the report was the importance of vehicle maintenance, not merely the age of the vehicle stock. If all vehicles were well maintained, the report estimated that vehicle pollution would drop by 9 to 25 per cent. Furthermore these benefits could be achieved by simple maintenance

2 In line with the FORS goal of harmonisation with international standards ADR 70/00 allows manufacturers to certify to the European 1992 standard, with either the US 1991 or Japanese 1993 standards as alternatives. The European and US standards have since been amended. As all diesel engines are imported into Australia a unique Australian standard would be unworkable.

practices. In addition the report indicated that 80 per cent of these improvements could be achieved by identifying and fixing the worst 20 per cent of vehicles.

Substantial reductions in vehicle pollution could be achieved if all vehicles were well maintained. Reducing the average age at which vehicles were retired would reduce total exhaust emissions from the fleet. However, short of taking all vehicles over a certain age off the road, vehicle testing and in-service standards will be required to improve the emissions performance of the existing vehicle stock.

In-service vehicle testing and standards are the realm of State and Territory governments. While no national in-service standards currently exist, steps are being taken that might lead to a national in-service standard. At the Special Premiers Conference in October 1990, the Prime Minister, Premiers and Chief Ministers agreed to develop an Intergovernmental Agreement on the Environment (IGAE). This IGAE came into effect on 1 May 1992 and provides for a national body with responsibility for making National Environment Protection Measures (NEPMs). Complementary legislation establishing this body — the National Environment Protection Council (NEPC) — has been passed or is in the process of being passed in all Australian jurisdictions (NEPC 1996a, p. 1). The National Road Transport Commission described the purpose of the NEPC in its submission:

> The formation of NEPC is intended to result in a new, more coordinated and stronger approach to national environment protection standard setting. (sub. 191, p. 5)

In July 1996, the NEPC announced its intention to make a National Environment Protection Measure (NEPM) for ambient air quality under the provisions of the *National Environment Protection Council Act 1994*. This is the first attempt by the NEPC to establish a NEPM. The process is estimated to take until the end of 1997 and the resulting NEPM will become law once passed by a two thirds majority of the NEPC (NEPC 1996b, p. 1).

It is intended that the scope of the proposed NEPM covers the following six pollutants:

- carbon monoxide (CO);
- nitrogen dioxide (NO_2);
- photochemical oxidant (as ozone);
- sulphur dioxide (SO_2);
- lead (Pb); and
- particulate matter.

The draft NEPM will seek to establish monitoring and reporting protocols (NEPC 1996a, p. 1). Leaving out hydrocarbons, the list of chemicals to be included in the draft ambient air quality standards includes the vehicle pollutants of most concern. Furthermore, at the same time as a NEPM is being developed, the FORS, the New South Wales Environment Protection Authority and the New South Wales Roads and Traffic Authority are investigating the potential for the development of a cost-effective program for monitoring vehicle emissions in-service.

J.2.2 Vehicle fuel consumption targets

While vehicle emission levels are mandatory for new vehicles, the fuel consumption of the vehicle fleet is determined by a voluntary code of practice.

Since 1978 the Federal Chamber of Automotive Industries (FCAI), on behalf of its constituents, has reported the national average fuel consumption (NAFC) of new passenger vehicles to the Commonwealth Government under this code of practice. Table J.3 presents the performance of NAFC from 1978 to 1995.

In 1987 this formal arrangement lapsed. However, NAFC continued to be reported and the *Voluntary Code of Practice for Reducing the Fuel Consumption of New Passenger Cars* was concluded in April 1996. This voluntary code of practice is effective from 1/1/1996 to 1/7/2001 (FCAI 1996). It is intended to bring about a reduction in NAFC to 8.2 litres/100 kilometres by the year 2000. LCVs and 4WDs are not included in the code of practice.

The target proposed in the voluntary agreement results in an annual rate of increase in efficiency of about the same order as that expected in other developed countries (DPIE 1996). But, as noted earlier, Australian standards may initially be less stringent than international standards. NAFC reflects the vehicle fleet mix operating within a country. For example, the United States has about the same average fuel consumption as Australia whereas Europe with generally smaller vehicles has lower average consumption.

Table J.3: **National Average Fuel Consumption, Australia 1978 to 1995.**

Year	*National Average Fuel Consumption (NAFC)[a] Litres/100 kilometres*
1978	11.48
1979	10.90
1980	9.83
1981	9.73
1982	9.54
1983	9.25
1984	9.30
1985	9.25
1986	9.30
1987	9.40
1988	9.10
1989	9.16
1990	8.92
1991	8.82
1992	8.88
1993	8.93
1994	8.93
1995	8.76

a NAFC is total number of passenger vehicles marketed in Australia in a given calendar year by a certain FCAI member multiplied by the Corporate Average Fuel Consumption for that FCAI member, divided by the total number of new passenger vehicles marketed in Australia in that year as reported by FCAI VFACTS. NAFC is expressed in terms of litres per 100 kilometres travelled in accordance with standard AS2877.

Source: DPIE 1996.

As described above, the policy framework for reducing fuel consumption relies on a voluntary agreement, unlike the system for achieving vehicle emission targets which uses mandatory standards.

Despite adopting different frameworks for achieving their goals, both fuel emissions and consumption targets are generally aimed at achieving internationally recognised goals, albeit over different time horizons.

J.3 Vehicle safety

Just as there is much community concern about the environmental impact of the use of motor vehicles, there is great concern about vehicle safety.

The Commonwealth, State and Territory Governments have agreed that improved road safety is a desirable public policy goal. To this end they have systematically pursued enhanced levels of safety since about the 1970s. Recently Commonwealth, State and Territory Governments committed to a National Road Safety Strategy aimed at reducing the road toll significantly by the end of this century.[3] One part of this strategy involves improving the level of safety of the vehicles travelling Australia’s roads. The on-going commitment to improved safety was described by FORS as follows:

> Since the late 1980s Australia has undertaken a concerted effort to reduce the economic and social implications of road trauma. The number of deaths and serious injuries has

3 National Road Safety Action Plan, 1996.

> fallen by around 30 per cent since 1989. The annual economic savings have been in the vicinity of $2 billion. (sub. 35, p. 2)

J.3.1 The present regulatory framework for safety

The major legislative and regulatory arrangements in place in the automotive industry apply to vehicle safety as well as environmental impacts. That is, the enabling legislation is the *Motor Vehicle Standards Act 1989* (Cth), and technical requirements for vehicle safety are specified as ADRs.

Australia's capacity to improve safety requires the effective implementation of a broad array of strategies, action plans and objectives by all levels of public administration across the nation. These means of enhancing safety fall into two general classes; active measures and passive measures. As FORS described:

> The levels of safety may either be active, to minimise the chances of vehicles being involved in crashes, or passive which minimise the amount of injury caused to those involved in a crash. (FORS, sub. 35, p. 2)

The present regulatory environment influences the level of both active and passive safety measures. It is discussed below in more detail.

Impact of ADRs on vehicles

Since 1970 Australia has operated a whole vehicle type approval system (FORS 1996). The safety requirements for new vehicles in Australia are specified in ADRs.

In 1984 a review was undertaken to address the Commonwealth Government's policy to harmonise Australian and International standards and to facilitate registration of vehicles without the need for further inspection by State and Territory authorities. This review led to more than 60 per cent of Australian safety standards for PMVs being aligned to United Nations Economic Commission for Europe (UNECE) regulations (FORS, sub. 35).

Test Facility Inspections (TFIs) to assess test result acceptability for ADR compliance and Conformity of Production (COP) to assess manufacturers quality assurance systems were also adopted to ensure that manufacturers were building PMVs that complied with ADRs. In addition, a Single Uniform Type Inspection Scheme was initiated whereby a vehicle of the type for which approval is sought is inspected to ensure compliance with ADRs prior to that model being released to the market.

In Korea, the United States, Canada and Australia, these audits are conducted by FORS officers. In Japan, the United Kingdom, Sweden, Germany, France and Italy these audits — TFIs and COPs — are conducted on behalf of FORS by qualified agents. Manufacturers of vehicles supplied from other countries are audited by FORS officers. Test facilities used for testing to acceptable UNECE regulations and laboratories registered by the National Association of Testing Authorities are generally exempt from further audit.

There are presently about 70 ADRs that relate to safety for all vehicle categories. These ADRs are developed in accordance with Council of Australian Governments' (COAG) guidelines. This requires broad consultation under the realm of the National Road Transport Commission and the circulation of draft ADRs for comment. In addition, regulatory impact statements which assess cost effectiveness are prepared for some proposed changes.

FORS is currently embarking on a review of all ADRs as part of the Trans Tasman Mutual Recognition Arrangement and in 1997 the *Motor Vehicle Standards Act 1989* (Cth) is due to be reviewed under the Commonwealth Government's regulatory efficiency program.

Currently there are about 150 separate vehicle models approved for the Australian market under the provisions of the *Motor Vehicle Standards Act 1989* (Cth). Of these, 21 are 4WDs (FORS, sub. 35).

The movement to functional equivalence and mutual recognition of standards is favourable to both Australian vehicle manufacturers and to importers. A global standard allows importers to have greater access to the Australian market for their products and it also offers Australian producers the opportunity to export their vehicles and gain the benefits of a larger market.

The principal legislation also applies to imported second hand vehicles. At present there are low volumes of second hand vehicles and the arrangements are the same as for new vehicles — the specifications for one vehicle must be representative of the general class of vehicles and they must comply with ADRs.

However, the theoretical transferability of the new vehicle framework is limited. As second hand vehicles are a heterogeneous good, unlike new vehicles, it is reasonable to assume that their quality will vary. It is possible, as a consequence of this variability, that the performance of those vehicles with respect to safety standards will also vary. It may be the case that a large market in imported second hand vehicles would require a different framework for safety regulation.

Impact of ADRs on the component sector

ADRs also have a significant impact on the automotive component sector. As State and Territory legislation requires owners to maintain their vehicles in the same condition as when they first entered the market, replacement parts are therefore required to meet the same standards. Certain components have their own ADR, for example safety glazing material (glass).[4] In other cases the ADR applies to an assembly of components, for example steering columns.[5]

The provisions of the *Trade Practices Act 1974* (Commonwealth) also serve to limit the sale and usage of unsafe components. In particular, Part V deals with consumer protection and Part V(A) deals with the liability of manufacturers and importers for defective goods. Although the provisions of the *Trade Practices Act 1974* (Commonwealth) are not interchangeable with ADRs, compliance with ADRs is a guide to product safety. In combination with ADRs the legislation provides strong incentives for component producers to maintain the highest standards.

J.3.2 Harmonisation of standards and homologation of testing frameworks

Australia has a policy of harmonising wherever possible with UNECE Regulations. As noted earlier, currently over sixty per cent of the ADRs are harmonised with these standards.

ADRs are currently under review to meet the requirements of the Trans-Tasman Mutual Recognition Arrangement. A five year Cooperation Program has been provided for the development of a common set of vehicle standards for Australia and New Zealand. The harmonised Australian/New Zealand vehicle standards system will be based on the UNECE Regulations.

Australia is committed to a number of Treaties, Agreements, Arrangements and other commitments that affect standards. Examples of these include the World Trade Organisation Agreement on Technical Barriers to Trade, APEC's Bogor Declaration, the European Union Mutual Recognition Agreement on Conformity Assessment and the Trans-Tasman Mutual Recognition Arrangement.

The UNECE is the only forum for vehicle safety regulations that meets the World Trade Organisation Agreement on Technical Barriers to Trade definition of an international standardising body. Significantly, Australia is working with its counterparts in other countries to promote the UNECE as the appropriate international standards setting body for the global automotive industry.

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4 ADR number 8. This aligns totally with ECE regulation for PMVs number 43.

5 ADR number 10. This aligns totally with ECE regulation for PMVs number 12.

At the APEC Economic Leader's meeting in Indonesia in November 1994, APEC economies made commitments to free and open trade and investment in the APEC region by 2010 for developed economies and 2020 for developing economies (see Chapter 7 and Appendix H). APEC working groups are involved in discussions to ensure that technical barriers to trade in the region are removed and the necessary technical infrastructure is established to provide confidence that product meets agreed requirements.

Australia has developed a draft 'model' Mutual Recognition Agreement covering automotive product intended for use by APEC member economies to allow acceptance of product complying with functionally equivalent standards. The use of the 'model' Mutual Recognition Agreement by APEC members is intended as an interim measure prior to acceptance of international standards.

The Trans-Tasman Mutual Recognition Arrangement represents a natural extension of the Australia New Zealand Closer Economic Relations Trade Agreement which fosters the integration of the trans-Tasman economies.

At the COAG meeting in June 1996, all Australian Heads of Government signed the Trans-Tasman Mutual Recognition Arrangement. The New Zealand Prime Minister added his signature to the Trans-Tasman Mutual Recognition Arrangement in July 1996.

The Special Exemption provisions of the Trans-Tasman Mutual Recognition Arrangement allow a five year period to develop a harmonised set of standards for automotive product and a common certification system. It was agreed that the common pool of vehicle safety and emission standards are based on the UNECE regulations together with a harmonised Australia/New Zealand certification process.

The proposed revision to the Australian regulatory arrangements for the Trans-Tasman Mutual Recognition Arrangement support Australia's international obligations to adopt internationally harmonised standards.

Australia recently completed negotiations on a Mutual Recognition Agreement on Conformity Assessment with the European Union. FORS has responsibility for ensuring the Automotive Annex to the Agreement properly protects Australia's interests whilst providing export opportunities to the European Union for Australia's vehicle and component industries.

Australia and Japan have agreed to commence discussions on a mutual recognition agreement on conformity assessment. FORS supports the establishment of an effective mutual recognition agreement on automotive product with Japan.

Discussions have been held between the Department of Transport and Regional Development and the Indonesian Ministry of Communications over recent years to foster a closer relationship between the transport portfolios. Discussions are also being held on a number of relevant issues including vehicle training, standards and conformance. BPIS (Indonesian Agency for Strategic Industries) who are developing the national car, codename ‘Maleo’, have expressed an interest in the adoption, by Indonesia, of the Australian Design Rules.

J.3.3 In-use standards

As noted earlier, in-service vehicle standards such as roadworthiness are the responsibility of State and Territory governments. The National Road Transport Council has developed draft in-service standards intended for national introduction to compliment the ADRs. The Ministerial Council on Road Transport (a Commonwealth/State body) will consider these proposals in 1997 for uniform adoption by the States and Territories.

The current in-service vehicle inspection regimes for PMVs are not consistent across Australia. Yet there are relatively few in-service standards that vary and those that vary typically apply to old vehicles — where the dates of adoption differed across States. There are also variations in the treatment of modified vehicles, but this concerns relatively few vehicles (sub. 165).

Present approaches to in-service vehicle inspection include:

- NT — annual roadworthiness inspection, government run;
- ACT — random tests, often in carparks. More complete inspections can be ordered.
- NSW — annual roadworthiness test with renewal of registration, privately run;
- TAS — some random spot checks and roadworthiness inspections for vehicles transferred from another jurisdiction;
- VIC — at transfer of ownership and re-registration of second hand vehicles; and
- SA and WA — effectively nothing.

In States without formal testing programs, on-road inspections are carried out by police officers and other agencies.

K HISTORY OF ASSISTANCE

K.1 Overview

The Australian automotive manufacturing industry (automotive industry) has received government assistance since its commencement in the early 1900s.[1] Assistance to the industry has had a dominant influence on its development since the introduction of the first Motor Vehicle Manufacturing Plan in 1965. After 1965 the complexity and level of assistance to the automotive industry increased considerably until the introduction of the Button Car Plan in 1985. After 1985 the complexity and level of assistance to the industry declined dramatically. By comparison, the level of assistance to the manufacturing sector has been declining since the mid 1960s and is still well below the level of assistance to the automotive industry. (See Figure K.1 and Attachment K1).

K.2 Comparable levels of assistance — 1900 to 1965

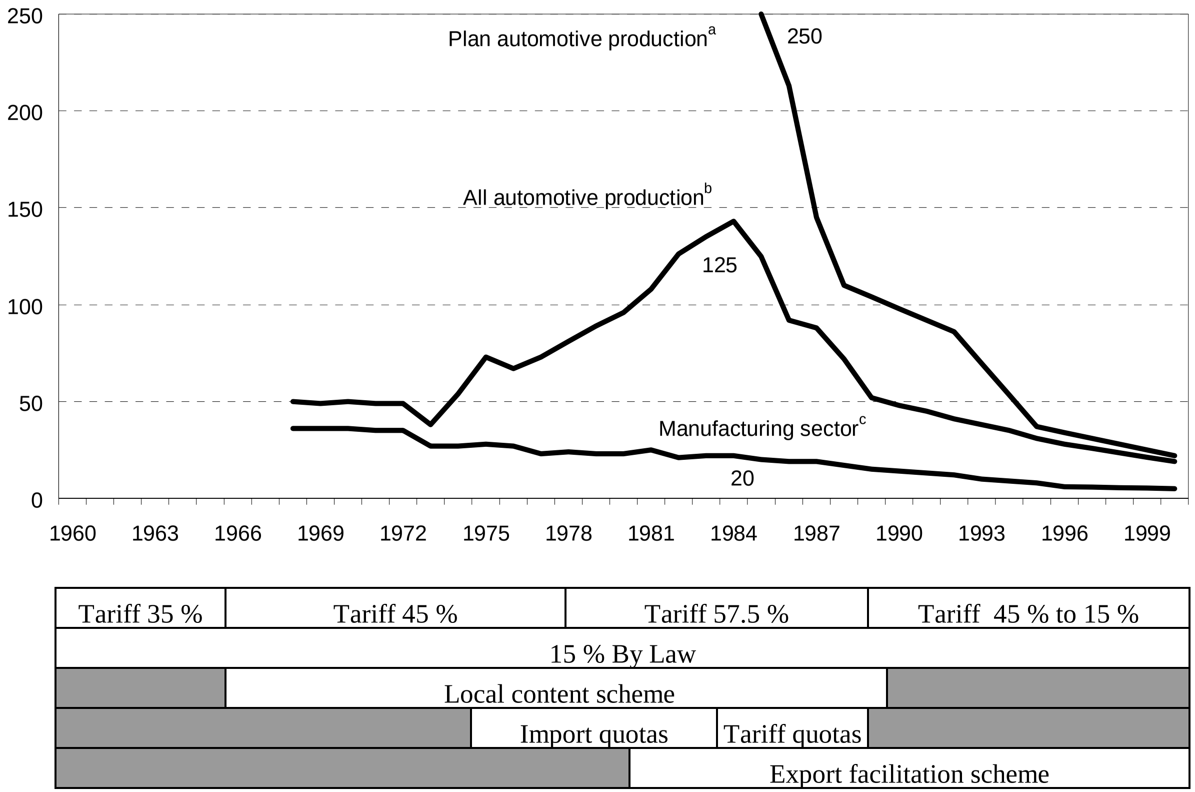
Special assistance to the automotive industry dates back to 1907 when the Commonwealth Government introduced tariffs to assist the manufacture of vehicle bodies and components. After the First World War the Government increased tariffs on vehicle bodies and components and in 1925 the assembly of passenger motor vehicles (PMVs) commenced in Australia.

During the 1930s the Government expressed a desire to promote the complete manufacture of PMVs in Australia and provided further assistance as an incentive. In 1948 Holden produced the first Australian PMV.

During the 1950s the Government continued its commitment to the complete manufacture of PMVs in Australia. Assistance provided included both tariff and non-tariff incentives such as concessional loans, local content arrangements and import licences. By 1960 the Australian automotive industry consisted of nearly 300 companies employing over 30 000 people.

1 The ‘Australian automotive manufacturing industry’ refers to the production of passenger motor vehicles (PMV) and the production of components for PMVs.

Figure K.1: **Assistance arrangements and effective rates of assistance, 1960 to 2000** (per cent)



a Plan automotive production refers to the production of PMVs and components for PMVs. Estimates of effective rates of assistance for plan automotive production are only estimated for 1985 to 1992 and for 1995 and 2000.
b All automotive production refers to the production of all motor vehicles and parts including plan automotive production. Estimates for effective rates of assistance for all automotive production are not estimated for 1960–61 to 1966–67.
c Estimates for effective rates of assistance for the manufacturing are not estimated for 1960–61 to 1966–67.
Source: IC (1990a), IC (1995e) and Commission estimates.

K.3 High levels of assistance — 1965 to 1985

The level and complexity of assistance to the automotive industry increased significantly between 1965 and 1985 (see Figure K.1).[2] Assistance to the manufacturing sector, however, declined over this period, creating a large disparity between the level of assistance to the automotive industry and other manufacturing industries (see Figure K.1).[3]

The automotive industry continued to expand over this period, becoming highly fragmented and insular. By 1985 the industry was producing over 380 000 vehicles a year, employing 60 000 people and making 13 models of PMV.

Throughout the 1960s and early 1970s the major aim of Government automotive industry policy was to increase the level of local content in vehicles assembled or produced in Australia. The Government's stated policy was to:

> ... maintain a viable industry producing at high levels of local content and ensuring consumers access to reliable, economical and reasonably priced vehicles. (House of Representatives 1976, p. 1130)

In 1965, the Government introduced the first of a series of Motor Vehicle Manufacturing Plans to promote higher levels of local content. Local content provisions under the plan provided vehicle producers with tariff concessions on imported components if the vehicles they produced consisted of at least 95 per cent local content. The first plan included separate local content provisions for small volume producers which varied according to production volume, the specified level of local content and the tariff concessions provided.

The competitive position of the industry steadily declined in the late 1960s. The Government responded by increasing the tariff rate of PMVs from 35 per cent to 45 per cent in 1966.

By the mid 1970s the Government recognised that there was a potential conflict between its policy objectives:

> High costs of production in Australia, resulting mainly from the smallness of the domestic market and the short productions runs, means that the higher the level of Australian content in vehicles the less competitive they become against imports and to the extent that higher protection is provided the greater is the price to consumers. (House of Representatives 1976, pp. 1128–29)

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2 The effective rate of assistance (ERA) for all automotive production was 50 per cent in 1968–69 compared to a 143 per cent in 1984–85 (see Table K.3). The ERA for plan automotive production was significantly higher than for all automotive production, estimated to be over 250 per cent in 1985 (see Table K.2).

3 The ERA for the manufacturing sector was 36 per cent in 1968–69 compared to 22 per cent in 1984–85 (see Table K.3).

The Government recognised the need for structural change to improve the industry's efficiency and competitiveness. It stated that:

> ... if a viable motor vehicle industry is to continue in Australia considerable changes will be needed in the industry's structure and the nature of manufacturing operations in Australia. (House of Representatives 1976, p. 1130)

However, assistance to the industry continued to increase as its competitiveness declined, in an effort to avoid disruption and unemployment in the industry.

In 1975, under a new plan, the Government rationalised local content provisions by introducing a single local content scheme with a specified level of 85 per cent, to replace the 95 per cent local scheme. Small volume provisions, which discouraged large scale production, were phased out because they had led to model proliferation in the vehicle sector and fragmentation in the component sector.

The Government also introduced import restrictions under the new plan. The 80/20 market sharing policy restricted imports to 20 per cent of the local market through the use of import quotas. Although initially intended to be a short term stabilisation mechanism, import quotas became a central part of automotive industry policy and were extended until the end of 1984.

In 1978, as the industry's competitiveness declined further, the Government increased the tariff rate of PMVs imported under quota to 57.5 per cent. However the quota on imported vehicles was the main form of protection.

In 1979, the Government announced its decision to introduce export facilitation measures into the plan, in response to a proposal by General Motors-Holden. Export facilitation was the first policy measure designed to encourage the Australian industry to integrate into the global automotive industry, rather than being protected from it. The Government stated that:

> ... given the small domestic market for motor vehicles in Australia, the only real and effective way that the industry can improve its cost structure is through closer integration with the world industry and ... the export opportunities [the EFS] will provide. (House of Representatives 1979, p. 316)

Under the export facilitation scheme vehicle and component producers could earn credits for their exports and vehicle producers could use these credits to offset to some extent, their duty on imports. The incentive to export more was being provided through import duty concessions. This encouraged the industry to specialise in what it produced most efficiently and to import components that Australia was particularly inefficient at producing. It enabled vehicle producers to use export credits to source components from overseas that were particularly costly to produce in Australia, and to reduce their local content below the prescribed 85 per cent level (See Appendix L).

K.4 Declining levels of assistance — 1985 to 2000

In 1985 the level of assistance to the automotive industry peaked as the level of assistance to the manufacturing sector continued to decline. The industry had become one of Australia's most highly assisted industries, supported by a complex package of assistance measures which automatically increased assistance when the industry's competitiveness declined. The PMV sector was assisted by tariffs, quotas, duty concessions and export facilitation and the component sector was assisted by an 85 per cent local content scheme.

Since 1985 the Government has been 'winding back' assistance to the automotive industry, encouraging it to adjust to progressively lower levels of assistance.[4] In 1984 import quotas were replaced with tariff quotas and in 1988 tariff quotas were abolished and tariff reductions commenced. Current assistance arrangements, consisting of tariffs and export facilitation, no longer offer 'open ended' assistance to the industry.

Over the last ten years the industry's production volumes have contracted, largely in response to increased competition stimulated by declining levels of assistance. In 1996 the industry consisted of four vehicle producers and 38 major component producers employing just under 50 000 people and making 5 models of PMV (see Chapter 2).

K.4.1 Encouraging adjustment

The Government introduced the Button Car Plan in 1985, following a report by the Industry Assistance Commission on assistance arrangements to the automotive industry after 1984, and a report from the Car Industry Council.[5] When announcing the plan in May 1984, the Government expressed concern

[4] The ERA for plan automotive production fell from 250 per cent in 1985 to 37 per cent in 1995 (see Tables K.2 and K.3). The ERA for the manufacturing sector fell from 22 per cent in 1984–85 to 12 per cent in 1992–93.

[5] In October 1983 the Government appointed a Car Industry Council comprising representatives from the automotive industry. The Council was set up to consider and report on requests made to Government in relation to changes to automotive policy; and on what joint action could be taken by the industry and the Government in relation to automotive industry policy (Car Industry Council 1983).

about the adverse effects of previous plans on the industry:

> Government policy since the mid 1960s has been increasingly characterised by short term crisis containment, lack of direction and inward looking policies. In summary, the result has been an industry which has had rising levels of protection and declining levels of performance — circumstances which are costly to the taxpayer and damaging to the industry itself in terms of morale, prestige, security of the workforce and capacity to plan ahead. (Button 1984, p. 2)

The Government clearly recognised the weakness of the industry but considered that given the ‘right policy environment and commitment from industry’ it could become a strength in the Australian economy (Button 1984, p. 1). The stated objectives of the new plan were to:

> - give the industry more time to restructure and modernise;
> - to make it more efficient;
> - to hold down the price of cars; and
> - to reduce job losses in the short term and provide job stability. (Button 1984, p. 1)

In pursuit of these objectives, a variety of measures were implemented:

- the 20 per cent quota on vehicle imports was replaced by tariff quotas set to phase out by 1992;
- the local content scheme was retained with only minor amendments;
- access to the export facilitation scheme was increased;
- labour adjustment training arrangements were put in place; and
- the Automotive Industry Authority was established to oversee the new arrangements.

Central to the assistance package was the view that the industry should be gradually exposed to international competition and treated more like other Australian industries, and that greater realisation of economies of scale would improve industry efficiency. The Government expressed a desire to see an industry structure by 1992 of no more than three manufacturing entities producing six models at most.

Subsequent to the introduction of the plan, some changes to arrangements were made, although these did not change the basic policy framework and direction of the plan. In December 1986, penalties for low volume production were introduced and in January 1987, separate export facilitation provisions were introduced for vehicle importers.

The Government further reduced assistance to the industry following a mid-term review of the plan in April 1988.[6] These mid-term changes were precipitated by the substantial depreciation of the Australian dollar in 1985 and 1986, which had significantly reduced the adjustment pressure on the industry and had substantially undermined the general intention of the Button Plan.

Tariffs on PMVs were reduced from 57.5 per cent to 45 per cent immediately, phasing down to 35 per cent by 1992. Tariffs on light commercial vehicles (LCV) and four wheel drives (4WD) were reduced immediately to 20 per cent (from 35 per cent and 25 per cent respectively) phasing down to 15 per cent by 1992. The local content scheme was to be abolished in January 1989 and replaced by a dual tariff arrangement which aligned tariff rates on original equipment (OE) components with the tariff rate on PMVs.

In contrast to previous assistance packages, the basic framework and direction of the plan was adhered to from 1985 to 1992, creating a more stable environment for industry investment.

K.4.2 Maintaining adjustment pressure

In May 1990 the Government asked the Industry Commission to report on assistance arrangements for the automotive industry from 1993 to 2000. That report was delivered to Government in December 1990. In its *March 1991 Industry Policy Statement* the Government announced new assistance arrangements for the automotive industry, taking up most of the recommendations made by the Industry Commission in its 1990 Report. The new plan continued in the same policy direction as the previous plan. As stated in the *March 1991 Industry Policy Statement*:

> The Government’s prime objective remains the development of an Australian automotive industry that is viable and internationally competitive, providing higher quality vehicles at lower real prices to consumers.
>
> This process is already underway. The 1984 Car Plan laid the groundwork for achievement of this objective. It has encouraged rationalisation in the industry, raised quality and boosted exports. (Hawke 1991, p. 5.5)

Under the new arrangements, tariff phasing continued, with tariffs declining to 15 per cent by 2000, and export facilitation provisions were ‘expanded and made more flexible’ (see Appendix L). In addition, the Government announced

6 Reductions in assistance to the automotive industry occurred around the same time as the Government introduced a general program of phased tariff reductions for most other manufacturing industries (see *May 1988 Economic Statement*). Under the program general tariffs were scheduled to fall to between 10 per cent and 15 per cent by 1992.

that penalties for low volume production would be abolished and an improved labour adjustment package was offered.

These arrangements continued the direction of public policy set in 1985 under which assistance to the automotive industry would gradually be reduced so that it became similar to assistance provided to all other industries in Australia.

In July 1991, the Government introduced a specific tariff of $12 000 on imported second hand vehicles, in addition to the *ad valorem* tariff on new vehicles. The specific tariff was introduced in response to industry concerns that high volume importation of second hand vehicles from Japan could have a significant adverse effect on the local industry, at a time when it was already under considerable pressure from the tariff reductions announced in March 1991.

ATTACHMENT K1 A DETAILED HISTORY OF ASSISTANCE

Table K1.1: **Assistance to the automotive industry, 1960 to 2000**

1960 The Government abolished import licence controls.

1964 The Government announced the first Motor Vehicle Manufacturing Plan (plan) in May 1964.

1965 The first plan became effective in January 1965 and consisted of three levels which linked the required amount of local content in Australian produced vehicles to the size of the models production volumes. Once the required volume was met, the remaining content received duty free entry under by-law. Level A required 95 per cent local content. Level B1 and B2 were interim arrangements, pending the Government's decision on the Tariff Board's 1965 report, which required lower levels of local content for models with smaller production volumes.[a]

The plan was accompanied by the Car Component Manufacturing Programs. Under these programs certain components which met a minimum specified local content (usually 85 per cent) were deemed to have 100 per cent local content when used by a vehicle producer under the plan.

1966 Following the Government's consideration the Tariff Board's 1965 report level B1 and B2 were replaced by three small volume provisions; 45 per cent for volumes not exceeding 2500, 50 per cent for volumes not exceeding 5000 and 60 per cent for volumes not exceeding 7500.

The tariff rate on PMVs was increased from 35 per cent to 45 per cent.

1968 The Government introduced a local content level of 85 per cent for vehicles with production volumes below 25 000.

1971 The Government announced that the 45 per cent, 50 per cent and 60 per cent local content levels would be phased out by the end of 1974 and that the 85 per cent and 95 per cent local content levels would continue until 1979.

1973 The Government sent a reference to the Tariff Board to report on assistance to the industry.

The Government announced a 25 per cent tariff reduction across the board reducing the tariff rate on PMVs from 45 per cent to 33.75 per cent, the tariff rate on LCVs and 4WDs from 35 per cent to 26 per cent.

1974 In its 1974 report the Industries Assistance Commission (IAC) (formerly the Tariff Board) recommended that the automotive industry be assisted by a tariff-only regime which should be set at 25 per cent in the long term.[b]

The Government introduced a trigger tariff mechanism which increased from 35 per cent to 45 per cent for completely built up (CBU) vehicles when the import share of the PMV market exceeded 20 per cent.[c]

... continued

Table K1.1: **Assistance to the automotive industry, 1960 to 2000** (continued)

1975	After consideration of the IAC's 1974 report, the Government introduced a new plan which replaced the three small volume provisions and the 85 per cent and 95 per cent local content levels. The new plan, scheduled to run until the end of 1984, required that 85 per cent local content be achieved on a company weighted average basis.
	The Government also introduced the 80/20 market sharing policy (using import quotas), restricting the import share of the PMV market to 20 per cent.[d] PMV derivatives and LCVs were also subject to import quotas from February 1975 to March 1976.
	The tariff rate on many components was standardised at 25 per cent and tariff quotas were imposed on completely knocked down (CKD) vehicle packs.
1976	The Government introduced a revised plan in September 1976 after consideration of the IAC's 1975 report.[e] The revision allowed participants in the plan to phase into the 85 per cent local content level. Import quotas on CBU PMVs, LCVs and CKD vehicle packs were removed.
	The tariff rate on LCVs was increased to 35 per cent and the tariff rate on 4WDs was reduced to 25 per cent.
	The tariff rate on CKD vehicle packs was to be phased up to 35 per cent by December 1976 and tariff quotas on CKD vehicle packs were removed.
1977	The Government re-imposed import quotas on CBU PMVs.
1978	The tariff rate on 4WDs was reduced to 22.5 per cent and the tariff rate on PMVs was increased to 57.5 per cent.
	The Car Component Manufacturing Programs which accompanied earlier local content plans were phased out by 1978.
1979	The Government announced the introduction of export facilitation measures for vehicle producers into the plan in February 1979, and sent references to the IAC to report on the details of an Export Facilitation Scheme (EFS) and to report on assistance measures post 1984.
1981	The Government announced that the EFS would be extended to include component producers under specialist component producer provisions.
	The IAC released its report on post 1984 assistance arrangements for the automotive industry and the Government announced a new plan for the automotive industry.[f]
1982	Export facilitation measures became effective in March 1982. Export facilitation measures allowed vehicle producers to reduce the level of local content in their vehicles below 85 per cent, conditional on their export performance.

... continued

Table K1.1: **Assistance to the automotive industry, 1960 to 2000** (continued)

1983	The Government sent a reference to the IAC to report on substitution between PMVs and LCVs. The IAC released its report in December 1983.[g]
	An industry sponsored and administered Component Commonisation Scheme commenced, which aimed to standardise component specifications. The Government established the Car Industry Council to provide advice on post 1984 assistance arrangements. The council reported in December 1983.
1984	The Government announced a new plan in May 1984, scheduled to run until 1992.
1985	The new plan (commonly referred to as the Button Car Plan) became effective in January 1985.[h]
	Tariff quotas were introduced to replace import quotas and set at around 22 per cent of the expect PMV market each year with a penalty duty of a 100 per cent for out-of-quota imports. The intention was to phase the penalty duty down to 57.5 per cent by 1992, equal to the general tariff for imports inside the quota, rendering tariff quotas redundant.
	The 85 per cent local content scheme was retained. Under the local content scheme vehicle producers were able to import duty free vehicles and/or components worth up to 15 per cent of the value of their production, if they sourced locally, at least 85 per cent of the value of the vehicles they produced. Imports in excess of the 15 per cent were penalised by a progressively higher duty the longer a vehicle producers failed to comply with the scheme.
	The export facilitation scheme was broadened. Restrictions limiting the use of export credits to the importation of components were removed to allow the importation of CBU vehicles, the definition of eligible exports was amended to allow substantially similar good to qualify, and vehicle producers were allowed to participate in the special component producers' export facilitation provisions.
	Labour Adjustment Training Arrangements (LATA) were put in place. Vehicle producers and component producers are to be designated for the purposes of the LATA, which provided re-training assistance to retrenched workers.
	The Component Development Grants Scheme was established and allocated $150 million.
	The Automotive Industry Authority (AIA) was established and allocated $150 million over five years to report annually on the industry's performance and outlook and to perform certain advisory and administrative functions in relation to the plan.
1986	The Government introduced penalties for low volume production. To receive the full 15 per cent duty free entitlement under the local content scheme, vehicle producers had to reach production volumes of at least 30 000 units per year, per model.
1987	The export facilitation scheme was extended to include vehicle importers and the upper limit of the scheme was increased to 15 per cent.

... continued

Table K1.1: **Assistance to the automotive industry, 1960 to 2000** (continued)

1988	Following a mid-term review of the 1984 plan, import quotas were abolished in April 1988 and the tariff rate on PMVs was reduced to 45 per cent and scheduled to fall 2.5 per cent per year until 1992. Tariff rates on LCVs and 4WDs were reduced to 20 per cent. The limits on vehicle producers and component manufacturers to earn on export credits under the export facilitation scheme were increased, and the vehicle importers scheme was extended for two years beyond 1992 (as originally scheduled). It was announced that the local content scheme would be abolished in January 1989.
1989	The local content scheme was abolished in January 1989 and replaced with a dual tariff arrangement which aligned tariff rates on OE components to the tariff rate on PMVs.
	The Component Commonisation Program, an industry self help programme supported by the Government, ceased.
1990	The Government sent a reference to the Industry Commission (IC) (formerly the IAC) to report on assistance arrangements to the industry from 1993 to 2000.
1991	Following the release of the IC's 1990 report, the Government announced new assistance arrangements for the industry to 2000.[i] Scheduled tariff rate reductions and access to the 15 per cent duty-free entitlement were continued. Penalties for low volume production were continued but set to expire in December 1996 and LATA was replaced by the Labour Adjustment Package.
	Export facilitation arrangements were expanded and made more flexible and market oriented. Export value base year hurdles were abolished, export credits were to be earned on value added in local content in stead of full local content value, upper limits on earning export credits were abolished, restrictions on the sale and transfer of export credits were abolished and the definitions of eligible imports and exports were broadened.
1992	Tariff rates on LCVs and 4WDs were reduced to 15 per cent and set to fall to 5 per cent by 1996. Tariff rates on replacement components for PMVs and derivative PMVs were maintained at 15 per cent from 1992 to 2000.
	The Government introduced a specific tariff of $12 000 per vehicles, in addition to the *ad valorem* tariffs on new vehicles, for high volume importation of second hand vehicles.
1994	The AIA was abolished in July 1994 and its functions taken over by the Department of Industry Science and Tourism (DIST).
1996	The Government sent a reference to the IC to report on the assistance arrangements for the industry from 2000.
	Penalties for low volume production were discontinued.
	The tariff rate on LCVs and 4WDs was reduced to 5 per cent where it is scheduled to remain until 2000.

a See Tariff Board (1965).

b See IAC (1974).

c In practice the trigger tariff became operative in November 1974 although it was not incorporated in the tariff unit January 1975. The lower bound of the trigger tariff was never operative and it was abolished in October 1979.

d Although the market sharing policy was intended to be a temporary measure at the time it became an ongoing part of the Government's assistance package until 1984.

e See IAC (1975).

f See IAC (1981). The Fraser Government's new plan was superseded by the Hawke Government's Button Car Plan.

g See IAC (1983).

h See Button (1984).

i See IC (1990b).

Sources: IC (1990b), IAC (1981), DIST (1995b), BIE (1996a) and Button (1984).

Table K1.2: **Tariff rates and estimated rates of assistance for plan automotive production, 1960 to 2000** (per cent)[a]

	Passenger motor vehicles			*Original equipment components*		
	Tariff rate	*Effective rate of assistance*[b]	*Nominal rate of assistance*[c]	*Tariff rate*	*Effective rate of assistance*[b]	*Nominal rate of assistance*[c]
1960-65	35	na	na	na	na	na
1966-72	45	na	na	na	na	na
1973	33.75	na	na	na	na	na
1974	45	na	na	na	na	na
1975	45	na	na	25 [d]	na	na
1976	45	na	na	na	na	na
1977	45	na	na	na	na	na
1978	57.5	na	na	na	na	na
1979	57.5	na	na	na	na	na
1980	57.5	na	70–85 [e]	35 [f]	na	40–90 [g]
1981	57.5	na	na	na	na	na
1982	57.5	na	na	na	na	na
1983	57.5	na	na	na	na	na
1984	57.5	na	na	na	na	na
1985	57.5	>250	85	100 [h]	162	67
1986	57.5	>250	69	95 [h]	35	22
1987	57.5	>250	49	90 [h]	27	20
1988	45	233	38 [i]	45 [j]	48	26
1989	42.5	137	36	42.5	85	38 [k]
1990	40	127	34	40	81	36
1991	37.5	117	32	37.5	76	34
1992	35	108	30	35	71	32
1993	32.5	na	28	32.5	na	29
1994	30	na	26	30	na	27
1995	27.5	31 [l]	23	27.5	53 [l]	25
1996	25	na	21	25	na	23
1997	22.5	na	19	22.5	na	20
1998	20	na	17	20	na	18
1999	17.5	na	15	17.5	na	16
2000	15	19 [l]	13	15	31 [l]	14

na Not available.

a Plan automotive production refers to the production of PMVs and components for PMVs.

b The effective rate of assistance is defined as the percentage change in returns per unit of output to an activity's value adding factors due to the assistance structure (see IC 1990a).

c The nominal rate of assistance is defined as the percentage change in gross returns per unit of output due to the assistance structure (see IC 1990a).

d In January 1975 the tariff rates on many components were standardised at 25 per cent, although there was still variability in tariff rates for some components.

e This range is a Commission estimate of *ad valorem* protective incidence on imported vehicles accorded under the plan. The estimate is based on the tender premium paid for the right to import vehicles plus the tariff on vehicles (IAC 1981).

f The tariff rate on clutches and gear boxes has been used as an example although there was still variability in tariff rates for some components.

g	This range is a Commission estimate of the average nominal assistance to local component production accorded under the Plan. The estimate was implied from average levels of price disadvantage; that is, the average extent to which local component prices exceeded the landed duty free price of imported equivalents (IAC 1981).
h	The tariff rate on clutches and gear boxes has been used as an example although there was still variability in tariff rates for some components.
i	In April 1988 import quotas were abolished and the vehicle sector operated under a tariff-only arrangement. The nominal rate of assistance to vehicles from 1989 onwards is equal to the tariff adjusted for the difference between free-on-board (FOB) import prices and landed-duty-free (LDF) import prices (IC 1990a). A FOB/LDF ratio of 0.85 was used to deflate the tariff rate.
j	In April 1988, the tariff rates on all OE components were reduced to 45 per cent in line with the tariff rate on PMVs.
k	In January 1989 the local content scheme was abolished and the component sector operated under a dual tariff arrangement with the vehicle sector. The nominal rate of assistance to components from 1989 onwards is equal to the tariff rate adjusted for the difference between FOB import prices and LDF import prices (IC 1990a). A FOB/LDF ratio of 0.9 was used to deflate the tariff rate.
l	Commission estimates.
Sources:	Australian Customs Service, IC (1990a), IC (1990b), IAC (1981) and Commission estimates.

Table K1.3: **Effective and nominal rates of assistance for motor vehicle and part industries, 1968–69 to 2000–01** (per cent)[a]

	Effective rate of assistance[b]		*Nominal rate of assistance*[c]	
	All manufacturing	*Automotive Industry*	*All manufacturing*	*Automotive Industry*
1968–69	36	50	24	35
1969–70	36	49	23	35
1970–71	36	50	23	35
1971–72	35	49	22	34
1972–73	35	49	22	34
1973–74	27	38	17	26
1974–75	27	54	15	29
1975–76	28	73	16	34
1976–77	27	67	15	32
1977–78	23	73	15	38
1978–79	24	81	15	42
1979–80	23	89	15	46
1980–81	23	96	15	50
1981–82	25	108	16	53
1982–83	21	126	13	50
1983–84	22	135	13	51
1984–85	22	143	13	49
1985–86	20	125	12	40
1986–87	19	92	12	28
1987–88	19	88	11	27
1988–89	17	72	10	26
1989–90	15	52	9	28
1990–91	14	48	8	26
1991–92	13	45	8	24
1992–93	12	41	7	22
1993–94	10	38	6	20
1994–95	9	35	5	19
1995–96	8	31	5	17
1996–97	6	28	4	15
2000–01	5	19	3	10

a Motor vehicle and part industries (ASIC 323 / ANZSIC 281) refers to all automotive production in Australia including plan automotive production.

b The effective rate of assistance is defined as the percentage change in returns per unit of output to an activity's value adding factors due to the assistance structure.

c The nominal rate of assistance is defined as the percentage change in gross returns per unit of output due to the assistance structure.

Sources: IC (1995e).

L EXPORT FACILITATION

L.1 Past arrangements

In February 1979 the Commonwealth Government announced its decision to introduce export facilitation measures into the Government's Motor Vehicle Manufacturing Plan. The decision represented a move away from the narrow objective that an 'all Australian car' should be produced locally, towards a greater emphasis on competitiveness, trade and world markets. The Government stated that:

> In the last 12 months the Government has become convinced of the need for the Australian motor vehicle industry to become better integrated with the world industry an so enhance its long term viability and competitiveness. (House of Representatives 1979, p. 316)

The Export Facilitation Scheme's (EFS) full details were determined following two reports on export facilitation by the Industries Assistance Commission (IAC).[1] The scheme commenced in March 1982 as an extension of the existing Plan.

The main impetus for export facilitation was Holden's proposal to the Government to establish a world scale four cylinder engine plant as part of the General Motors Corporation's world car program. The ability of Holden to take advantage of the opportunity to enter into large scale engine exports was subject to the incorporation of export facilitation measures into the Plan (House of Representatives 1979).

L.1.1 The original scheme

The original intent of the EFS was to encourage manufacturing to focus on those automotive products in which Australia had a competitive advantage and to import products for which that advantage did not exist. The explicit assumption was that it would stimulate an increase in both exports and imports of automotive products.

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[1] Following the announcement of the EFS in February 1979 the Government requested the IAC report within six months on the details of the EFS before its commencement (see IAC 1979). Shortly afterwards the Government requested the IAC report on means by which specialist component producers could participate in the EFS (see IAC 1980).

Export facilitation provisions extended the concept of the by-law concession for imports offered under the local content scheme. The local content rules required that 85 per cent of the total wholesale value of domestic passenger motor vehicle (PMV) production be sourced locally. If the local content requirement was met, participating vehicle producers were entitled to import, free of duty, vehicles or components equal in value to the residual 15 per cent of wholesale value of domestic production.

Under the EFS, vehicle producers could earn additional duty free entitlements (export credits) on the value of local content in their eligible exports over and above the value of local content in eligible exports in 1979.[2] Export credits could then be used to import components free of duty on a dollar for dollar basis, or sold or transferred to other vehicle producers.[3] In 1982 the upper limit on export credits was 5 per cent of the value of plan production. This limit increased to 6.25 per cent in 1983 and 7.5 per cent in 1984.

Under the EFS, component producers could earn export credits on the value of local automotive content in their eligible exports over and above the value of local content in eligible exports in 1979. Export credits could then be sold or transferred to vehicle producers, or used to increase notional content (for the purposes of local content calculations) in components supplied to vehicle producers. The upper limit on export credits was 20 per cent of the value of original equipment (OE) component sales to vehicle producers. A higher upper limit for component producers was intended to provide a more even level of assistance between component producers and vehicle producers.

In effect, the provisions enabled vehicle producers to reduce the level of local content in their production below the specified 85 per cent (required under the local content scheme) without incurring a penalty. The incentive to export more was being provided through import concessions which also provided an incentive to import more.

L.1.2 Changes to the scheme

Three subsequent reviews of assistance to the automotive industry have led to significant amendments to EFS. These reviews were:

- a report on post-1984 assistance arrangements for the motor vehicle industry by the IAC (see IAC 1981);

2 Eligible exports were PMVs and components used in PMVs.

3 Eligible imports were original equipment components used in PMVs.

- a mid-term review of the Government's Motor Vehicle Manufacturing Plan in 1988; and
- a review of the automotive industry by the Industry Commission in 1990 (see IC 1990b).

The major amendments to the EFS are outlined in Table L.1.

The EFS has become progressively less restrictive over time. Changes to the scheme, such as allowing direct participation by component producers and vehicle importers, expanding the definitions of eligible imports and exports, and removing restrictions on the transfer of export credits, have increased the potential benefit of the scheme to participants. They have made the scheme more market oriented and improved its use as a means of further internationalising the automotive industry in Australia. However, as planned, a declining tariff rate has, over time, gradually reduced the scheme's value to exporters.

Table L.1: **Changes to export facilitation provisions, 1985 to 1996**

January 1985[a]	The upper limit on export credits for vehicle producers increased to 10 per cent in 1985, 12.5 per cent in 1986 and 15 per cent in 1987. However exports earning credits in excess of 7.5 per cent were effectively subject to what amounted to a value added threshold.
	Vehicle producers were allowed to earn export credits for exporting components under the special component producers' scheme (up to 20 per cent of original equipment sales to other vehicle producers).
	Vehicle producers were allowed to use export credits to import completely built up (CBU) vehicles duty free.
	The definition of 'eligible exports' was broadened to allow components 'substantially similar' to those used in PMVs, to qualify under the EFS.
January 1987[b]	Export facilitation provisions for vehicle importers came into effect. Under these provisions importers were able to import duty-free CBU PMVs in return for arranging exports of Australian components. Export credits were earned at a maximum rate of 50 cents in the dollar on the value of local content in exports arranged, over and above 1986 levels and was limited to 25 per cent of the CBU vehicles they import. Export credits could also be sold or transferred to vehicle producers. To qualify for the maximum rate, importers had to meet a value added threshold. The scheme was scheduled to terminate in 1992.
April 1988[c]	The upper limit on export credits was increased from 15 per cent to 20 per cent for vehicle producers and 20 per cent to 25 per cent for component producers.
	The importers' scheme was extended for two years beyond 1992.

... continued

Table L.1: **Changes to export facilitation provisions, 1985 to 1996** (continued)

	The reduction of the PMV tariff rate from 57.5 per cent to 45 per cent and the scheduled reductions of 2.5 per cent per year to 35 per cent in January 1992, effectively reduced the benefit under the EFS.
January 1991[d]	The 1979 base year hurdle applying to vehicle producers and component producers and the 1986 base year hurdle applying to vehicle importers' were abolished.
	By 1995 export credits were to be calculated on the basis of one dollar for every dollar of Australian automotive value added in the local content of eligible exports. This was subject to a phasing out of the existing arrangements, which allowed earning of credits up to 7.5 per cent without value added testing.
	Relatively complex assemblies such as engines or transmissions were deemed to be 100 per cent valued added.
	The way export credits were applied to reduce import duty was changed. One dollar of export credits earned a duty reduction equal to one dollar multiplied by the tariff rate for PMVs and OE components in the year it was earned (regardless of the tariff on the goods being imported using the credits). Previously, the tariff rate on the goods being imported duty free using export credits determined the value of the credits.
	Upper limits on the level of export credits that vehicles producers, component producers and vehicle importers could earn, were abolished.
	Restrictions on the sale and transferability of export credits were removed.
	The restriction on the direct use of export credits by component producers to reduce duty paid on imports was removed.
	The definition of eligible imports was broadened to include light commercial vehicles (LCV), four wheel drives (4WD) and replacement components.
	The definition of eligible exports was broadened to include machine tooling, automotive tooling and services relating to automotive design and production.
	Consistent with the provisions of the Closer Economic Relations Agreement with New Zealand, the EFS would no longer apply on certain exports to that country after 31 December 1992.
	A continuation of scheduled tariff reductions of 2.5 per cent per year (from 1993) to 15 per cent by the year 2000 effectively reduce the benefit offered under the EFS.

a Button (1984).
b Button (1986).
c Keating (1988).
d Hawke (1991).
Sources: Listed above.

L.2 Current arrangements

Current export facilitation arrangements commenced in January 1991 and will apply until December 2000. Despite the numerous amendments to the EFS, the primary objective of the scheme has remained the same. Current arrangements are, however, less complicated than previously.

L.2.1 Objectives of the scheme

The objectives of the EFS are part of the broader objectives of the Government's automotive industry policy. The primary objective of the policy is:

> ... the development of an Australian automotive industry that is viable and internationally competitive, providing higher quality vehicles at lower real prices to consumers. (Hawke 1991, p. 5.5)

The major aim of the EFS is to enable the local industry to improve its cost structure and competitiveness through closer integration with the world industry (IAC 1979). This has been the objective of the scheme since its conception in the late 1970s.[4] As stated by the Government when announcing the EFS:

> ... given the small domestic market for motor vehicles in Australia, the only real and effective way that the industry can improve its cost structure is through closer integration with the world industry and ... the export opportunities that this will provide. (House of Representatives 1979, p. 316)

A major focus of the scheme is to bring assistance to exports more in line with the gradually declining assistance provided to production for the domestic market. More specifically, the EFS aimed to encourage the industry to specialise and expand in segments where it was closest to being internationally competitive and import products for which it had the greatest competitive disadvantage. This was to be achieved by assisting exports of the relatively more efficient producers in the industry and providing some duty relief on imports.[5]

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4 When introduced, a specific objective of the EFS was to reduce the cost penalties imposed on vehicle producers by the local content scheme.

5 The EFS will tend not to help the least efficient sectors of the industry because assistance provided by the scheme is determined by the tariff rate times automotive value added. The least efficient sectors require the full tariff on total price plus natural protection, provided by transport costs, in order to be competitive in the domestic market.

Specialisation and expansion in more competitive areas allows the industry to benefit from economies of scale, increasing its ability to compete on world markets. As stated by the Australian Customs Service (ACS):

> ... the export facilitation scheme is designed to improve the efficiency and effectiveness of the domestic automotive industry through higher production volumes and promoting rationalisation of vehicles and components. (ACS 1995, p. 1)

The primary objective of the EFS has never been to provide a subsidy to automotive exports *per se* (despite the incentive effect of the scheme). In an interim report on the EFS the IAC expressed the view that the:

> ... rationale of export facilitation scheme should not be viewed as encouraging exports. Indeed the Commission considers there is no case for providing assistance on continuing basis to export activities per se. (IAC 1979, p. 14)

L.2.2 Operation of the scheme

The Department of Industry, Science and Tourism (DIST) is responsible for the Government's Motor Vehicle Manufacturing Plan, which is administered by the ACS. Current export facilitation arrangements will remain in force until 31 December 2000.[6] These are summarised below.

Eligible exports

Export credits can only be earned on eligible exports. Eligible exports are:

- specified PMVs;[7]
- Australian produced OE components which are identical or similar to components used in specified PMVs produced in Australia;[8]
- Australian produced OE components for use in vehicles, the export of which will 'contribute to the achievement of overall objectives of the Government's passenger motor vehicle industry policy';[9]

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6 Administrative arrangements for the automotive industry are set out in *Administrative Arrangements to the Year 2000 for the Automotive Industry* (Australian Customs Service 1994).

7 Specified PMVs covers passenger cars, passenger car derivatives (that is, station wagons, utilities, panel vans and pick-ups) assembled or manufactured in Australia.

8 Eligible components include components destined for use as OE components in vehicles which, if produced in Australia, would be considered to be specified PMVs.

9 DIST use a set of criteria to decide whether the export of the automotive components will contribute to the achievement of the overall objectives of the Government's passenger motor vehicle industry policy (see ACS 1994).

- products and services relating to the automotive products above — automotive machine tools, automotive tooling and automotive design, development and production services (excluding royalties);[10] and
- products and services of emerging technology designed initially for use as OE components in vehicles other than PMVs and which are demonstrated to have strong potential for later application as OE components in PMVs.[11]

Exports to New Zealand after 1992 are generally not eligible to earn credits.

Earning export credits

A participant in the scheme earns export credits at a rate of one dollar for every dollar of Australian automotive value added in their exports.[12] The value of imported components and imported and local raw materials are not counted as Australian automotive value added.[13]

Once earned, export credits can be used to reduce the amount of duty paid on eligible imports. One dollar of credits earns a duty reduction equal to one dollar multiplied by the tariff rate for PMVs and OE components (currently 22.5 per cent). The tariff rate per dollar of export value added therefore determines the maximum rate of assistance offered under the scheme. For example, in 1997 exports containing $100 of Australian automotive value added will earn the participant a credit worth $22.50 in import duty saving. By 2000 this benefit will have fallen to $15 as PMV tariffs drop to 15 per cent.

There is no limit to the level of export credits which can be earned by any participant but export credits and bounty assistance cannot be earned for the same exports. If credits held are not fully used in the year in which they were earned, they may be carried forward to the next year.

The right to claim export credits lies with the exporter, however once claimed, export credits can be transferred or sold by one participant to another. There are

[10] DIST use a set of criteria to determine the eligibility of products and services relating to automotive products to earn export credits (see ACS 1994, p. 17).

[11] 'Vehicles other than PMVs' refers to those under Chapter 87 of schedule 3 to the Customs Tariff Act 1995 (see Australian Customs Notice No. 96/31).

[12] CBU PMVs, CKD vehicle export programs (subject to approval by the DIST), engines and transmissions manufactured in Australia are deemed to contain 100 per cent Australian value added in the $A FOB Australian content. All other products are subject to the value added calculation.

[13] Raw materials are considered to be any product, complete or incomplete, that has its origins outside of the automotive industry.

no limits on the transferability or sale of export credits between participants, although, the ACS registers any transfers of export credits between participants.

Eligible Imports

Export credits can only be used to offset duty on eligible imports.[14] Eligible imports are:

- PMVs;
- PMV derivatives (that is, station wagons, utilities, panel vans and pick-ups);
- LCVs and 4WDs; and
- replacement components for all the above vehicles and original equipment components for LCVs and 4WDs.[15]

In addition, PMV producers may use export credits to pay duty on imports of OE components or PMVs or their derivatives in excess of the 15 per cent duty free entitlement.

L.3 Effects of the scheme

The EFS involves significant (though declining over time) intervention in the automotive market by giving assistance to exports, which is financed by tariff concessions on automotive imports. It provides a more similar level of assistance between domestic production and exports. This section examines the industry's use of the scheme, some of the likely effects of the EFS on the behaviour of producers, its contribution to achieving the objectives of the Government's automotive industry policy and its impact on the efficient allocation of the community's resources.

L.3.1 Participation under the scheme

Import duty forgone under the EFS is equal to the tariff rate (on PMVs and OE components) times the value of export credits used. The duty forgone under the EFS has been decreasing with the tariff rate since 1992. This has occurred

[14] Only vehicles which have a G.V.W of 3.5 tonnes or less and which are classified under a subheading of 8702, 8703 (other than 8703.10.00) 8704.21, 8704.31 and 8704.90 in the Customs Tariff Schedule, Chapter 87).

[15] Export credits can be used to import OE components indirectly via the 15 per cent duty free entitlement. Under the entitlement producers can use export credits to offset any import duty in excess of the 15 per cent.

despite a 12 per cent annual growth in automotive exports since 1991, because a large proportion of the that growth came from exports to New Zealand which, for the most part, are not eligible under the scheme. Exports other than to New Zealand grew by 10 per cent over the period (See Table L.2). Some activity qualifying for credits are not included in Table L.2, for example, automotive machine tool production and automotive design, development and production services.

Table L.2: Duty forgone under the export facilitation scheme and automotive exports and imports, 1991 to 1996

	1991	*1992*	*1993*	*1994*	*1995*	*1996*	*Growth*[a]
	$m	*$m*	*$m*	*$m*	*$m*	*$m*	*%*
All imports							
Vehicles	3035	3985	4577	5355	5610	5481	13
Components	1988	2414	3069	3527	3587	2104	1
Total	5023	6399	7646	8881	9197	7585	9
All exports							
Vehicles	426	451	585	594	662	882	16
Components	736	798	890	943	1118	1154	9
Total	1162	1249	1474	1538	1780	2036	12
Exports to NZ							
Vehicles	121	236	199	323	397	370	25
Components	62	78	88	92	122	134	17
Total	183	314	288	415	518	504	22
Exports eligible to earn credits[b]							
Vehicles	305	215	386	271	265	512	11
Components	674	720	800	851	996	1020	9
Total	979	935	1186	1122	1261	1669	10
Duty forgone ($ million)	**161**	**418**	**275**	**209**	**187**	**156**	
Duty forgone as a percentage of the value of eligible exports (%)	**17**	**45**	**23**	**19**	**15**	**9**	

a Compound growth rate per year (1991 to 1996).

b Does not include all exports eligible to earn EFS credits, for example, products and services relating to the automotive products — automotive machine tools, automotive tooling and automotive design, development and production services (excluding royalties).

Sources: ABS (unpublished data) and ACS (unpublished data).

L.3.2 EFS Incentives

The EFS provides assistance to eligible automotive industry exports equivalent to the *automotive value added* incorporated in those exports multiplied by the *tariff rate* on automotive imports. Hence the scheme provides an incentive to export which, for those products with less than 100 per cent automotive value added, is somewhat less than the incentive provided to production for the domestic market by the tariff on PMV imports.[16]

The resultant export credits can then be used to offset duty on certain automotive products imported by scheme participants. As the tariff declines towards 15 per cent in 2000 the assistance available to exports automatically decreases.

For automotive products in which Australia is already competitive on world markets (that is, which would have been exported in the absence of export assistance) the EFS provides a windfall gain. For products which have a price disadvantage on world markets by as much as the tariff rate times their automotive value added, the EFS will potentially make exports profitable and will thereby encourage higher output.

For opportunistic exports, (for example, short term marginal additions to existing production) firms would take account of the current tariff rate in factoring in the value of the EFS benefit. However, because many automotive exports will require some additional investment and/or be part of longer term strategic decisions by multinational firms, some sort of average tariff rate over the length of the investment will tend to be used by firms assessing the impact of the EFS on the viability of planned exports. As the size of the incentive has been declining with ongoing tariff reductions, the longer run incentive will be considerably lower than that in the short run.

The simplification and increased flexibility provided by the 1991 amendments mean that the EFS offers a similar incentive to all sectors of the PMV industry. However, some sectors will have different options to avail themselves of EFS benefits and these are now considered in more detail.

PMV producers

PMV producers have the widest range of alternative means of benefiting from the EFS. These are:

- Exporting vehicles. Because of the EFS, these exports can still be profitable at a free-on-board price which is below their total production cost, by up to the Australian import tariff rate times their automotive value added (this amount is the saving on duty on imports brought in using export credits). A similar situation ensues for components manufactured by PMV producers and included in vehicle exports.

[16] Locally manufactured PMVs, engines, transmissions and approved CKD vehicle exports are deemed to contain 100 per cent automotive value added. Hence the EFS gives these products assistance similar to that available to production for the domestic market.

- Incorporating domestically produced automotive components in exported vehicles. The EFS provides the capability to pay a price for components above import prices by as much as the tariff rate times the automotive local content in those components.[17] If components are already sourced locally on a minimum cost basis, their EFS benefits can be fully taken into account by PMV producers when making export decisions regarding vehicles. How the value of EFS credits is distributed between assemblers and component manufacturers will be partly determined by the bargaining power of the firms involved and partly by the incentive needed to make the exports profitable (ie the amount the PMV producer must keep).
- Obtain export credits in return for arranging export of domestically produced components (usually to their overseas parent companies).
- Obtain export credits from component producers as part of a deal to purchase components for locally produced vehicles. In this instance the price paid for components will incorporate some allowance for the value of the export credits.
- Purchase credits on the open market.

The EFS will particularly advantage integrated exporting and importing firms such as the PMV producers because they are able to use the export credits themselves. In addition these firms are likely to be in a strong bargaining position with component suppliers to expropriate any surplus value of credits. Because the credits are not in the form of cash their value to firms which cannot use all of their credits directly, will be less than the full benefit as there will be some transaction costs and bargaining losses.

Component producers

The EFS will give component producers a similar incentive to directly export as they do for PMV producers. These firms may not receive the entire value of the EFS. They usually do not use the credits for importing, and there is likely to be some loss of value in the trading process. However, indications are that credits are traded on the open market for close to their full value.

[17] Only for vehicles which have a substantial export focus (for example the Ford Capri), will the EFS create a significant advantage for local component producers. Models where only a small proportion of output is exported the EFS will provide only a marginal price advantage for local components as the EFS benefits would not apply to the bulk of production. If an additional component were being added to only the exported model, then domestic component producers would then have the full price advantage offered by the EFS. However, in this instance production volumes of the component would only be small and it is unlikely that domestic component suppliers would be competitive.

In addition, some of these component exports are the result of intercession of either domestic PMV producers or specialist importers with their overseas parent companies in return for the resultant export credits. Some loss of value in transferring credits to these intermediaries would be expected in return for this ‘marketing’ role.

Component exports will also occur indirectly as part of vehicle exports. The rights to the resultant export credits accrue to the PMV exporter and hence any value of the EFS to the component producer is likely to be small in this case. The benefit will often be in the form of PMV producers being able to pay above world price for components incorporated in exports.

Automotive Importers

Vehicle importers (including domestic vehicle producers that import) have an incentive to use Australian components in their overseas operations to the extent that the tariff saving from export credits offset the cost disadvantage of the Australian components. These components could come from specialist producers or from establishing or retaining their own component operation (for example, Nissan’s aluminium casting operation)

Importers can also purchase credits on the open market, although anecdotal information suggests that they will generally pay close to the full value of the credits, suggesting little saving for them. The high market price for credits suggests very little additional substitution of specialist importers’ vehicles for local production as a result of the EFS.

L.3.3 Evidence on the impact of the scheme

Trends in exports and imports

The incentives provided to exports by the EFS have gradually declined over time. In the first six years of its operation the EFS provided particularly high incentives for local PMV producers to export. The local content scheme imposed prohibitive barriers to PMV producers falling below 85 per cent local content. Export credits enabled duty free replacement of very high cost local inputs in excess of the 15 per cent duty free allowance and hence had a potential value in excess of the tariff on imported components. Following removal of the local content scheme the value of export credits was reflected by the tariff on eligible automotive imports. As detailed in section L.1.2, a raft of changes to the scheme were introduced in 1991 which overall made the scheme more attractive to exporters and importers by simplifying the scheme and enabling credits to be traded without restriction among scheme participants.

After allowing for lags in responding to the schemes incentives, this pattern of assistance suggests that exports should show fairly rapid early growth, gradually tapering off as the incentive provided by the scheme starts to decline. Eventually exports could even fall, as those which required significant levels of assistance became unprofitable with the decline in value of EFS credits. However, there have also been improvements in the industry’s productivity and quality performance, particularly since 1990, which in some instances, will have more than offset the decline in EFS benefits. Also the automotive industry is characterised by long product cycles during which it is often difficult for new suppliers to gain market share. This will tend to delay responses to new assistance incentives.

Because of these long decision and production lags in the automotive sector, significant new export programs are still occurring, particularly in the assembly sector, despite declining EFS incentives. DIST (1995b) forecasts that automotive exports will grow from $1.8 billion in 1995 to $2.8 billion in 2000. Participants comments indicate that the EFS is an important initial stimulus for these new export plans. For example, Holden indicated that the EFS was crucial to the decision to base Asian production of the first model Vectra in Australia (sub. 19) and would still be so (at the year 2000 level of assistance) to justify retention of the second model (PHtrans., p. 426).

DIST (1995b) indicates that automotive exports grew by 18 per cent per year from 1984 to 1990. Growth then slowed to an annual average of 12 per cent between 1990 and 1996. Removing exports to New Zealand (which have not attracted credits since 1992) lowers this latter growth rate to 10 per cent (see Table L.2). However, factors other than the EFS will also have encouraged automotive exports. Some factors, for example the significant competitive advantage provided by devaluation of the Australian dollar since 1985 and cost savings from microeconomic reform — will also have provided some stimulus to exports from other industries.

In this regard, total Australian exports of goods showed an annual increase of 12.5 per cent between 1984 and 1990 (well below the growth of automotive exports) while total manufacturing exports increased by 15 per cent per year. Between 1990 and 1995 exports of goods increased by 7 per cent per year and manufactured exports by 14 per cent. These figures suggest that the impact of the scheme has been small in recent years, with exports under the scheme growing more slowly than unassisted exports in other industries.

The other less direct impact of the EFS is an increase in the level of automotive imports with duty free access to the Australian market. While this may have led to some increase in imports (particularly while the local content scheme was operating) it is very difficult to disentangle this effect from the impact of the decline in protection for the sector since 1988. Between 1988 and 1995 automotive imports rose by 14 per cent per year. This compares to total manufactures import growth of 4 per cent per year.

Participants' comments

Participants have strongly supported the EFS as an integral part of the assistance framework for the PMV industry. It is viewed as having provided the necessary impetus to obtain entry into export markets which are seen as crucial to achieving the volumes needed to be competitive with lower assistance.

A large number of component manufacturers have indicated that the EFS plays an important part in their continuing and in some case, expanding operations in Australia. They have argued that the incentives being provided by the EFS have enabled them to obtain a foothold in international markets from which they can expand their exports. In addition, firms appear to have come to see the EFS as offsetting a range of disadvantages faced in international markets. Robert Bosch Australia (RBAU) indicated that:

> The export facilitation scheme provides RBAU with valuable assistance in securing export contracts by helping to reduce the cost disadvantages inherent in Australia's geographic location in relation to major world markets. In effect EFS provides an entry ticket to the global negotiating table and enables RBAU (and Australia) to be seen as a potential competitive source. (sub. 65, pp. 6–7)

Hella Australia also supported the EFS:

> The EFS is, first of all a marketing tool that makes Australia attractive for overseas car manufacturers to source from Australian component suppliers and tool manufacturers. It supports export companies to operate on the same level as their competitors. The present competition is more and more a competition among countries and governed by factors which are out of reach of the competing companies. It also softens some of the disadvantages of the Australian industry such as freight costs and import duty at the destination. (sub. 11, p. 17)

BTR Automotive Engineering saw the EFS as compensating for freight and other costs of dealing in export markets:

> For some of the bulky items currently exported by BTR, these costs will not be covered by the current EFS arrangements by the year 2000. In fact, we will need to be 5 – 10 per cent cheaper at the factory door to compete. Structural differences such as GST or competitive aluminium costs, exist in competitor countries giving a more competitive cost structure regardless of factory design productivity. (sub. 53, p. 11)

Pilkington (Australia) had a similar view regarding its successes on export markets:

> Of course we had to demonstrate internationally competitive levels of cost, quality and delivery in order to qualify, but EFS was the mechanism by which we overcame the problems of tariff and non-tariff barriers, distance, language, lack of close engineering support and, in the case of rival suppliers from the USA and some European countries, political pressure. EFS provides a reason for international car companies to source some of their glass requirements with us rather than with some other foreign glass supplier. (sub. 50, p. 2)

Some of these views of the role of the EFS are somewhat broader than the original objectives of the scheme. The EFS aimed to encourage firms to become involved in world markets rather than to provide ongoing compensation for transport costs and overseas tariffs. Participants' comments provide an insight into the difficulty of limiting more innovative assistance approaches like the EFS, to their original objectives. Once new arrangements become an established part of the assistance framework they tend to encourage production which is dependent on ongoing assistance.

The objectives that many participants have ascribed to the EFS cover cost disadvantages faced by many if not most Australian exporters. To provide the PMV industry with assistance simply to overcome these difficulties would further discriminate against more lowly assisted industries which have no industry-specific export scheme.

Holden's analysis of the impact of the EFS was more in accord with the original spirit of the scheme.

> The scheme seeks to remove the bias of manufacturers towards sale on the local market. When this effect is combined with the progressive lowering of assistance, the net result is a powerful impetus for producers to make the transition towards volume expansion through export activity. This is an essential element of the structural change the industry must make if it is to be viable at relatively low levels of assistance. (sub. 19, p. 48)

The strategy being followed by many firms in the PMV industry is to have a combination of a strong domestic sales base and incremental and growing exports to achieve scale economies. Participants submitted that the EFS had been very important in achieving this strategy and continued to be needed if exports were to be maintained.

Support for the EFS was maintained by industry and State and local government submissions on the Draft Report, which overwhelmingly argued for the continuation of the EFS or some other WTO acceptable alternative providing equivalent benefits for automotive exports.

L.3.4 Achieving plan objectives

Changes in assistance arrangements for the automotive industry since 1982 have generally aimed to improve the industry's competitiveness and to develop an international focus. The role of the EFS in this strategy is to encourage increased scale and efficiency of production together with integration with the world automotive market through exports. As a corollary the tariff relief available from export credits may lead to some higher cost domestic production being displaced by imports.

One prerequisite for the EFS to have contributed to these objectives is a significant increase in exports in eligible automotive products. Automotive exports grew particularly rapidly between 1984 and 1990 which, in conjunction with participant's comments, suggests significant success for the scheme in encouraging and helping to maintain exports.

Whether this export growth has contributed to the overall plan objectives is harder to determine. In this regard the EFS is part of an overall package of measures and it is difficult to disentangle the impact of any one element. Productivity and quality have improved in recent years and the exposure to export markets encouraged by the EFS will have played an important role. However, the objective of lower real prices for consumers has not been achieved. Even with expansion of exports, domestic producers have not in general achieved the volumes and competitiveness needed to enable lower real prices of motor vehicles on the domestic market. For the component sector the recent widespread achievement of annual cost downs to assemblers suggests more success in containing prices. Exposure to international markets and greater scale of production encouraged by the EFS will have played a part in facilitating these improvements.

Greater import substitution is the less publicised but implied side of the desired impact of the EFS. However, while expansion in export volumes might reasonably be linked to the EFS, it is more difficult to attribute the observed increase in imports to the impact of the scheme. Reductions in assistance and withdrawal of local manufacturers from the car market have seen substantial import growth independent of any duty saving from export credits. Because automotive imports are significantly higher than automotive exports, export credits can be used on imports which would be entering in any event and there is no stimulus to further imports. However, to the extent that importing firms use the net duty savings to lower prices there will be an expansion of imports flowing from the EFS.

While participants' comments suggest that the EFS has helped achieve some of the Government's objectives for the industry, they also imply that it has created ongoing reliance on assistance to exports as well as protection in the domestic market. Holden (sub. 19) indicated that exports of both the first and second generation of the Vectra will depend on some form of support, at least until tariffs in regional markets are lowered. South Pacific Tyres (sub. 57) stated that a large proportion of its $75 million in exports would be at serious risk without the EFS.

In addition, there are firms at the fringes arguing that they are discriminated against by not being allowed access to the scheme (for example, for truck production or for royalty payments for product patents). This generates pressure for further extensions of assistance to cover perceived anomalies.

L.3.5 Resource allocation effects

The initial impact of the EFS is to increase the assistance available to the automotive industry through indirect assistance to exports. This will tend to provide more equal assistance to the strictly automotive activities within the industry. However, Mitsubishi argued that the value added test for EFS credits created additional distortions between activities in the automotive industry.

> MMAL believes that there is a strong case to eliminate the current discrimination in the EFS against most component exports. Currently the scheme provides for export credits on all component exports, except engines and transmissions, to be measured by reference to value added rather than local content. This runs counter to the intra-industry efficiency principles espoused by the Commission in its 1990 Report, creates anomalies in the treatment of identical components depending on the form in which they are exported and without justification creates “good” and “bad” classes of automotive exports. (sub. 34, p. 21)

Johnson Matthey (sub. 42) expressed similar views. These concerns highlight the distortionary impact of differential assistance between activities, which by its nature supports resource use in the favoured activity. Such effects are starkly apparent when the differences in assistance occur between sectors of the automotive industry with varying degrees of automotive value added[18]. As discussed in Chapter 8, to remedy the intra-industry differences in nominal assistance to output would further add to the discrepancy between assistance to the PMV industry and the rest of the economy.

The EFS will worsen inter-industry resource allocation by further improving the PMV industry's ability to compete for resources with industries already receiving lower assistance. To provide some counter balance, this increased assistance is in the form of tariff relief on automotive imports. Hence there is potential for resource allocation improvements if tariff rebates encourage the replacement of the least competitive local production by imports. However, a number of factors suggest that this impact will be small.

The 1990 Industry Commission report on the automotive industry argued that with the removal of the local content scheme there were no longer incentives to use export credits for replacing the highest cost local production.

> The cost of producing in Australia many of the components (and vehicles) currently sourced duty free using export credits would almost certainly exceed the duty paid price of the imported equivalents. In the absence of export facilitation, it would be rational for vehicle producers to continue to import these items duty paid. (IC 1990b, p.68)

In addition, there will usually be costs involved in earning export credits. Hence, only a portion of the amount of the credit will be available to lower the price of imported automotive products. In the extreme case where the full value of EFS credits is needed to justify an export activity, the resultant imported good will be imported tariff free but will need to be sold at a tariff inclusive price to recover the cost of earning the export credit. The full value of the duty saving will need to be transferred to the exporter to justify the export production and there will be no substitution of imports for domestic production. Ford indicated that the full value of the import duty saving from EFS credits on their exports was needed to make the exports viable (PHtrans., p. 285). The comments of many other participants regarding the importance of the EFS in the profitability of their exports suggests that a significant share of exports fall into this class.

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18 Some participants (Johnson Matthey, sub. 110 and Mitsubishi, sub. 104) have interpreted this reference as justifying removal of value adding testing. However, the point being made is that this is a situation *within* the automotive industry which demonstrates the impact on resource use that assistance differences between activities can cause. This in turn highlighted the potential costly distortions to resource use *between* industries, created by providing favoured levels of assistance to the automotive industry. Removing value added testing, while reducing assistance distortions within the PMV industry will further exacerbate the distortions between the PMV sector and the rest of the economy.

Similarly where an export credit is purchased from the earning firm at a price close to the full duty saving, there will be little room for price reductions on the resultant imports.

On the other hand, those exports which are already competitive on world markets will potentially provide the full EFS credit as a price reduction on imports and hence will provide greater potential for substitution of imports for domestic production. However, the price for credits traded on the market appears to be close to face value reflecting the significant excess of automotive imports over exports. This suggests that exporters are obtaining most of the benefits of the scheme with little impact on imports.

In the assistance environment since the abolition of the local content scheme, the EFS, viewed in isolation, increases the already above average assistance provided to the automotive industry. Hence, it further favours the industry in competing for resources. The EFS has stimulated exports, many of which appear to need ongoing subsidy to remain profitable, even in the long term. Comments from many participants suggest that the EFS remains very important to the success of their export programs for the foreseeable future.

Alternatively, viewed as part of the total assistance package to the industry, the EFS may have allowed protection against imports to have been lowered more rapidly than would otherwise have been the case. This would mean that a predetermined level of assistance was given to the industry in a manner which lessened discrimination between exports and import competing activities (that is a lower tariff than otherwise as a result of the existence of the EFS). Whether this was the case is a matter for conjecture.

When the EFS was introduced it potentially lowered the protection available to high cost domestic component production by allowing assemblers to decrease their local content below 85 per cent. Hence the assistance it provided to exports also had an automatic impact of reducing the assistance to the import replacement sector of the industry. As dicussed above and in Section 8.6, this effect on imports is now significantly dissipated. Hence the EFS now provides assistance to exports without any offsetting decline in assistance to production for the domestic market. As a result, in itself the EFS adds to the total quantum of assistance provided to the industry.

However, it is possible that the existence of the EFS may have provided the government with the opportunity to lower tariffs more rapidly than otherwise. Hence, in this indirect way, the EFS may still have had an offsetting negative impact on assistance provided to the industry’s production for the domestic market.

M HISTORICAL SIMULATIONS

M.1 Introduction

This appendix reports on the application of the MONASH model to study some of the factors that affected the automotive industry between 1986–87 and 1993–94. It represents the first stage of the economy-wide analysis of the impact of the tariff. The purpose of the historical analysis is to provide an up-to-date database, to identify how technology and consumer preferences changed over the years, and to provide insights into the impact of these factors on the automotive industry. Identifying these factors helps our understanding of the contribution of the tariff and other factors to the performance of the industry and the economy. Further details about the methodology are in Appendix O.

M.2 Observed changes, 1986–87 to 1993–94

Input–output data are published less frequently than other sources of ABS data. In the historical analysis, these other sources of data are used to update the input–output data. The most important variables relating to the motor vehicle industry are shown in Table M.1. Between 1986–87 and 1993–94, output increased by 14.5 per cent, exports by 51 per cent and imports by 64 per cent. These changes imply an increase in sales in Australia of about 31.6 per cent over the period. This was larger than the increase in GDP (18.8 per cent).

The average foreign currency price of imported motor vehicles rose 24.6 per cent, primarily because of the appreciation of the yen. The depreciation of the Australian dollar contributed to the price of imported cars before payment of duty rising by 28.9 per cent. However, the price of imported cars after payment of duty increased by only 20.5 per cent because of the 30.3 per cent decrease in the tariff rate.

The reduction in protection for the motor vehicle assembly segment of the automotive industry is greater than that stated in Table M.1. This is because the reported change in protection of the automotive industry is an average of a large reduction in protection to motor vehicle assembly and a small reduction in protection to other motor vehicle products.

Table M.1: **Changes in the automotive industry, trade and macroeconomic variables, 1986–87 to 1993–94** (per cent)

Variable	*Total change*
GDP	18.8
Production of the automotive industry	
Output	14.5
Labour	-17.5
Capital stock	0.0
Total domestic sales of motor vehicle products	31.6
Exports of motor vehicle products	
Volume	51.0
Export prices in foreign currency	29.2
Export prices in domestic currency	33.5
Imports of motor vehicle products	
Volume	64.0
Import prices in foreign currency	24.6
Import prices in domestic currency	28.9
Import prices in domestic currency, including duties	20.5
Protection of the automotive industry	
Tariff rate	-30.3

Source: Dixon, Malakellis and Rimmer (1997). **Output**: Commission's estimate based on data from the DIST survey and ABS. **Labour**: hours worked, ABS data from the Manufacturers and Labour Force Surveys. **Capital stock**: Commission's estimate based on the DIST survey data. **Export and import volumes**: ABS Cat. No. 5215.0 (various years) and unpublished ABS data at the 5-digit SITC level mapped to input–output commodities using an unpublished ABS concordance. **Foreign currency export and import prices**: unpublished export and import price deflators by 4-digit group. **Tariff rate**: IC (1995e). **GDP**: ABS Cat. No. 5206.0 (various years).

One measure that can be used as an approximation for output is value-added. For most industries, value-added is a relatively stable proportion of the total value of output. However, this is not the case in the automotive industry because the cost of intermediate inputs represents such a high proportion of the total value of output. Therefore changes in profitability over the business cycle show up as larger changes in value-added compared to the total value of output. For this reason, an alternate measure of output was sought.

The alternate measure is the number of cars produced (using confidential data collected in the DIST survey of motor vehicle assemblers), with adjustment for changes in fleet composition and model features.

Taking into account the estimated increase in output of the assembly industry and the observed growth in exports of automotive products, the growth in output of the entire automotive industry was estimated to be 14.5 per cent.

There are four available sources of information on labour input, namely the ABS Labour Force Survey, DIST, AIA and ABS Manufacturing Survey. In comparing the four sources, the latter three were found to be consistent with each other but differed from the Labour Force Survey. In particular, they recorded a much larger reduction in employment than the Labour Force Survey.

ABS offered several reasons for this. The last three surveys are based on surveys of manufacturers while the Labour Force Survey samples households. The ABS determines the industry classification for respondents in the manufacturing survey while respondents determine their own industry classification in the Labor Force Survey. The rise in the use of contractors may lead some households to classify themselves as working in the automotive industry although the ABS places them in the industry that supplies the service. For these reasons and because of the data consistency between the DIST, AIA and ABS Manufacturing Survey, the change in the number of employees was based on the ABS Manufacturing Survey.

The ABS Manufacturing Survey recorded a 20.4 per cent decrease in the number of employees between 1986–87 and 1993–94. This consisted of a larger percentage reduction in the number of employees in the assembly industry and a smaller percentage reduction in the rest of the industry. Hours worked are not recorded in this survey. However, the Labour Force Survey recorded an increase in the number of hours worked per employee of about 3 per cent. Taking both into consideration, the number of hours worked was estimated to have declined by 17.5 per cent over the period.

Capital stock for the whole industry was assumed not to change over the period. This assumption is partly based on the observed changes in capital stock of vehicle assemblers,[1] and the following considerations.

The capital stock of car assemblers fell between 1986–87 and 1993–94. However, in 1986–87, the capital stock for car assemblers was unusually high because it was a transitional year; old models were being phased out and new

1 Change in the real value of total fixed assets as identified in the DIST survey of motor vehicle assemblers.

models introduced. It is unlikely that the observed decline in the assembly sector also occurred in the components sector of the industry.

Further, there has been rapid growth of exports of car components which is likely to have induced investment.

An alternative to the above approach would have been to use data on capital stock growth for manufacturing industries and investment in the Transport Equipment Industry. However, these estimates would be less precise because they would be derived using aggregate data. Further, they would be based on the perpetual inventory method using investment data collected by ABS. This may not capture the effects of factors such as asset write downs caused by premature asset disposal.

M.3 The contribution of factors affecting the output of the motor vehicle industry

Two participants, The Member for Hindmarsh (sub. 157) and Mr Michael Cronin (sub. 139), were concerned that the values used for the elasticity of substitution between imported and Australian made cars (Armington elasticity) for both consumers and firms are too low.[2] They argued that this would underestimate the effect of tariff changes on motor vehicle production in Australia.

The sensitivity of the modelling results to the value of Armington elasticities is evaluated by performing two simulations. In simulation (a), the elasticity of substitution between foreign and domestic motor vehicles is 5.2.[3] In simulation (b), the elasticity is increased to 10.

The impact on motor vehicle production of modelling with different estimates for the substitution elasticity are discussed below. An important point is the positive relationship between the gains from reducing the tariff and the assumed value of this elasticity. The higher the elasticity of substitution, the larger the effects of resource misallocation from a given tariff. This is illustrated in the sensitivity test, where the reduction in the tariff on motor vehicles was estimated

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2 As the price of imported cars decreases relative to that of Australian made cars, consumers tend to switch their choice towards purchasing the imported car because it is relatively cheaper. The parameter describing this behaviour is known as the Armington elasticity.

3 Based on econometric evidence (Alaouze, Marsden and Zeitsch 1977).

to have increased real GDP by 0.11 per cent in simulation (a) and 0.14 per cent in simulation (b).[4]

The major factors affecting the level of output of the automotive industry, as suggested in the historical analysis, are shown in Table M.2. Each figure is interpreted as the impact of the factor on motor vehicle output assuming that there were no changes in the other factors. The individual contributions sum up explaining the observed increase in the value of output of 14.5 per cent.

In simulation (a), the largest negative influence on motor vehicle output was the shift in consumer preference towards imported motor vehicles. One possible explanation is the abolition of import quotas on motor vehicles, a change which is not captured by other variables. It induced a change in the supply of imported cars, from mainly luxury cars to a broader range of car sizes and features.

Although the quota was not binding in 1986–87, because of particular circumstances in that year it may still have limited the strategic decisions of importers, particularly for those who could not exactly match imports to the share of the aggregate demand for cars that the quota afforded them. Abolishing the import quota also increased competition and diversity by allowing new entrants, for example Korean manufacturers, to sell in Australia at the low end of the market without obtaining quota rights.

Finally, since abolishing the quota, and reducing the level of government intervention and regulation, the domestic automotive industry has increasingly specialised in the production of larger cars.

The influence of this change in preference is less in simulation (b). This is because the higher elasticity of substitution between imported and domestic vehicles increases the ability of the observed decrease in the basic price (including tariff) of imports relative to domestic vehicles to explain the increase in market share of imports.

4 The results in Appendix N assume the elasticity of substitution between foreign and domestic cars is 5.2, generating more conservative gains in real GDP from tariff reductions than if an elasticity of 10 were used.

Table M.2: **Contribution of factors to changes in the output of the automotive industry, 1986–87 to 1993–94** (per cent)

	Simulation (a)[a]	*Simulation (b)*[a]
Negative influences		
Increase in preference for imported vehicles by all users	-12.68	-10.04
Reductions in the tariff on motor vehicle products	-6.04	-11.48
Apparent changes in rates of return	-5.18	-8.10
Primary factor productivity in other industries	-4.08	-9.25
Changes in the composition of GDP	-2.48	-1.24
Changes in consumer preference for all other commodities	-0.72	-0.73
Positive influences		
Shift towards the use of motor vehicles in industrial production and productivity improvement in the use of transport and retail services	17.27	19.07
Growth in aggregate employment	12.23	13.95
Shifts in foreign demands and supplies	4.57	5.78
Increase in consumer preference for motor vehicles	4.15	4.12
Changes in import preference by all other users	2.42	3.91
Primary factor productivity in automotive industry	2.24	3.95
Shifts in export supply curves	1.79	3.05
Reductions in the tariff on other commodities	1.03	1.52
Influence of all factors[b]	**14.50**	**14.50**

a Simulation (a) assumes a value of 5.2 for the elasticity of substitution between foreign and domestic motor vehicles and simulation (b) assumes that it is 10.

b Numbers may not add up to total due to rounding.

Source: MONASH historical simulations

The second most negative influence on the output of the industry was the reduction in the tariff on motor vehicles. It contributed to reducing motor vehicle output by 6.0 per cent in simulation (a) and by 11.5 per cent in simulation (b). Doubling the elasticity of substitution also doubles the effect of the tariff on domestic production. In simulation (b), the reduction in the tariff is the largest negative influence on the output of the automotive industry.

The negative effect of reductions in the automotive tariff is partly offset by reductions in the tariff protection for other manufacturing industries. These tariff reductions contribute around a one per cent increase in motor vehicle output.

The changes in rates of return mainly reflect that the observed rate of return in the automotive industry appeared low relative to the economy-wide average. At the same time, the rate of return for the mining industry appeared to be relatively high. In the MONASH historical simulation, it is assumed that these rates are not sustainable in the long run. Shift variables were used to allow the rates of return observed in 1986–87 to differ from those expected in the longer term. Increasing the target rate of return for the automotive industry and reducing it for mining industries lead to a negative impact on the automotive industry.

Increasing the rate of return in the automotive industry causes an increase in its cost of production and the price of domestically produced cars. This, in turn, leads to an increase in substitution towards imported cars and a loss of market share by Australian producers.

Between 1986–87 and 1993–94, there was a change in the composition of GDP, with a decrease in investment and increases in government consumption, private consumption and the balance of trade as a share of GDP. Although investment is only 20 per cent of GNE (that is, GDP net of the trade balance), business expenditure on motor vehicles accounts for over 30 per cent of motor vehicle sales. The change in the composition of GDP reduced motor vehicle output by 2.5 per cent in simulation (a).

This effect is halved in simulation (b) because imports of motor vehicles are twice as sensitive to a decrease in the import price of cars arising from appreciation of the exchange rate.

The largest positive influence on the output of the automotive industry arose from changes in the efficiency with which intermediate inputs were used in the economy.

About half of this improvement came from a reduction in the use of margin commodities, such as transport and retail trade services. That is, each unit of final sales required less of these inputs.

The other half of the gains in efficiency from intermediate input use[5] came from changes in the mix of intermediate inputs used to produce each unit of output. There was a switch towards the use of motor vehicles, with reductions in the use

5 For the purpose of this discussion, intermediate inputs and use include the use of inputs for current production and investment purpose.

of other intermediate inputs and primary factors. One possible explanation may be the trend by business to use motor vehicles as part of salary packages.

In the MONASH model, when distributing overall productivity improvements to industry, it is necessary to make an arbitrary assumption about the amount allocated to intermediate goods (inputs). In this study, it was assumed that technical change in the use of intermediate inputs would be cost neutral on post-tax (subsidy) prices. Although these changes were cost neutral after inclusion of taxes, they generate a reduction in the resource cost before taxes. That is, they reduced the undistorted resource cost of producing goods and services and therefore resulted in an overall productivity improvement for the economy. Such improvement represents allocative efficiency gains. These gains are captured as taxes (and transfer payments) so that the after-tax cost of production does not fall. In aggregate, these effects were assumed to have contributed a 2.75 per cent increase in productivity. This productivity change was positive for the automotive industry because it involved a shift towards the use of motor vehicles as an intermediate input.

Many of the products favoured by the switch in the use of intermediate inputs, such as motor vehicles and electronic equipment, are also products that have high import shares. The change in the usage pattern of intermediate inputs increases both domestic production and imports. However, some cost efficiencies are not being passed on to the users of these goods and, as a result, their costs do not go down. In consequence, the real exchange rate depreciates, making imports more expensive. In scenario (b), this causes a greater substitution towards domestic production, leading to a positive impact on the automotive industry.

The other source of productivity change affecting the automotive industry is related to improvements in the use of primary factors (labour and capital). Primary factor productivity improvements in the automotive industry have a positive effect on automotive output.

However, the productivity improvement in the automotive industry was lower than that in the rest of the economy. This form of productivity improvement is one important source of real wage rises in the economy. In this analysis, real wage relativities are maintained across industries. In this case, the automotive industry experiences real wage increases based on average productivity improvement across all industries, which is greater than its own improvement. Therefore, its real cost of production rises, leading to higher output prices, reduced demand and a substitution towards imports.

In simulation (b), the substitution response to the effects of changes in primary factor productivity of the automotive industry and other industries is greater.

This is because the substitution between imports and domestically produced cars is more sensitive to changes in relative prices.

The second largest positive influence on motor vehicle output was the general growth in the economy arising from the increased use of primary factors. This is seen in the growth of aggregate employment, which increased output in the motor vehicle industry by 12.2 and 14.0 per cent in simulations (a) and (b) respectively.

Shifts in foreign demands and supplies increased motor vehicle output by 4.6 and 5.8 per cent in simulations (a) and (b) respectively. These shifts include the 24.6 per cent increase in the average foreign price of imported motor vehicles and the increased demand for all manufacturing exports including motor vehicle exports. The increase is larger in simulation (b) than in simulation (a) because the demand for domestic motor vehicles is more sensitive to the 24.6 per cent increase in the foreign price of imported motor vehicles.

Shifts in export supply may partly capture the effect of the export facilitation scheme (EFS). For any given price for exports, firms are willing to export a greater volume of cars and components under the EFS.

Between 1986–87 and 1993–94, aggregate household consumption of motor vehicles increased by more than that attributable to changes in the number of households, household income and the prices of goods and services. In historical mode, the MONASH model indicates there was a shift in consumer preferences favouring the consumption of motor vehicles. This contributed to an increase of 4.1 per cent in output of the automotive industry. Changes in consumer preferences for all other goods and services had only a small negative effect on motor vehicle output.

M.4 Summary

The analysis shows that between 1986–87 and 1993–94, many factors have influenced the performance of the automotive industry. The reduction in the tariff is one of a number of important factors, but by no means the only factor. Changes in consumer preferences, technology, the composition of final demand, incomes, and the sources of economic growth are also important factors.

The contribution of some factors is sensitive to the degree of substitutability between imported cars and Australian produced vehicles. As in the past, the future performance of the automotive industry will not be determined simply by the level of the tariff, but by a range of factors.

N THE ECONOMY-WIDE EFFECTS OF REDUCING THE TARIFF

N.1 Introduction

The Commission contracted the Centre of Policy Studies to undertake an analysis of the economy-wide effects of reducing the tariff on passenger motor vehicles using the MONASH computable general equilibrium model.[1] This model, as with all models, is a simplification of the real world. Users of formal models need to consider carefully the results generated by them. There may be aspects of an industry's structure or behaviour that are not included either because of a lack of data and econometric studies or because the mathematics is intractable. However, this does not mean that these aspects are of little importance. Further, the uncertainties about data and behaviour embedded in mathematical models need to be taken into account when interpreting the results which are presented with apparent numerical precision. Although it is a simplification, the model does provide some additional insights into the tariff issue that cannot be obtained from other forms of analysis. The modelling work reported here has drawn on the extensive comments on assumptions and options provided to the Commission through numerous submissions received throughout this inquiry. The analysis evaluates the reduction in the tariff from 15 to 5 per cent, commencing in the year 2000–01. The entire period of the analysis is from 1997–98 to 2009–10 and consists of four scenarios (A, B, C and D).

In scenarios A and B, the tariff is reduced to 5 per cent by the year 2004–05. In scenarios C and D, the tariff is reduced more slowly so that it reaches 5 per cent by the year 2009–10. For each time profile, two estimates are derived. One assumes the market structure of the automotive industry is based on perfect competition and constant returns to scale. Assuming perfect competition, by 2009–10, the gain from reducing the tariff from 15 to 5 per cent by 2004–05 is 0.025 per cent or $76 million in terms of real consumption in 1995–96.

The second assumes economies of scale and imperfect competition. Under this assumption the gain is 0.228 per cent, or $689 million.

1 The MONASH model is described in Appendix O.

The constant returns to scale case provides the absolute minimum (and in the Commission's view, the most conservative) estimate of the gains that can be expected from reducing the tariff on passenger motor vehicles and components, while the economies of scale case provides a more realistic scenario.

In the case of perfect competition, the benefits are smaller, but there is little adjustment required. In the case of economies of scale, gains are significantly larger, but more adjustment may be requires, possibly over a shorter period of time in one region.

Beside the economies of scale case used here, there are many reasons why the likely gains will be greater than those reported for the perfect competition case. One example is that it is assumed here that in the long-run there is no net increase in employment as a result of reducing the tariff. However, if the increases in real wages in the economy were slightly lower, employment would increase and the gains from reducing the tariff would be larger. As another example, it is assumed that there are no improvements in productivity attributable to the reduction in the tariff. Such increases would also increase the gains from reducing the tariff.

The Commission has deliberately chosen conservative assumptions so as not to overstate the gains from reducing the tariff. These assumptions include trends in consumer preferences, terms of trade effects, and improvements in the industry's cost efficiency that are stimulated by reducing the tariff and therefore the price of imports. The implications of these assumptions are discussed in further detail in Appendix P.

In the following sections, the basecase (against which the changes to the tariff are compared) is described, the simulated scenarios are outlined and the results presented.

N.2 Basecase

The basecase outlines a possible structure of the economy for the period 1997–98 to 2009–10. It is based on assumptions regarding key macroeconomic variables, international commodity prices, tariff schedules, changes in consumer preferences and technology and other factors. The assumptions applying to the basecase also apply to the tariff scenarios (A, B, C and D) unless otherwise changed as part of these scenarios.

Aspects of the basecase describing the macroeconomy and prospects for the automotive industry are outlined in Table N.1. Also included in the table for comparison are the corresponding data for the period 1986–87 to 1993–94.

Although the data are presented as annual averages, year-by-year variations have been incorporated, reflecting business cycles.

Table N.1: **Macroeconomic and motor vehicle variables in recent history and in the basecase**
(average annual per cent changes)

	Data for 1986–87 to 1993–94	*Basecase for 1997–98 to 2009–10*
Macro variables		
Real GDP	2.7	3.4
Real investment	0.7	4.0
Real consumption	3.1	3.2
Employment	1.4	2.3
Real wages (post-tax)	0.9	0.9
Exports	7.2	7.2
Imports	6.8	6.7
Price of imports[a]	1.4	3.1
Motor vehicles and parts		
Sales on domestic market (domestic and imported)	4.0	3.9
Domestic sales on domestic market	1.6	1.7
Imports	7.3	5.7
Domestic output	2.0	2.5
Exports	6.1	6.3
Price of domestic product (ex-factory)	3.1	2.9
Price of imports ($A, duty-paid)	2.9	2.5
Price of imports[a]	3.8	3.1

a Prices in $A, CIF, landed duty free.
Source: MONASH basecase simulation.

Over the period 1997–98 to 2009–10, real GDP is assumed to grow at an average annual rate of 3.4 per cent. This is based on an annual growth in aggregate employment and capital of around 2 per cent and a growth in productivity of around 1.5 per cent. This rate of growth in GDP is higher than that for the historical period (1986–87 to 1993–94).[2]

The composition of GDP is assumed to change, with investment increasing its share of GDP, mainly at the expense of government expenditure.[3] Exports and imports are also assumed to grow faster than GDP.

2 See Appendix M.

3 Investment was low in 1993–94 compared to 1986–87, reflecting different stages in the business cycle.

Despite the higher rate of growth and the change in the composition of GDP (compared to the period 1986–87 to 1993–94), the rate of growth in output of the automotive industry is conservatively assumed to be close to the historical growth rate (2.5 per cent). This is primarily explained by offsetting changes in other factors described in the following paragraphs.

The historical analysis (Appendix M) suggests that technological change has favoured the use of motor vehicles as intermediate goods. It also suggests that taste changes have favoured imported vehicles (partly reflecting a reduction in the range of models available from domestic producers as they restructure to take advantage of economies of scale and the increased availability of a wider range of models following the abolition of import quotas).

Both of these trends are assumed to continue in the basecase, but at reduced rates. The reduction in the rate of technological change favouring the use of motor vehicles reduces the rate of growth of output in the automotive industry by about 1.5 percentage points. Simultaneously, the reduction of the rate of change in taste favouring imported motor vehicles adds about 0.5 percentage point to the growth in output.

Because the rate of appreciation of the Japanese Yen is assumed to be less in the basecase than it was in the historical period, the average CIF prices of imported automotive products are expected to increase less rapidly. This reduces the rate of growth of output in the Australian automotive industry by about 0.5 percentage points.

Finally, about 1 percentage point is added to the rate of growth in output of the automotive industry by the assumption that investment (which is a heavy user of motor vehicles) will grow more rapidly in the basecase than it did in the historical period.

To put the basecase into perspective, the sales structure for the automotive industry for three points in time are provided (see Table N.2). As a result of the Commission’s conservative assumptions, even though the Australian automotive industry grows, by 2009–10 the share of domestic production in Australian automotive sales has decreased to 38 per cent.

Table N.2: **Shares of total domestic sales of automotive products, various years**

	1986–87	*1996–97*	*2009–10*
Domestic products			
Intermediate use	0.23	0.22	0.10
Investment use	0.25	0.17	0.18
Consumption	0.15	0.16	0.10
Imported product			
Intermediate use	0.17	0.23	0.23
Investment use	0.14	0.13	0.27
Consumption	0.07	0.10	0.12
Total	**1.00**	**1.00**	**1.00**
Share of domestic output exported	0.05	0.06	0.06

Source: MONASH basecase simulation.

Changes in the annual rates of growth for other industries under the basecase are shown in Table N.3. They reflect the set of assumptions made on changes in productivity, tastes, and macroeconomic and commodity-specific forecasts. Communications and Finance services are the fastest growing sectors. Other sectors with high rates of growth such as Other machinery, Transport, Chemicals and Mining are related to high growth in investment and exports. The sectors that grow slowly are Public administration, Wood products and Textiles, clothing and footwear. These have relatively high labour costs and less opportunity to reduce their costs through productivity improvements.

Table N.3: **Rate of growth of broad sectors in the basecase, 1997–98 to 2009–10** (average annual per cent changes)

		per cent
1	Agriculture, forestry and fishing	2.7
2	Mining	4.6
3	Food, beverages and tobacco	3.3
4	Textiles, clothing and footwear	0.8
5	Wood, wood products and furniture	2.1
6	Paper, paper products, printing and publishing	3.3
7	Chemicals, petroleum and coal products	4.8
8	Non-metallic mineral products	2.3
9	Metal products	4.2
10	Transport equipment	2.9
11	Other machinery and equipment	6.6
12	Miscellaneous manufacturing	3.6
13	Electricity, gas and water	3.6
14	Construction	2.7
15	Wholesale and retail trade	3.2
16	Transport and storage	4.7
17	Communication	7.6
18	Finance, property and business services	6.4
19	Ownership of dwellings	2.6
20	Public administration and defence	1.7
21	Community services	3.1
22	Recreation, personal and other services	4.2

Source: MONASH basecase simulation.

N.3 Scenarios

To evaluate the economy-wide effects, four scenarios are simulated over the period 1997–98 to 2009–10. These are outlined in Table N.4. The scenarios are based on two schedules to reduce the tariff and two assumptions about the market structure of the automotive industry.

Table N.4: **Combinations of tariff changes and automotive industry structure in scenarios modelled**

	Automotive industry market structure	
Tariff schedule	*Constant returns to scale and perfect competition*	*Economies of scale, imperfect competition and product differentiation*
Reduce tariff to 5 per cent by 2004–05	Scenario A	Scenario B
Reduce tariff to 5 per cent by 2009–10	Scenario C	Scenario D

N.3.1 Tariff schedules

The tariff schedules on automotive imports are summarised in Table N.5.

Table N.5: **Tariff schedules assumed for motor vehicle imports[a], 1997 to 2010** (per cent)

	Basecase	*Scenarios A and B*	*Scenarios C and D*
1997	22.5	22.5	22.5
1998	20.0	20.0	20.0
1999	17.5	17.5	17.5
2000	15.0	15.0	15.0
2001	15.0	12.5	14.0
2002	15.0	10.0	13.0
2003	15.0	7.5	12.0
2004	15.0	5.0	11.0
2005	15.0	5.0	10.0
2006	15.0	5.0	9.0
2007	15.0	5.0	8.0
2008	15.0	5.0	7.0
2009	15.0	5.0	6.0
2010	15.0	5.0	5.0

a Tariff rates apply to FOB value of imports; the ratio of FOB to CIF values is about 0.85. Rates applying on 1 January of each year.

Although the table refers to the tariff on motor vehicles, changes in the assistance to all parts of the motor vehicle industry are taken into account (see Box N.1 for details).

The four scenarios are evaluated relative to the basecase. In the basecase, the tariff is reduced to 15 per cent by 2000–01. After that, the tariff is maintained at that level for the remainder of the simulation period.

In scenarios A and B, the tariff is reduced to 15 per cent by 2000–01, as in the basecase. Beyond this year, the tariff rates above 5 per cent are reduced by 2.5 percentage points per year until they reach the level of 5 per cent (in 2004–05). They are then held constant at this level for the rest of the simulation period.

Scenarios C and D also follow the basecase until 2000–01. After that year, the tariff rates are reduced by 1 percentage point per year so that they are 5 per cent by the year 2009–10.

Box N.1: **The motor vehicle tariff**

Motor vehicle imports can be divided into three groups, shown in the table below. The tariff rates vary, depending upon the type of product and the purpose for which it is imported. In particular, components used by the automotive industry attract a higher rate than do components destined for after-market sales. The motor vehicle group in the MONASH model has not been disaggregated. The tariff rate for the aggregate group is an average of the rates applying to each sub group, with each rate weighted by its share of the value of imports.

Tariff structure for automotive imports, by user, 1997[a] (per cent)

Commodity	*Automotive industry*	*Other industries*	*Consumption*	*Investment*
Passenger vehicles	22.5	22.5	22.5	22.5
Components	22.5	15.0	15.0	NA
Other vehicles	5.0	5.0	5.0	5.0

NA Not applicable
a Rates applying on 1 January 1997.
Source: Based on Australian Customs Service (1996).

The effect of the 15 per cent duty free entitlement and the export facilitation scheme (EFS) depend on the tariff rate. The EFS scheme is assumed to cease in 2000–01 and therefore does not interact with the tariff reduction considered. Beyond the year 2000–01, the duty free entitlement reduces the cost of inputs used by the automotive industry and is modelled as a subsidy, to follow changes in the tariff. See Appendix P for further discussion of the treatment of the tariff.

N.3.2 Market structure

The gains from reducing the automotive tariff are sensitive to the market structure of the industry. The gains can be significantly larger when reducing tariffs in an industry that has economies of scale, product differentiation and imperfect competition compared to one which has constant returns to scale, perfect competition and undifferentiated products.

The Commission considers that in the motor vehicle industry, the assumptions of perfect competition, constant returns to scale and undifferentiated products (that is, all cars are the same) are too conservative. The Commission believes, as does the industry, that there are economies of scale in the industry and that motor vehicles are differentiated products.

As noted in Chapter 3, economies of scale in the industry arise from the high fixed costs associated with product development, tooling and plant equipment. Economies of scope also arise when facilities in an assembly plant to produce a number of different models.

According to Holden (sub. 19), in order to achieve economies of scale output needs to exceed around 150 000 vehicles per annum. Holden also points out that it is important to have a consistently high rate of capacity utilisation. Holden is planning to lower its unit cost of production in its Elizabeth assembly plant by adding another car line. This is expected to raise output to around 150 000 units, and lower Holden's overall cost of production. In Australia, the production volume for various models is typically in the order of 40 000 to 110 000 (see Appendix B).

Increasing the level of production of individual product lines can lower the average cost of manufacturing a motor vehicle. However, to achieve economies of scale under current technologies, the range of vehicles manufactured in Australia may need to be reduced or the number of firms producing these models may need to fall. The increase in volume would allow the remaining producers to lower their costs and maintain competitiveness with imports.

Table 3.2, in Chapter 3, illustrates how motor vehicles can be differentiated into market segments. However, these market segments are not independent of each other. If the price of motor vehicles in one segment changes relative to prices in another, or one of the models ceases to be supplied, it would be expected that some consumers would redirect their purchases to other models or market segments.

Product differentiation arises because consumers have a diverse range of preferences and incomes. Motor vehicles are highly differentiated on characteristics such as reliability, fuel economy, speed and acceleration, passenger capacity, passenger comfort, prestige and quality, and specialised servicing provided by suppliers. The motor vehicle industry tries to differentiate its products through advertising, periodic model changes and providing for different combinations of features.

As the tariff is reduced, and the price of imported cars decreases, domestic producers may respond in several ways. One response is not to decrease their prices and therefore to lose market share — the loss of market share for each domestic model being dependent upon its degree of substitutability with imported models.

Alternatively, firms could lower prices to try and retain market share. The ability to do this and remain profitable depends upon the initial level of profitability and cost of production and the ability to reduce the cost of production through productivity improvements.

Under either of these alternatives, bearing in mind that Australian producers are each operating at different levels of efficiency, one of the firms may become uneconomic and exit the industry if it cannot make up volume through increased exports.

However, some of the company’s customers may switch to another Australian-made car. The resultant increased demand for other Australian-made vehicles may enable the firms producing them to take advantage of economies of scale. Further, the firm could decide to add a new line and produce an additional model, taking advantage of economies of scope.

Reducing the tariff increases the pressure on firms to increase volume in order to exploit economies of scale, so that they can compete against the relatively cheaper imports. It also increases pressure for firms to lower costs through productivity improvements.

In the situation described above, the Australian economy gains from the improvement in the cost efficiency of the automotive industry, even though the automotive industry still loses domestic market share.

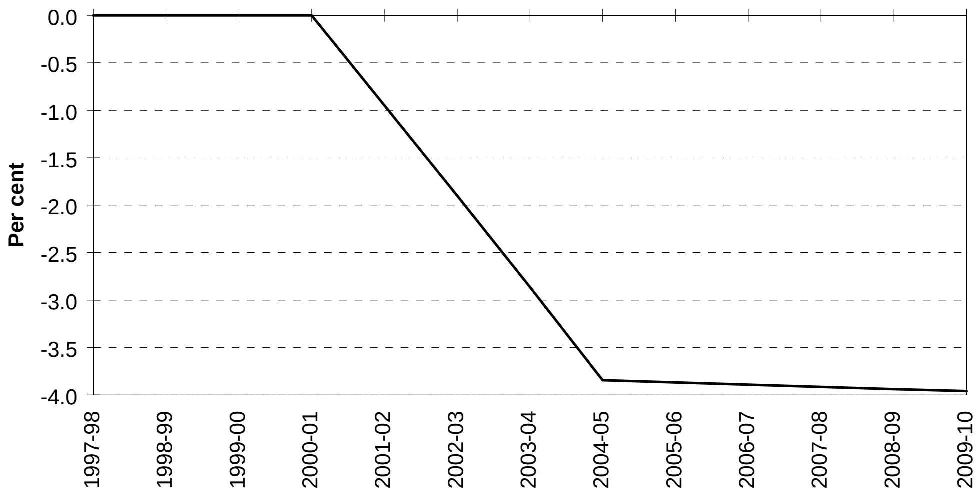
This is probably part of the explanation of what has been happening in the automotive industry as it adjusted to recent tariff changes and the Button car plan. Not all of the increase in imports can be attributed to reductions in the price of imported cars relative to Australian-made cars. Some of the loss of domestic market share may have been due to the reduction in the range of cars manufactured in Australia. This was identified in the historical analysis, described in Appendix M as a shift in preferences towards imported cars that was not explained by relative changes in price.

N.3.3 Modelling scale economies and imperfect competition

The assumption used in the economies of scale case is that the output of Australian producers is the same as for the constant returns to scale scenarios. That is, output decreases over time relative to the basecase. However, the reason for the decrease in output and loss of market share is not attributed to a decrease in the price of imported cars relative to that for Australian-made cars. Rather, it is attributed to a reduction in the range of products manufactured in Australia and is modelled as a shift in consumption towards imported cars.

The unit cost of production is assumed to decrease — as a result of greater achievement of economies of scale and some productivity improvements — to match the reduction in the price of imported cars arising from reductions in the tariff. This is modelled as a reduction in the cost of production, whereby the use of labour, capital and intermediate inputs are reduced. The change in the cost of production is shown in Figure N.1. A reduction of 3.9 per cent in the unit cost of production by 2004–05 is factored in.[4]

Figure N.1: **Reductions in production costs resulting from economies of scale in the motor vehicle and parts industry, 1997–98 to 2009–10** (per cent deviations of Scenario B from basecase)



Source: MONASH simulations.

N.4 Results for scenarios A and B

In analysing the scenarios, the following assumptions should be borne in mind:

- The effect on aggregate employment is assumed to be negligible in the long run. Any tendency for the tariff reductions to increase (or reduce) aggregate employment is offset by an increase (or decrease) in real wage rates.[5] However, wages are assumed to adjust sluggishly so that the additional tariff reductions can affect employment in the short run.

[4] After allowing for the difference in CIF and FOB prices, and some averaging of tariff rates, the basic price of imported motor vehicles decreases by around 7 per cent by 2004–05. The industry itself benefits from tariff reductions, with a decrease in cost of production of around 2.5 per cent. There is a further small decrease in the cost of production arising from the multiplier effects from the use of motor vehicles as an intermediate good to itself. This leaves a residual cost differential of 3.9 per cent.

[5] This is consistent with the modern practice in macroeconomic modelling of a constant NAIRU, but gains would be larger if real wage increases were slightly lower and there was some increase in employment. See Appendix O.

- The tariff reductions have no effect on rates of return on capital in the long run. Any tendency for the tariff reductions to increase or reduce rates of return is offset by increases or decreases in capital stocks. However, because it takes time for new capital to be built and for existing capital to depreciate, rates of return can vary in the short run.
- The direct and indirect effects of the tariff reductions on government revenue are neutralised by increases in income tax rates.[6]
- Any change in the incomes of Australians generated by the reductions in tariff is entirely absorbed by a change in their consumption. This implies that the tariff reductions generate no change in saving by Australians. Hence, any change in investment must be financed by foreigners. This allows the change in real consumption generated by the tariff cuts to be used as an indicator of the change in the *economic welfare* of Australians.

N.4.1 Comparison of economy-wide gains for scenarios A and B

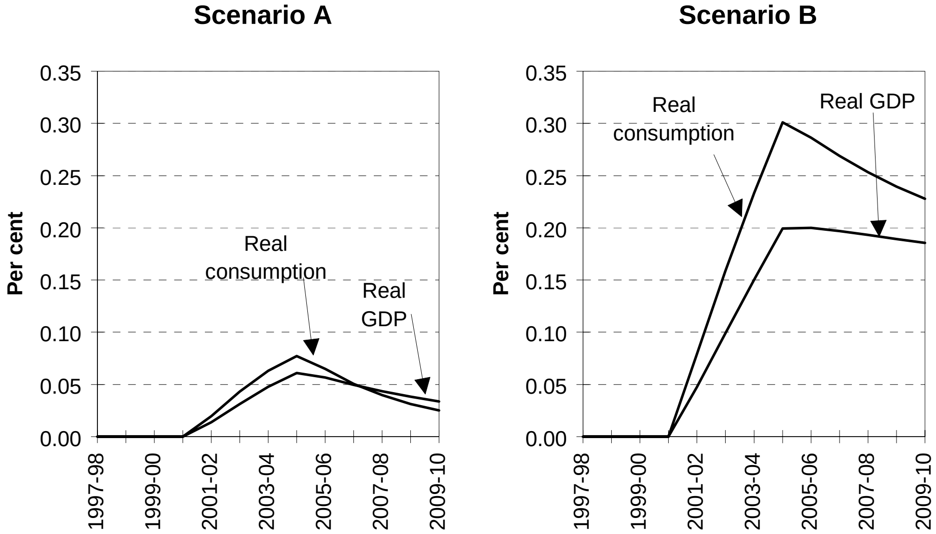
The paths for the gains in real GDP and aggregate real consumption under scenarios A and B are shown in Figure N.2. The long-term gains for both indicators vary significantly between the scenarios, but the paths over time are similar.

By the year 2009–10, the increase in GDP (compared to the basecase) under the conservative scenario A is 0.034 per cent (representing $165 million in terms of real GDP in 1995–96) and 0.185 per cent ($904 million) for scenario B. Real aggregate consumption increases by 0.025 per cent ($76 million) in scenario A and 0.228 per cent ($689 million) in scenario B.

The explanations for the path over time and the source of the increase in GDP and consumption are discussed in the following section.

6 See Appendix P for further discussion.

Figure N.2: **Changes in GDP and consumption, scenarios A and B, 1997–98 to 2009–10**
(per cent deviations from basecase)



Source: MONASH simulations.

N.4.2 Source of the increase in GDP

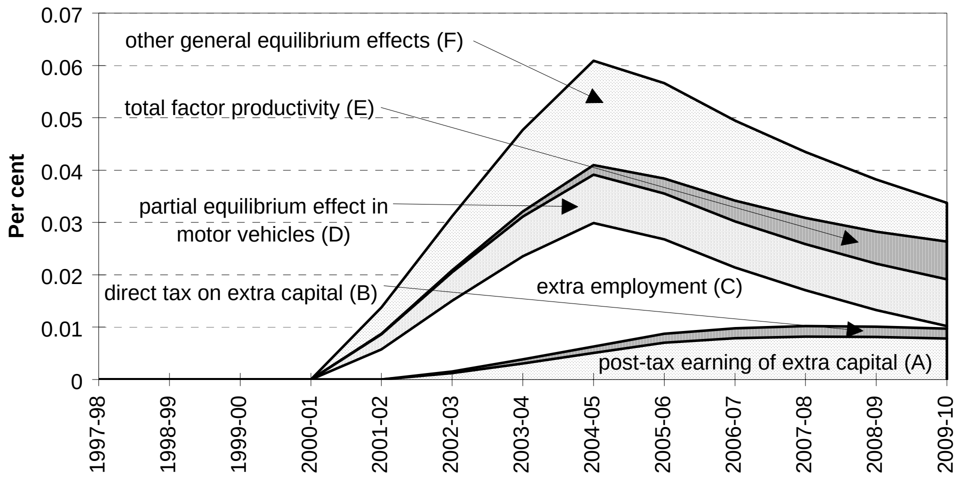
Scenario A

In scenario A, the addition to real GDP, over and above the basecase, is shown by the top line in Figure N.3. The figure also shows that the deviation in the values of real GDP between scenario A and the basecase can be divided into a number of components.

The first factor contributing to the growth of GDP is growth in the capital stock. In the long run the capital stock increases because reductions in the tariff on automotive products increase wage rates relative to capital rental rates.

One reason for this is that automotive products are important inputs to capital formation. Reductions in prices generated by tariff cuts reduce the cost of capital. Another reason is that the assumptions that rates of return and the level of employment are unaffected by the tariff cuts in the long run. This implies that the efficiency benefits flowing from the tariff cuts are eventually taken as increases in real wage rates. This increase in the relative cost of labour encourages the use of capital.

Figure N.3: **Contributions to changes in real GDP for scenario A, 1997–98 to 2009–10** (per cent deviations from basecase)



Source: MONASH simulation.

The earnings of additional capital (including income taxes) account for 0.01 percentage points of the 0.034 per cent deviation between scenario A and basecase value of real GDP. Of the 0.01 percentage points, 80 per cent is retained by the foreign owners of the additional capital (area A in Figure N.3) and 20 per cent is paid in direct taxes (area B).

Additional employment also contributes to the growth in real GDP (area C in Figure N.3). Immediately after the tariff cuts the employment contribution is quite large. However, by 2009–10 it has largely been eroded by increases in wages because of the labour market assumptions in the model. Any relaxation of the assumption that tariff reductions cannot increase employment in the long run would increase the gains, as illustrated by the short-term employment gains.

The allocative efficiency gain identified in the conventional partial equilibrium analysis of protection is shown by area D of Figure N.3. By 2009–10 it contributes 0.009 percentage points of the 0.034 per cent deviation between the scenario A and the basecase value of real GDP. This is the gain resulting directly from the switch of domestic resources away from the production of automotive products and into the production of commodities with higher values at world prices.

The *total factor productivity* contribution (area E in Figure N.3) arises because, in all the scenarios, it is assumed that technological change will favour the use of motor vehicles and allow reductions in the use of other inputs. This technological change is extrapolated from recent historical experience (see Appendix M). The additional tariff cuts in scenario A reduce the share of motor vehicles in industries' total costs. This decreases the significance of the automotive product-using technological change relative to the input-saving technological changes which are assumed to accompany it. Hence, the economy's average rate of total factor productivity growth is increased. In 2009–10, this contributes about 0.007 percentage points of the 0.034 per cent deviation between scenario A and the basecase value of real GDP.

The final component of the growth in real GDP, identified in Figure N.3 (area F), is the increase in indirect taxes (other than the tariff on automotive products). These accrue because stimulation of the economy expands the indirect tax base. In the presence of indirect taxes, additional factors (labour and capital) produce goods for which the market value exceeds the factor cost (that is, the returns to the additional labour and capital including direct taxes).[7]

The additional factors used in the projections of scenario A are mainly foreign-owned capital. Owners of foreign capital receive a smaller share of the income tax cuts than they contribute to the indirect tax increase. Hence, the benefits of this last effect accrue mainly to domestic consumers. In 2009–10 this component contributes 0.007 percentage points of the 0.034 per cent deviation between the scenario A and the basecase value of real GDP.

Figure N.3 shows the effect of the post 2000 tariff cuts on real GDP. But what is their implication for the economic welfare of Australians? All the components of the increase in real GDP except the post tax earnings of the extra capital (area A in Figure N.3) accrue to domestic residents. In total these amount to approximately 0.026 per cent of GDP in 2010. To measure its welfare significance, this increase in Australians' incomes is translated into the increase in real consumption which it allows.

The first step in the conversion from income gain to consumption gain is to note that some of the income gain is lost in a terms-of-trade deterioration.[8] As part of the economic expansion generated by the tariff cuts, export volumes expand.

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7 Because of the assumption of revenue neutrality, this increase in indirect taxes is assumed to be used to reduce income tax rates, dampening the impact of the loss of tariff revenue.

8 The possibility of a deterioration in the terms of trade constitutes part of the conservative assumptions made by the Commission. Relaxing this assumption would result in larger real consumption gains than reported in this appendix.

This leads to a fall in the world prices of some exported commodities, notably wool.

In 2009–10 the terms of trade loss generated by the post-2000 tariff cuts in scenario A is enough to reduce the purchasing power of GDP by about 0.014 per cent. Therefore, the increase in Australians' incomes of 0.026 per cent of GDP translates into an increase in their purchasing power of only about 0.012 per cent of GDP. Because consumption accounts for about 60 per cent of GDP by 2009–10, this calculation shows that an increase in consumption worth 0.012 per cent of GDP is approximately equivalent to a 0.02 per cent increase in real consumption (other factors accounted for in the model yield a 0.025 per cent increase in real consumption).

Scenario B

Under scenario B, the overall increase in GDP is around 0.18 per cent by 2009–10, more than five times larger than for scenario A. The GDP gains and their components, are shown in Figure N.4.

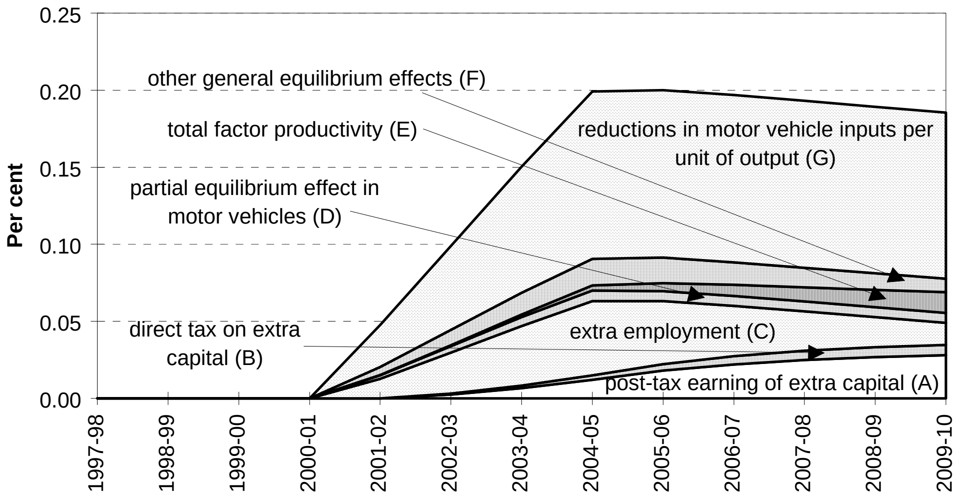
The automotive industry represents around 2.5 per cent of GDP. An improvement in cost efficiency of 3.9 per cent represents a gain in GDP of around 0.1 per cent above that in scenario A. This new source of gain is shown by area G in Figure N.4.

The increase in the use of capital in the economy is greater than in scenario A. This is because the relative price of capital decreases from the reduction in the cost of motor vehicles. On the other hand, the contribution of the partial equilibrium effect (the so-called Harberger triangles) is reduced. This effect is proportional to the growth of automotive imports. The improvement in cost efficiency in the automotive industry reduces automotive import growth by reducing the industry's demand for imported components.

Summary

In summary, the decomposition presented in this section shows that partial equilibrium analysis is inadequate in assessing the GDP and welfare effects of tariff changes in the presence of other distortions in the economy. Partial equilibrium analysis overlooks the additional use of primary factors and the implications of the domestic economy's taxation of foreign capital. In the projections of the conservative scenario A, the partial equilibrium effects account for less than a third of the long-run increase in GDP and less than one half of the long-run increase in real consumption.

Figure N.4: **Contributions to changes in real GDP, scenario B, 1997–98 to 2009–10**
(per cent deviations from basecase)



Source: MONASH simulations.

N.4.3 Aggregate employment and wages

The aggregate effects of tariff changes on real wages (pre- and post-tax) and employment are shown in Figure N.5. Initially, real wages are fixed and employment adjusts. As the tariff is reduced, activity in the economy and employment rise. Over time, pre- and post-tax real wages rise, so that in the long term there is assumed to be no increase in aggregate employment.[9] That is, employment returns to the level specified in the basecase.

As the tariff is reduced, income tax rates rise to maintain government revenue, widening the gap between pre- and post-tax wages. The increase in income tax beyond 2004–05 arises because automotive imports are increasing over time in the basecase. Hence, the tariff on automotive products are an increasing source of revenue in the basecase, and the additional revenue loss needs to be replaced as the tariff is lowered.

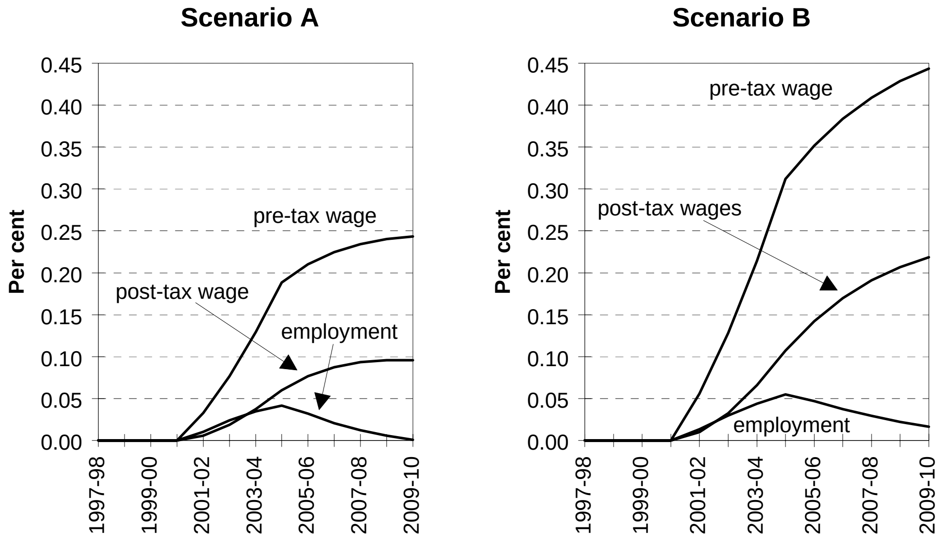
If the labour market had taken less of the gain in the form of real wages, then some of the employment gains achieved during the tariff reduction phase (2001–02 to 2004–05) would remain after 2005–06. The gains from reducing the tariff would therefore have been greater and the reduction in GDP after

9 See Appendix O for an exposition of the labour market mechanisms.

2005–06 would not have occurred. In this case, GDP gains would have been in the order of 0.06 per cent ($292 million in 1995–96 GDP), relative to the basecase.

In scenario B, the gains to the economy are much larger than in scenario A because of the cost efficiencies arising from economies of scale. These larger gains are captured as larger increases in real wages. The short term increase in employment is slightly larger than in scenario A. By 2009–10, the short-term increase in employment has not yet disappeared. This is because the relatively larger increase in real wages induces a greater substitution towards capital. However, the increase in capital takes time to occur and by 2009–10 this process has not yet been completed.

Figure N.5: **Changes in real wage rates and aggregate employment, scenarios A and B, 1997–98 to 2009–10** (per cent deviations from basecase)



Source: MONASH simulations.

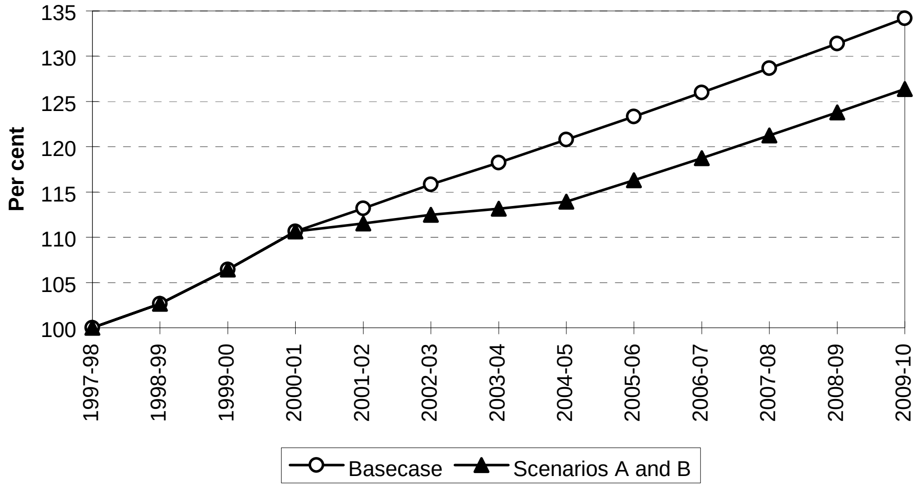
N.4.4 Impact on the automotive industry

The impacts on output in the automotive industry are shown in Figure N.6. The basecase reflects an average annual growth of 2.5 per cent.[10] The growth in

[10] Aggregate growth is strongest in the early years of the simulation period (up to 2002–03). In the later part, all components of GDP are assumed to grow about 3 per cent per year. This combination of factors counteracts the effect of reducing the tariff from 1997 to the

output is the same for scenarios A and B, because scenario B assumes that the output of the domestic industry is the same as for scenario A. However, its explanation is different. In scenario B, it is attributed to a shift in preference towards imports, rather than lower relative prices for imports.

Figure N.6: **Real automotive output, basecase, scenarios A and B, 1997–98 to 2009–10** (1997–98 = 100)



Source: MONASH simulations.

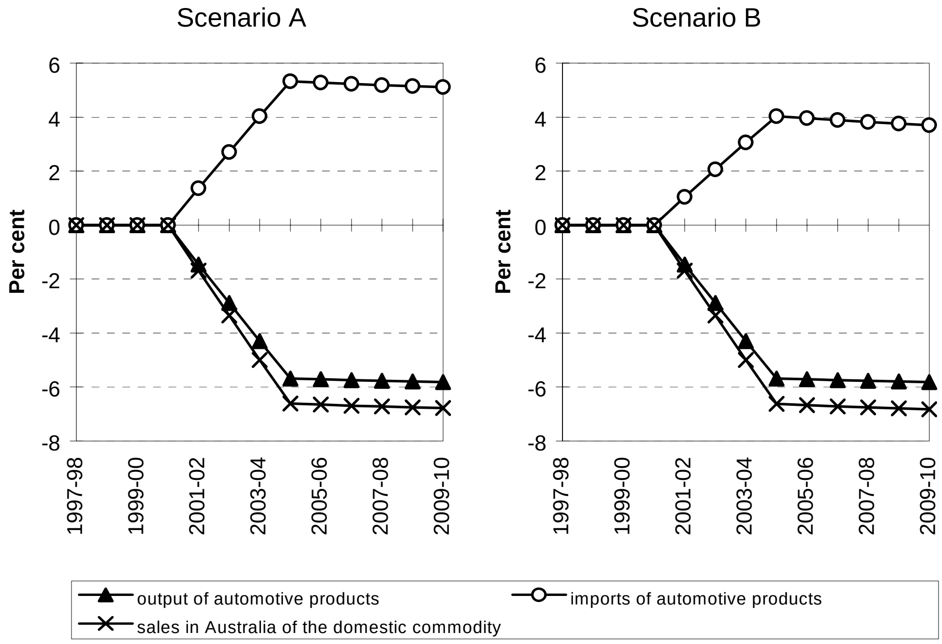
Figure N.7 helps to explain the output results. It shows that in scenario A, imports gain share in the sales of motor vehicles in the Australian market and that Australian producers lose share. This is because tariff reductions reduce the price of imports relative to the price of domestically produced vehicles. The growth in total sales in the domestic market is about 1 per cent below basecase growth because intermediate goods used by the industry include automotive parts. Therefore, a lower rate of growth in the use of motor vehicles as an intermediate good contributes to a decrease in the rate of growth of the industry as a whole.

The growth in the output of the Australian industry is higher than the growth in its sales in Australia (compared to the basecase) because the growth in exports of motor vehicles is not reduced by the tariff cuts.

year 2000, resulting in relatively little change in the growth of automotive output over the entire period 1997–98 to 2009–10.

In scenario B, the sales of motor vehicles in Australia are slightly less than in scenario A because of the assumed improvement in the use of inputs, including more efficient use of motor vehicles as an intermediate good. The output of the domestic industry is the same as in scenario A, by assumption. This results in a small increase in domestic market share of Australian producers compared to scenario A and explains why there is a smaller increase in imports for scenario B.

Figure N.7: **Output, imports and sales of automotive products, scenarios A and B, 1997–98 to 2009–10**
(per cent deviations from basecase)



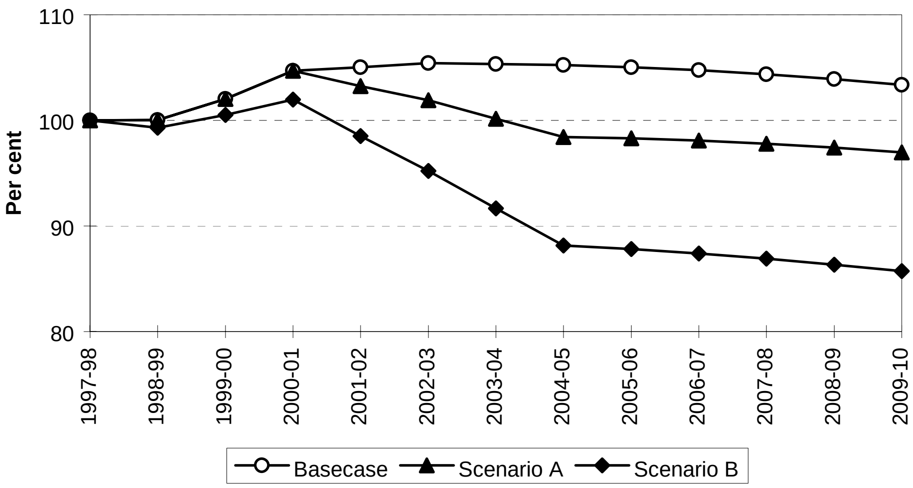
Source: MONASH simulations.

The impact on employment in the automotive industry is shown in Figure N.8. There is an underlying trend of improving labour productivity reflected in the basecase level of employment. In spite of the 34.2 per cent growth in output of the industry between 1997–98 and 2009–10, employment increases by only 3.4 per cent.

In comparison to the basecase, reductions in the tariff reduce the growth in output sufficiently to generate an overall reduction in employment by 2009–10. By this time, employment in the industry in scenario A is 6 per cent (3905 persons) less than in the basecase for that year, or 3 per cent (1882 persons) less than in 1997–98.[11]

The reduction in the size of the workforce in scenario A does not indicate a significant structural adjustment issue. Employment is growing generally in all States and there is a high rate of turnover of employees in this industry.

Figure N.8: **Employment in the automotive industry, basecase, scenarios A and B, 1997–98 to 2009–10**
(per cent of 1997–98 employment)



Source: MONASH simulations.

In scenario B, the decrease in employment is larger because of the assumption of economies of scale and productivity improvements — which mean fewer workers are required per unit of capital.

By 2009–10, employment is 10 per cent (6289 persons) lower than the basecase. This level of employment represents a decrease of 7 per cent (4267 persons) compared to that in 1997–98. Again, this decrease in employment is partly

[11] Note that the employment estimates for 1997–98 incorporated in the model are larger than the current employment estimates given in Chapter 3. This is because the figures used by CoPS were based on ABS *Manufacturing Industry Survey* data from 1992–93, and included the entire sector of Motor vehicle and part manufacturing (281). The figures given in Chapter 3 are from ABS *Manufacturing Industry Survey* data from 1994–95, and exclude Motor vehicle body manufacturing (2812) because this covers the production of trailers, caravans and truck bodies.

offset by the employment increase in the industry arising from economic growth.

The possible regional effects of the reduction in employment in scenario B are discussed below in the State employment effects.

N.4.5 Impacts on other industries

Reducing the tariff results in structural change of the economy. The industries that gain from tariff reduction fall into four categories (Figure N.9):

- traditional export industries with low labour shares in their costs, and related industries;
- manufacturing industries with large export shares in their sales;
- industries whose products are used mainly in capital creation; and
- industries with a particularly heavy reliance on automotive products as inputs.

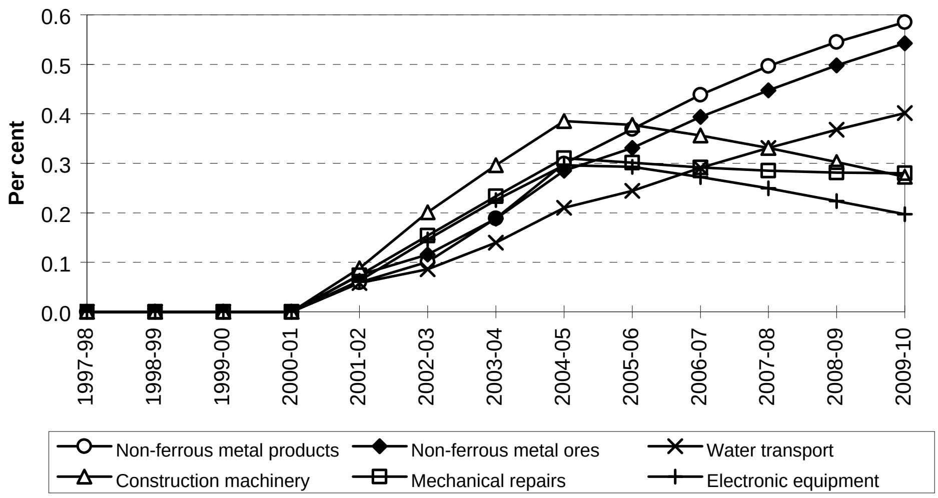
Mining industries (such as Non-ferrous metal ores) are in the first category. They are capital intensive and benefit from the real exchange-rate devaluation which is a result of the tariff reductions. Further, because they are not labour intensive, they are not significantly penalised by rising wages. The activity of the main industry used in transporting the new exports (Water transport) also increases as the volume of exports increases.

The second category includes processed primary products and selected manufacturing industries with higher labour content than in the first category. These industries’ outputs rise rapidly as exports are stimulated by the real devaluation. After 2005, the rate of real devaluation in scenario A eases. In the later years the negative effect on the export performance of these industries of increasing real wage rates outweighs the positive effect of the preceding real devaluation.

The output of industries in the third category is affected by the increase in investment which was stimulated by the tariff cuts. In addition, these industries are affected by the same type of factors as those in the second category because a significant part of their output is destined for exports. These industries include Construction machinery and Electrical equipment.

The costs of the Mechanical repairs industry are influenced heavily by the prices of after-market components. As the price of components fall with tariff cuts so do the costs of mechanical repairs. The repairs industry increases its activity, benefiting from consumers' ability to afford higher levels of maintenance for their vehicles.

Figure N.9: **Output of a sample of industries that benefit from tariff reductions in scenario A, 1997–98 to 2009–10** (per cent deviations from basecase)

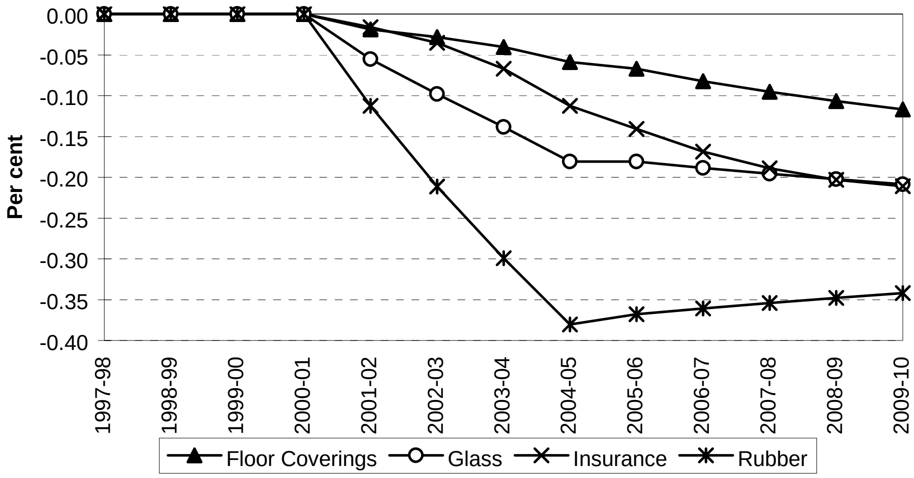


Source: MONASH simulations.

Industries that are heavily dependent on sales to the motor vehicle industry and do not have a large export share in their sales are negatively affected in scenario A (Figure N.10). For the rubber industry, output is 0.34 per cent below its basecase level and for the glass industry, it is 0.21 per cent lower.

The output of industries whose output is largely directed toward private consumption falls relative to the basecase. Examples of these industries are Insurance and Floor covering (approximately 50 per cent to private consumption). Lower prices for automotive products encourage their consumption and increases the share of automotive products in Australians' budgets. Other items in the budget are displaced by this increased expenditure on automotive products.

Figure N.10: **Output of a sample of industries that are adversely affected by tariff reductions in scenario A, 1997–98 to 2009–10** (per cent deviations from basecase)



Source: MONASH simulations.

N.4.5 State employment effects

The analysis in this section concentrates on the regional employment effects of reducing the tariff. In scenario A, it is assumed that employment in the automotive industry is reduced by the same proportion in all States.[12] The State employment outcomes depend on the relative importance of employment in the automotive industry and associated industries (local multiplier effect). The structure of employment in the State economies at the start of the simulation period is summarised in Table N.6.[13]

Western Australia (WA) and the Northern Territory (NT) have comparatively large mining industries geared towards exports and negligible employment in the automotive sector. The growth of employment for these States in scenario A is above that in the basecase (Figure N.11).

[12] See Appendix O for a more detailed exposition of assumptions underlying the regional results.

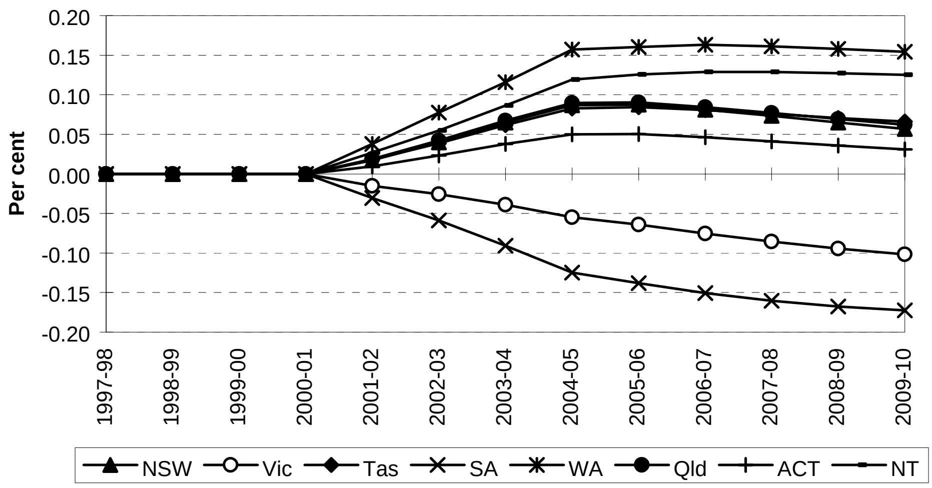
[13] These shares are obtained by using the MONASH model to update the database from 1993–94 to 1996–97.

Table N.6: **Shares of sectoral employment in State employment, 1997–98[a]** (per cent)

	Primary industries	*Manufacturing (incl. automotive)*	*Services*
New South Wales	3	12	86
Victoria	2	14	84
Queensland	5	10	86
South Australia	3	11	86
Western Australia	7	8	85
Tasmania	5	7	88
Australian Capital Territory	..	2	98
Northern Territory	5	2	94
Australia	3	11	86

.. less than 0.005.
a At the start of the simulation period: 1 July 1997.
Source: MONASH database.

Figure N.11: **Employment changes by State, scenario A, 1997–98 to 2009–10** (per cent deviations from basecase)



Source: MONASH simulations.

Queensland (Qld), New South Wales (NSW), Tasmania and the Australian Capital Territory (ACT) have very small automotive sectors and relatively small (or no) employment in the mining sector. Employment in these States benefits from increased activity in other industries, which is due to reduced input costs. Although the growth under scenario A for these states is higher than in the basecase, it is not as strong as for WA and the NT because they do not have large mining sectors relative to the size of their economies.

The automotive sectors in the two main automotive-producing States, Victoria and South Australia (SA), account for relatively large shares of the manufacturing industry in these States.

The reduction in the growth of employment in these States consists of the direct employment losses in the automotive sector and losses in other industries which depend on the local economies (especially the services sector). However, in SA the expansion of some agricultural and associated industries contribute a counteracting increase in employment. In Victoria, expansion of manufactured exports contributes a partly offsetting increase in employment. Overall, however, the growth in employment in both States is lower than in the basecase.

The difference between the basecase and scenario A by 2009–10 is equivalent to about 1140 jobs in SA and 2100 jobs in Victoria (based on 1997 employment levels). Most of the employment changes occur over a period of four years and are small in the context of normal structural adjustment and takes place within the context of increases in employment due to economic growth.[14]

Against the reduction in the rate of growth in employment, consumers in SA and Victoria benefit from lower automotive prices and from lower prices of other goods, as does the rest of the Australian community.

In scenario B, economies of scale are achieved by the rationalisation of product lines. In the extreme case this may mean the exit of an assembly firm from the industry. This would result in a redistribution of output and employment between the two States in which the industry is primarily located.

The Commission is not in a position to express a view as to whether any firm may cease production, or the State in which this may occur. This is a matter for the market place to resolve. The productivity achievements of each firm and the nature of its products will affect its prospects. Therefore, the regional results are presented for two alternatives (B1 and B2).

In scenario B1, it is assumed that there is a reduction in the output of the motor vehicle industry in SA. It loses the equivalent of 10 per cent of the total employment in the industry to Victoria by 2004–05. This represents a reduction

[14] In 1993, about 360 600 workers (out of about 6 million employed) changed sectors of employment. This is based on a 10-sector aggregation of industries in which manufacturing represents one sector. A more detailed disaggregation would increase this number. An additional 741 200 persons found work in that year (ABS 1994b).

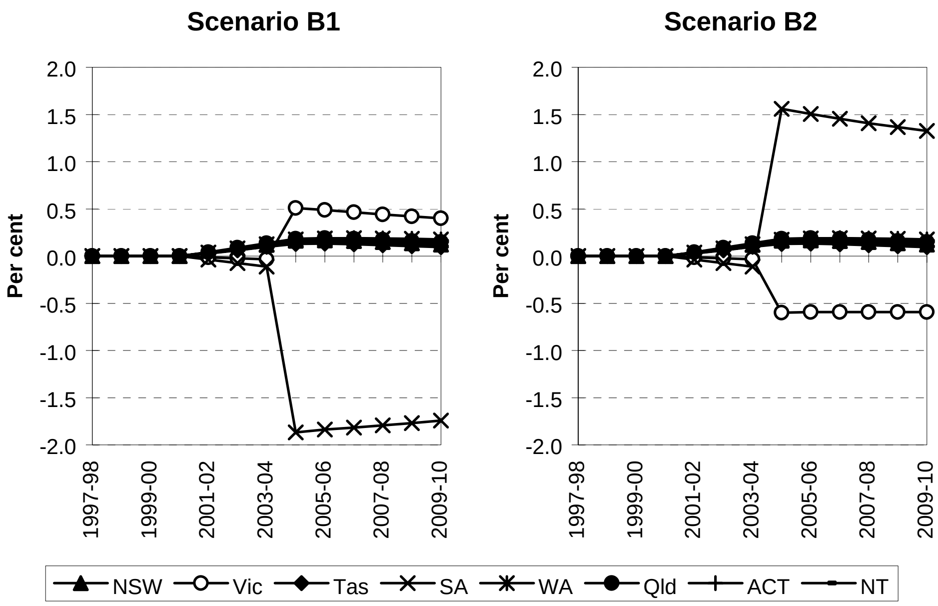
in employment in the SA automotive industry of 43.1 per cent and an increase in Victoria of 18.5 per cent.

In scenario B2, it is assumed that the reduction occurs in Victoria, so that there is an increase in employment in the SA automotive industry of 43.1 per cent and a decrease in Victoria of 18.5 per cent.

It should be noted that if a firm exits in one State, it does not necessarily result in an employment expansion occurring solely in the other State. The remaining firm in the first State may provide some offsetting increase in employment as it expands its output.

In scenario B1, total employment in SA decreases by just under 2 per cent relative to the basecase (Figure N.12), while Victoria has a net gain in employment. The increased concentration of the automotive industry in Victoria more than offsets the overall reduction in the size of the Australian automotive industry.

Figure N.12: **Employment by State and Territory, scenario B, 1997–98 to 2009–10**
(per cent deviations from basecase)



Source: MONASH simulations.

In scenario B2, the result is reversed, with a large increase in employment in SA. Because the automotive industry is a smaller share of the Victorian economy, the decrease in employment growth in Victoria is smaller than it was for SA for scenario B1. Conversely, employment growth in SA is larger than it was for Victoria in scenario B1, because the automotive sector is larger in the SA economy.

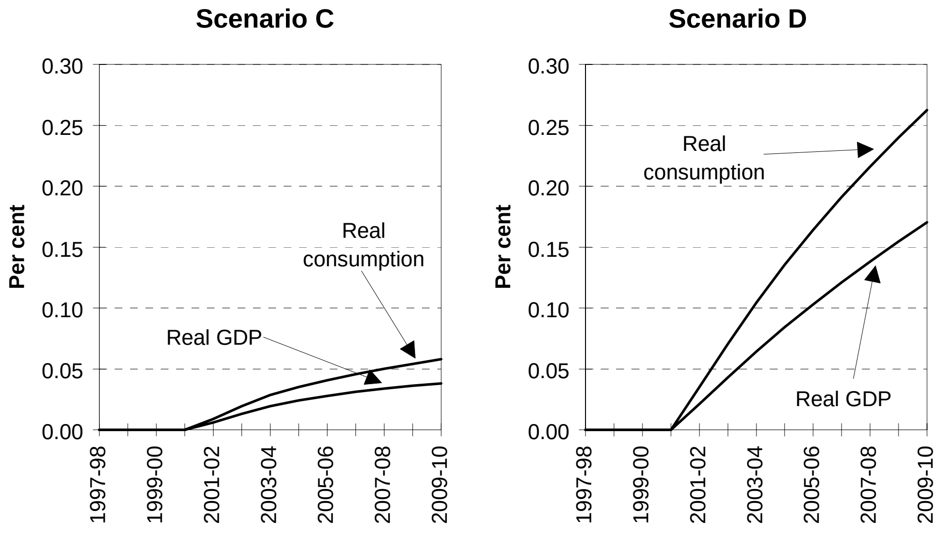
In scenarios B1 and B2, employment changes in the other States are assumed to be the same.

N.5 Results for scenarios C and D

Scenarios C and D only differ from A and B in that the tariff reductions are phased in more gradually. At the end of the study period real GDP and consumption (Figure N.13) are higher by comparison with scenarios A and B. This is because there has been insufficient time for real wages and the capital stock to adjust to the tariff reductions taking place up until the end of the study period.

The results for scenarios C and D are basically the first part of A and B stretched over a longer period. Over a longer study period, scenarios C and D would show a similar pattern to those of A and B.

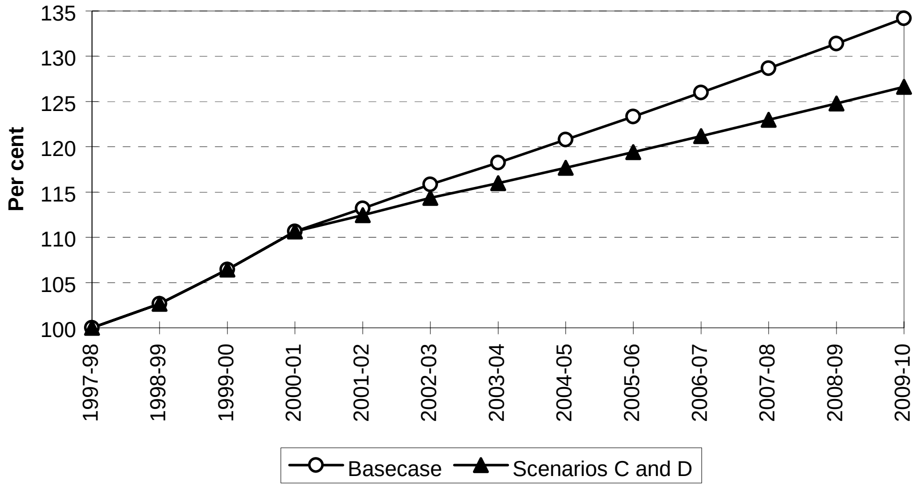
Figure N.13: **Changes in GDP and consumption, scenarios C and D, 1997–98 to 2009–10**
(per cent deviations from basecase)



Source: MONASH simulations.

The long-term impact on the output of the automotive industry under scenarios C and D is the same as for scenarios A and B (Figure N.14). However, the path of adjustment is steady compared to that for scenarios A and B.

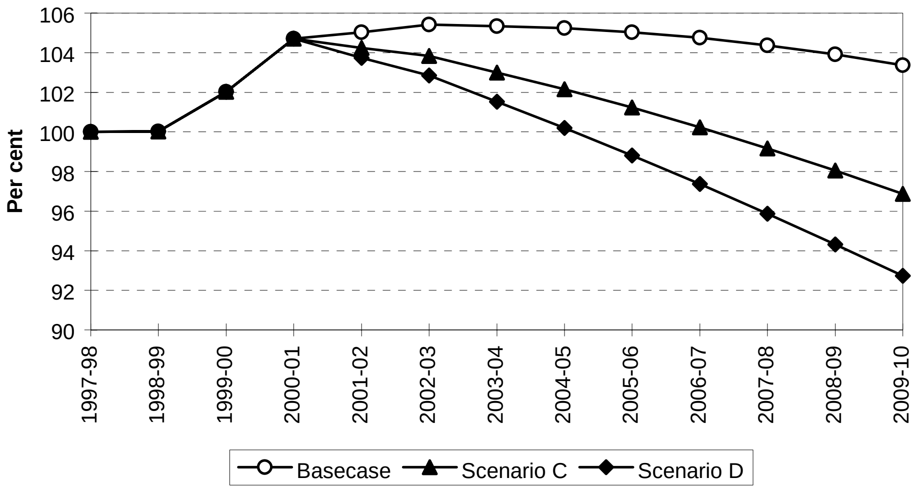
Figure N.14: **Real automotive output, basecase, scenarios C and D, 1997–98 to 2009–10** (1997–98 = 100)



Source: MONASH simulations.

In terms of employment in the automotive industry, by 2009–10 the decrease in scenarios C and D is less compared to that for scenarios A and B (Figure N.15). This is because real wages are still rising and it takes several years beyond 2009–10 before real wages stabilise and employment consistent with the wage levels is attained.

Figure N.15: **Employment in the automotive industry, basecase, scenarios C and D, 1997–98 to 2009–10**
(per cent of 1997–98 employment)



Source: MONASH simulations

N.6 Summary

The main results of the analysis are summarised in Tables N.7, N.8 and N.9. They show:

- the percentage deviation from the basecase for real GDP and real consumption in the year 2009–10;
- the dollar equivalent of these deviations from the basecase in 2009–10 (based on a proportion of GDP and consumption in 1995–96);
- the *present values* (brought to 1997) of the increases in real GDP and real consumption accumulated over the period 2001–02 to 2009–10.[15]
- an index of automotive output and employment in 2009–10; and
- increases in State employment between 1997–98 and 2009–10.

[15] Assuming a 5 per cent discount rate.

Table N.7: **Comparison of gains under all scenarios**

	Scenario A	*Scenario B*	*Scenario C*	*Scenario D*
Deviations from the basecase in 2009–10 *(per cent)*				
Real GDP	0.034	0.185	0.051	0.190
Real consumption	0.025	0.228	0.058	0.262
Dollar equivalents of deviations in 2009–10[a] *($ million)*				
Real GDP	165	904	246	926
Real consumption	76	689	175	793
Present values, brought to July 1997[b] *($ billion)*				
Real GDP	1.63	6.31	1.20	4.17
Real consumption	1.13	5.51	0.91	3.76

a Based on 1995–96 GDP and aggregate consumption.
b Using forecast real GDP and aggregate consumption, assuming 5 per cent discount rate.
Source: MONASH simulations.

Table N.8: **Index of automotive output and employment, basecase and all scenarios, 2009–10** (1997–98 = 100)

	Basecase	*Scenario A*	*Scenario B*	*Scenario C*	*Scenario D*
Automotive output	134	126	126	127	127
Automotive employment	103	97	93	97	93

Source: MONASH simulations.

Table N.9: **Employment increases by state, by scenario, 1997–98 to 2009–10** (per cent)

	A	*B1*	*B2*
New South Wales	26.9	27.0	27.0
Victoria	26.7	27.3	26.1
Queensland	26.9	27.0	27.0
South Australia	26.6	24.6	28.5
Western Australia	27.0	27.0	27.0
Other States and Territories[a]	27.0	27.0	27.0

a Tasmania, Australian Capital Territory and Northern Territory.
Source: MONASH simulations.

There are a number of findings.

- The long-term increase in real GDP is likely to be in the order of 0.034 to 0.185 per cent of GDP. Applied to real GDP in 1995–96, this would be equivalent to an increase of between $65 and $904 million by 2009–10. The present value of the gains between now and 2009–10 is around $1.6 to $6.3 billion dollars (in 1995–96 prices).
- Despite the loss of market share to imports, the automotive industry continues to grow, albeit at a slower rate. This is because of growth in the domestic economy and growth in exports of automotive products.
- Employment in the industry decreases between 3 and 7 per cent compared to the base case levels in 1997–98. In general, this is considered not to pose a specific structural adjustment problem. Employment in each State increases by around 26–27 per cent between 1997–98 and 2009–10.
- If there are economies of scale and productivity improvements by firms, the gains would be larger. However, there could be a larger short-term adjustment problem in one State or region because of a reduction in models produced or the exit of a firm.
- The Commission believes the smallest estimates of the gains reported here (scenario A) are an underestimate of the likely gains. The estimation assumes real wages rise, preventing any increase in employment in the long run. Further, there are no increases in productivity caused by reducing the tariff or from economies of scale. The short-term results for scenario A (where additional employment contributes to economy-wide gains) and the long-term results for scenario B (where no employment gains are left, but economies of scale and productivity improvements contribute to economy-wide gains) clearly demonstrate how sensitive the estimates of the gains are to small changes in these assumptions.

O THE MONASH MODEL

O.1 Introduction

Under its Act, the Commission is required to examine the economy-wide effects of policy changes. In the context of the automotive industry inquiry, this means that the Commission is required to evaluate changes in the tariff from the perspective of the entire community, not just the automotive industry.

Market interdependencies mean that the impact of changes in economic policy affecting one industry can have differential impacts on other industries, commodities, households and regions. Industries supply goods and services to each other, they compete for the economy's supplies of labour and capital, they compete for sales in domestic markets and they interact with each other via international trade.

The assessment of industry protection issues therefore requires an economy-wide framework that takes into consideration:

- the main features of the market studied; and
- the interactions of this market with other markets in the economy.

Implicitly or explicitly, all analysts make use of models. Some models represent the economy by a system of mathematical expressions. Other models are based on qualitative concepts, intuition and personal experience. Irrespective of form, models make analysing a problem manageable in that they simplify the real world by concentrating on its important elements. To be useful, a model must capture those features of the economy that are central to the issue under examination and leave aside details that are of secondary importance.

As an aid to assessing industry policy issues, the Commission has been involved in the development of a number of large scale models. In these models, the economy is characterised as a complete system of interdependent markets and agents. The models contain the most detailed account of economic transactions permitted by the available data. They identify many different types of industries and commodities and account for interdependencies that arise from the flows of goods, services and factors (such as labour and capital) from suppliers to users.

The models used by the Commission combine relationships based on economic principles and data. As with any model, formal or informal, simplifying assumptions must be made about the behaviour of industries and consumers as well as the market structures within which they operate. Data are needed to quantify the relationships and ascertain the importance of the interactions between them.

Although the models abstract from the complexity of the real world, they help to inform policy-makers by providing insights that cannot be obtained from informal analysis or from less detailed models.

The place of quantitative models in the Commission's work is to assist in making informed judgements on matters of policy. The model results are only one source of information used to form these judgements. Other sources of information are equally important.

The Commission recognises that many factors cannot be included in a model. However, the Commission believes that models provide valuable insights into the effects of policy reform on the performance of industries and the economy as a whole.

O.2 Why use MONASH?

Until recently ORANI was the best computable general equilibrium model available to the Commission for analysing protection issues. Like any model, ORANI has its strengths and weaknesses and these must be continually reassessed in terms of the purpose for which the model is being used and the availability of alternative analytical tools.

The Commission's view is that there is a need for new insights into protection issues that are not available in ORANI. The industry protection debate has moved on from the broader issue of whether or not protection should be reduced to more specific issues of how quickly protection should be reduced and to what level.

The Commission viewed the availability of the recently developed MONASH model as an opportunity to enhance its analysis of industry protection issues. In particular, MONASH offers a framework for analysing several issues that were acknowledged as important in past studies but not analysed in any detail. Among other things, MONASH enables the analysis of:

- reductions in the tariff that are phased in over time;
- the process by which the economy adjusts over time to a change in the level of protection;
- the regional effects of policy changes; and
- the impact of tariff reductions on specific industries.

MONASH has been an important development supported by the Commission; its use seeks to overcome some of the limitations and criticisms of its earlier modelling work.

O.3 MONASH modelling framework

MONASH is a multi-period extension of ORANI. It is a sequence of single-period models, linked through time by the behaviour of investment and labour markets.

The MONASH model is composed of three elements — theory, a database and parameters. The theoretical structure, data and parameters embodied in the model's system of equations describe how industries and consumers respond to changes in policy.

O.3.1 Database

The database used by MONASH is similar but more extensive than that used by ORANI. It is based on the Australian Bureau of Statistics' (ABS) input–output tables.[1] These show commodity flows for over 100 commodities and industries (ABS 1996c).[2] The input–output data are modified to account for some peculiarities of the Australian agricultural production system (see Higgs 1986). These are also supplemented by labour statistics on employment by industry and occupation and disaggregated data on the commodity composition of private and public investment.

In essence, input–output tables show:

- the flow of industry outputs to other industries (termed 'intermediate demands'), final demands by households (consumption), government, investment (for capital formation purposes) and exports; and
- the cost structures of industries in terms of intermediate inputs of commodities (goods and services supplied by domestic industries and by imports), primary factors of production (labour, capital and agricultural land) and commodity taxes and subsidies.

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1 Documentation for the input–output tables is found in *Australian National Accounts: concepts, sources and methods* (ABS 1990b).

2 Given its high level of disaggregation (more than 100 industries), the database can support a highly disaggregate set of industries which improves its analysis of allocative issues facing the economy. For example, the MONASH model can be used to analyse the effects on industries in the manufacturing sector of selectively reducing tariff protection of one industry in this sector.

The MONASH database provides a detailed description of the structure of production and demands in the Australian economy. It accounts for taxes and subsidies on all transactions. It also includes margins which represent the costs associated with transferring a product from the firm or the wharf (in the case of imports) to consumers and other users. Taxes and margins represent the difference between the cost of providing a good or service (at the firm level) and the price paid by the user. Tariffs are treated as a commodity tax on imports.

O.3.2 Theory

MONASH uses economic theory to specify the behaviour of producers, consumers, foreigners and investors. It also has a government sector, the behaviour of which is modelled separately.

MONASH is a general purpose model that can be used to analyse a wide variety of questions. The framework of MONASH is flexible, allowing it to accommodate alternative theories about how the economy operates. For example, the model is typically run under the assumption of constant returns to scale, but it can be altered to include increasing returns to scale in one or more industries. This is particularly important in an industry like passenger motor vehicles where economies of scale can be important. The labour market adjustment mechanism, regulating how employment and wages adjust over time in response to a change in labour demand, can also be varied.

The theoretical structure of the model contains many more variables than equations. Therefore, it is necessary to specify a subset of the variables as being predetermined.[3] The choice of which variables are predetermined varies with the application at hand and reflects the analyst's judgement of the theory most appropriate to the study.

O.3.3 Parameters

The theoretical structure of MONASH requires many behavioural parameters which govern the degree to which the behaviour of producers, consumers, investors and foreigners changes in response to economic signals, such as price changes.

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[3] MONASH is a simultaneous equations system which has a total number of m equations and n variables, where $n>m$. In order to solve such a system, it is necessary to predetermine (that is, set exogenously or take as given) the values for (n-m) of the variables and solve for the remaining (m) variables.

Box O.1 provides a list of references giving further details on the structure and application of the MONASH model.

Box O.1: Documentation on the MONASH model

No single reference on the MONASH model currently exists. The following papers give detailed information on how the model is structured and used for forecasting and policy analysis, historical analysis and regional analysis. Full documentation is currently being prepared and its release is forthcoming.

Overview of the MONASH model

Adams, P., Dixon, P., McDonald, D., Meagher, G., and Parmenter, B. 1994, 'Forecasts for the Australian economy using the Monash model', *International Journal of Forecasting*, no. 10, pp. 557–571.

Parmenter, B. 1995, 'Forecasting and policy analysis with the Monash model' paper prepared for the International Symposium on Economic Modelling, Bologna, Italy, 19–21 July.

Behavioural theory in detail (excluding capital)

Dixon, P., Parmenter, B., Sutton, J., and Vincent, D. (DPSV) 1982, *ORANI: a Multisectoral Model of the Australian Economy*, North–Holland, Amsterdam.

Capital accumulation theory

Dixon, P., and Malakellis, M. 1996, 'Investment Behaviour in the MONASH Model of the Australian Economy', in Vlacic, L.J., Nguyen, T., and Cecez-Kecemanovic, D. (eds.), *Modelling and Control of National and Regional Economies 1995*, Pergamon, Oxford.

Historical analysis

Dixon, P., and McDonald, D. 1993, *An explanation of structural changes in the Australian economy: 1986–87 to 1990–91*, Background Paper no. 29, Economic Planning and Advisory Commission, Canberra, June.

Forecasting

CoPS (Centre of Policy Studies) 1996, *Guide to Growth*, CoPS, Monash University, Melbourne.

Policy analysis

IC (Industry Commission) 1996d, *The Pharmaceutical Industry*, Report No. 51, AGPS, Canberra.

Regional analysis

Adams, P.D. and Dixon, P. 1995, 'Prospects for Australian Industries, States and Regions: 1993–94 to 2001–02', *Australian Bulletin of Labour*, vol. 21, no. 2, pp. 87–108.

The values for parameters in MONASH are either derived from the input–output database (for example, budget shares) or from other external sources (for example, import substitution elasticities).

The model can accommodate a range of values and be tested for sensitivity to these values.

O.4 Modelling tariff policy

MONASH is a flexible model that can be used in three distinct modes — *historical*, *forecasting*, and *policy analysis*. In this inquiry all three modes are used in a sequence, as outlined in Box O.2.

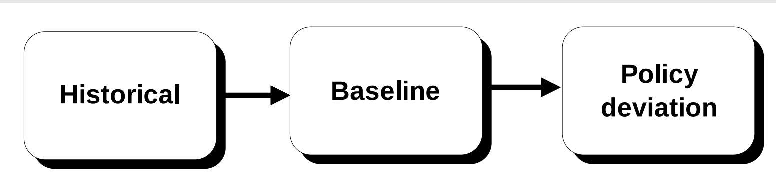
Box O.2: **Using the Monash model over the period 1996–97 to 2009–10**

To assess the impact of tariff changes, a three step procedure is followed.

The first step involves generating an up-to-date picture of the economy's structure using a historical simulation. The historical simulation also provides information on changes in productivity and consumer preferences that occurred in the historical period which can be used to form views about how these may change in the future.

The second step uses forecasts of macroeconomic variables and changes in technology and consumer preferences to generate the baseline projection of the economy's future structure.

Finally, a policy deviation simulation is carried out. The policy deviation simulation shows how the economy's structure differs from the baseline, as a result of the change in policy, such as a reduction in tariff.



O.4.1 Historical analysis

The historical analysis serves three related purposes:

- it facilitates the development of an up-to-date database;
- it provides estimates of changes in technology and consumer preferences that occurred in the historical period; and
- it provides a basis for studying the contribution of various factors to structural change that occurred over the historical period.

In the context of examining tariff policy for the automotive industry, the timeliness of data is particularly important. The distortionary effects of the tariff, indirect taxes and labour market rigidities on the allocation of resources change over time.

Input–output data are published less frequently than other data relating to the structure of the economy. More up-to-date data at various levels of aggregation are available on rates of industry protection, export and import volumes and prices, employment, capital stocks and investment, commodity outputs, household consumption, public consumption, wages, the exchange rate, inflation, population growth, and so on. In the historical analysis, these data are used to update the latest available input–output data.

In historical mode a single-period configuration of MONASH is used. For this report the single period is 8 years long. Using data based on the 1986–87 input–output tables as the starting point,[4] MONASH is used to generate an updated database that fits with the observed structure of the economy in 1993–94.[5] An advantage of this procedure for updating the input–output data is that it is based on explicit economic assumptions.[6]

Box O.3: **Calculating preference and supply change**

Take as an illustrative example, the demand for vegetables (based on a Cobb-Douglas utility function) and a linear supply function. The demand curve is given by $Q = bM/P$ where Q is the quantity demanded, b is a parameter reflecting consumer preference for vegetables, M is income and P is the price of vegetables. Suppose that we observe Q,

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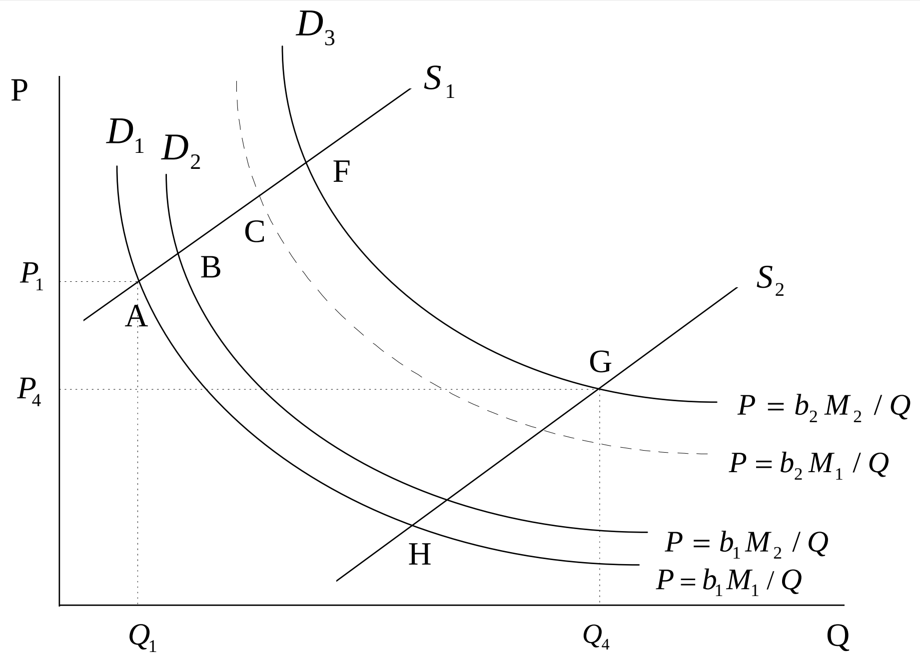
4 Although the ABS has published input–output tables for 1992–93, in their current form they are not suitable for calibrating the MONASH model. The ABS input–output tables are the starting point for constructing the MONASH database. The data contained in the ABS input–output tables is modified to accommodate more detail on: the structure of imports; the structure of investment; and the structure of indirect taxes and margins (that is, services such as retail trade and transport which are used in transferring goods and services from producers to users).

5 The reason for projecting forward to 1993–94 rather than to 1995–96 is the lack of detailed data. The latest year for which consistent disaggregate data is available is 1993–94. Note that the first year of the MONASH policy simulations is 1995–96. Data for this year is generated by a series of annual forecasts starting from the 1993–94 database. As will be explained later, the forecasting exercise that takes the economy from 1993–94 to 1995–96 is similar to the historical exercise that takes the economy from 1986–87 to 1993–94.

6 An alternative method for updating input–output data is to use a RAS type of procedure (see Bacharach 1970). As typically used, the RAS procedures are statistical techniques in which input–output data are scaled to accord with pre-specified values of key items of data (usually aggregates). A potential limitation of this approach is that the scaling procedures used are not based on economic principles.

M and P in two periods. Point A is the first period's observed market equilibrium, when income is M_1. Point G is the second period's observed market equilibrium, when income is M_2. Because the two points A and G are market equilibria, they must have demand and supply curves passing through them.



To reconcile the observed equilibria, there must have occurred an increase in the preference for vegetables by consumers and a shift in the supply curve (technical change) by producers. The movement from A to B accounts for the change in quantity due to the change in income. The movement from A to C accounts for the change in quantity due to the change in preferences. The point F is the change in quantity from both changes in preferences and income, assuming supply is unchanged. The movement from A to H is the change in quantity from the shift in the supply curve. This shift in supply represents changes in production costs, which for purposes of illustration will be assumed to be solely due to changes in technology (other shifts, such as those due to lower intermediate input prices are accounted for in MONASH). Combining together the shifts in demand due to income and preference changes with the technology-induced shift in supply generates the equilibrium point G.

To update the MONASH database, the observed changes in economic variables between 1986–87 and 1993–94 are set as predetermined variables. The MONASH model solves for the values of the remainder of the variables so that values for these variables are obtained. That is, it solves for the variables whose movements over the period 1986–87 to 1993–94 are unobserved.

Included in this set of unobserved variables are technical changes, household preferences, and foreign demand and supply conditions. No details about the *paths* of variables over the period 1986–87 to 1993–94 are obtained in this exercise because, in historical mode, MONASH does not divide the 1986–87 to 1993–94 period into eight distinct years.

Box O.3 uses a simple example to illustrate the key principles underlying the MONASH updating procedure.

MONASH can be used to calculate the contribution of each factor to the change in an economic variable between 1986–87 and 1993–94. The purpose of decomposing the results obtained in the MONASH updating procedure is to assess the relative importance of key factors such as government policy changes, changes in technology and preferences, changes in foreign demand conditions and so on.

Appendix M provides a complete historical analysis of the relative importance of various factors (including reductions in the tariff, changes in consumer tastes, technological change and general economic growth) that influenced the structure of the economy and the automotive industry between 1986–87 and 1993–94.

O.4.2 Baseline simulation

The baseline simulation produces a database for each year of the forward looking period. The changing composition of the databases indicates the changing structure of the economy. Structural change is determined by the interaction of the behavioural theory, data, parameters and the way in which labour and capital stocks adjust through time.

The baseline simulation shows how the underlying structure of the economy is expected to change through time in the absence of any new policy change. The basecase incorporates predetermined policy changes, such as the gradual reduction in the automotive tariff to 15 per cent by 2000. Where little information about the economy and policies is available (such as beyond 2000 for the tariff and 2003 for macroeconomic forecasts), relatively neutral assumptions based on the latest available data are made to extend the basecase to 2009–10. The baseline simulation is generated by modelling changes in endowments (factors of production), preferences and the structure of the economy that are consistent with macroeconomic, industry and trade forecasts.

As explained in the previous section, the historical updating procedure provides a database that represents the structure of the economy in 1993–94. To obtain a database that is representative of the structure of the economy in the current year, 1996–97, MONASH is used in forecasting mode to generate annual projections for the three years 1994–95 to 1996–97.

In making these projections, the user must choose the variables that will be pre-determined (that is, those whose values will be set by the user) and those that will be determined by the model. This process for updating the database is similar to that used in the historical updating procedure. The main difference between the two updating procedures is that in forecasting mode the database is updated one year at a time.

There is limited data available for the period 1994–95 to 1995–96 that are consistent. Data that are available include rates of industry protection and exports of a range of rural and mining commodities. Also available are detailed scenarios on the structure of taste changes and technical changes inferred from the MONASH historical analysis.

At the aggregate level, data are readily available on macroeconomic aggregates such as employment, wages, private and public consumption, private and public investment, exports and imports, inflation, the exchange rate, population growth and so on.

In each year of the forecast horizon 1994–95 to 1995–96 values are assigned to the variables for which historical data are available. Values must also be assigned to the technical change and consumer preference change variables. In setting the values of these variables the user must exercise judgement about how much of the taste changes and technical changes inferred from the historical analysis should be carried over to the forecast period (for example, the user must decide the extent to which the change in tastes away from tobacco products inferred in the historical analysis will continue in the forecast period).

Given this information on observed variables and on inferred technical and consumer preference changes, MONASH produces annual projections for those variables that are on its database but for which data are unavailable.[7]

MONASH forecasts the structure of the economy from 1996–97 to 2009–10 incorporating information from external sources with expertise in particular facets of the economy. For example, macroeconomics (Treasury and other sources), trade policy (IC), commodities (Australian Bureau of Agricultural and Resource Economics) and tourism (Bureau of Tourism Research). Data from these forecasts are used to predetermine the values of the appropriate MONASH variables in each year of the simulation period. MONASH also incorporates

[7] Note that only a limited amount of data relating to the last six months of 1996–97 are available. Thus, the values of the 'observed' variables in 1996–97 are really forecasts which are heavily conditioned by information available for the first half of the year.

external information on expected government policy and shifts in technology and consumer preferences. The model then solves for the industry variables that are consistent with these external projections.

For example, in the baseline simulation, growth rates of GDP, employment and aggregate investment are set to values from a macroeconomic forecast. The model then solves for the implied value of economy-wide primary-factor-saving technical change necessary to reconcile the assumed growth of output and factor inputs.

A further example is the determination of households' propensity to consume. Aggregate household spending and aggregate household income are both parts of the baseline macroeconomic scenario. The model's baseline solution calculates the shift in the households' implied propensity to consume for each year, necessary to reconcile the assumed values of these two variables.

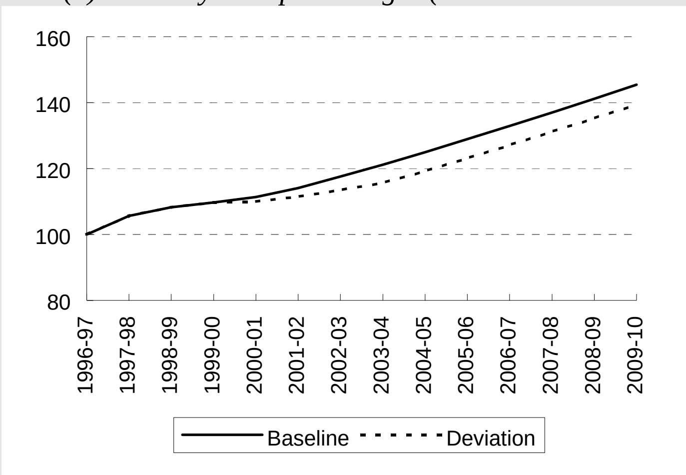
O.4.3 Policy simulation

The policy simulation incorporates the effect of a policy option as a deviation from the baseline. The difference between the two is interpreted as the effect of the policy option in isolation from other factors. Box O.4 illustrates the principles used in obtaining the effects of a policy change for two hypothetical industries.

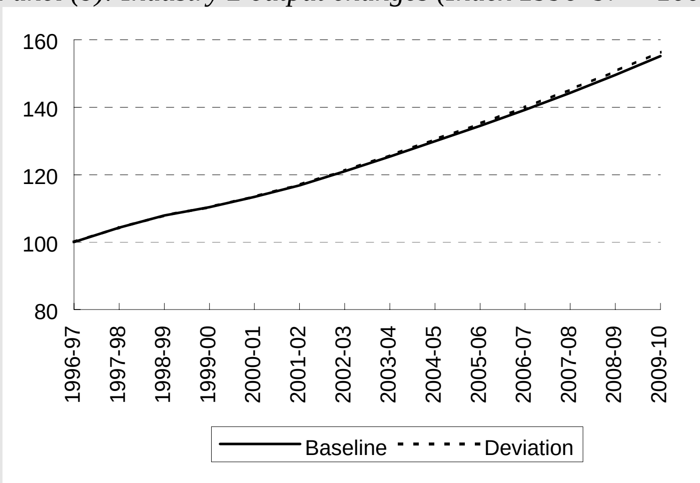
Box O.4: **Policy analysis using the MONASH model**

The MONASH model is mainly used by the Commission to evaluate the structural impact on the economy of a change in government policy. The evaluation is made by comparing a baseline scenario of the economy's structure with a policy-induced deviation. Panel (a) and Panel (b) show output in two industries, for the baseline and policy deviation scenarios.

Panel (a): Industry 1 output changes (Index 1996–97 = 100)



Panel (b): Industry 2 output changes (Index 1996–97 = 100)



The vertical difference between the two lines in Panel (a), at the end of the forecast period is around 6 per cent of the baseline level of output. This indicates that the effect of implementing the policy option is to decrease Industry 1's output by around 6 per cent below the baseline by the year 2010. In Panel (b), the same policy change benefits Industry 2, whose output at the end of the period is around 1 per cent higher than it would otherwise be.

The policy simulation is generated by swapping some of the predetermined variables in the baseline simulation with endogenous variables. The change in the endogenous variables solved for in the baseline simulation is now treated as predetermined. The policy simulation treats the changes in technology, shifts in export supply and demand curves, and macroeconomic parameters (which were solved for in the baseline forecast) as predetermined, while the corresponding macroeconomic variables (which were predetermined in the baseline) need to be solved for. Changes in GDP and real consumption now reflect the changes in technology and the propensity to consume as well as the effects of the change in policy.

In the absence of a policy change, the policy simulation generates the baseline.

O.5 Regional disaggregation of results

State and regional economies may have a greater (or lesser) dependence on particular industries than the economy as a whole. Consequently, economic developments which affect an industry at the national level can have a magnified (or diminished) impact on a State or region which is relatively more (or less) reliant on a particular industry.

How changes in policy impact on the overall economic activity and employment in a State (or region) depends on the assisted industry's contribution to State (or regional) output relative to other industries. Other industries may benefit from the reduction in their intermediate input costs induced by reduced assistance. As a result, these other industries will increase their output and employment. Regional analysis can determine whether this increase is sufficient to offset the effects of the downturn in the assisted industry.

In MONASH, regional results are generated using the *tops-down* approach[8] described in Adams and Dixon (1995), based on the ORANI regional equation system in Dixon *et al.* (1982). In mapping national results to regions a distinction is made between *national* industries and *local* industries. National industries are assumed to be those which produce a commodity that is highly tradeable on inter-regional markets (for example, automobiles, clothing and other non-perishable and easily transported products). Because of the tradeable nature of their output, the fortunes of national industries are assumed to be dependent mainly on factors outside of the region in which they are located. Conversely, local industries are assumed to be those producing goods that are

8 See Appendix P for a description of the two alternatives for modelling the regional consequences of a change in economic circumstances.

not heavily traded in inter-regional markets (for example, most services and perishable commodities). The fortunes of local industries are assumed to be dependent mainly on factors specific to the region in which they are located.

Given the distinction between national and local industries the national results in MONASH are mapped to the States in a two step procedure. First, the economy-wide projections for national industries are allocated to the regions on the basis of regional employment shares. For example, if employment in a national industry increases by 10 per cent at the economy-wide level, then it is assumed that in each State employment in that industry also increases by 10 per cent. Second, projections for the local industries are obtained by computing the induced effects on the State economies implied by the projections for the national industries. For example, if a national industry located in Victoria is projected to expand by 10 per cent it will directly stimulate the local industries which supply inputs to the national industry. In this example local industries will also be stimulated indirectly via input–output linkages (that is, the local industries that supply inputs to the national industries will stimulate the demand for inputs from other local industries) and via local income effects (that is, the increase in activity in the State will stimulate regional consumption).

O.6 Theoretical developments

The MONASH model includes explicit theory to capture the likely adjustment processes of producers and consumers faced with some change in the economic environment. The type of behaviour reflected in its equations is derived from microeconomic theory. It portrays producers seeking to minimise costs (within certain constraints) and consumers seeking (again, within limits) to maximise utility (or to minimise the cost of achieving a certain level of consumption).

There is a strong similarity between the theoretical structure of the single-period models that make up MONASH and the theoretical structure of ORANI. Given that ORANI is exhaustively documented elsewhere this section focuses on six key differences between the theoretical structures of the two models.[9] These are the specifications of:

- investment behaviour;
- labour market behaviour;

[9] Comparisons with ORANI are made with the version in Dixon *et al.* (1982). More recent versions of ORANI used at the Commission had resolved a number of issues regarding the treatment of capital and labour markets and a full set of government sector accounts (see IAC 1987, Dee 1989).

- aggregate private household behaviour;
- the revenue side of the government accounts;
- exports of goods and services not related to mining and agriculture (for example, manufactured goods and tourism); and
- regional supplies and demands.

In these six areas (and others), the theories incorporated in the model can be changed, according to the application. After outlining some of the theories that MONASH can incorporate, the theory adopted by the Commission for this study of the Australian automotive industry is outlined.

O.6.1 Investment behaviour

MONASH investment theory explains year-to-year changes in industry capital stocks. As in ORANI, capital goods are industry specific in MONASH.[10] The investment process in MONASH is characterised by a one year lag between the commitment of resources to the creation of capital and the availability of this capital for use in the production process. That is, investment undertaken in each year comes on stream in the following year. Thus, the stock of capital available to each industry in each year is predetermined because it depends on investments undertaken in previous years.

Capital is assumed to depreciate at a fixed rate so that some investment is necessary to maintain the capital stock at its current level. Because capital is industry-specific, investment decisions are assumed to be irreversible. That is, once capital is installed in a particular industry it cannot be sold to any other industry. Under these conditions the industry-specific rate of depreciation determines the maximum annual rate at which an industry can reduce its capital stock.

A key variable motivating investment behaviour in MONASH is the expected post-tax profitability of capital. The post-tax profitability of a unit of capital in an industry in each year is equal to the present value of the stream of expected future after-tax earnings accruing to that unit of capital.[11] To produce a unit of capital that comes on stream in the next year investors must outlay funds in the current year. The profitability of an investment in the current year that yields a unit of capital in the following year is equal to:

[10] The technology for producing capital goods in MONASH is the same as that in ORANI.

[11] MONASH allows for taxes on capital rents and capital gains.

the post-tax rental income expected from that unit of capital in the next year (when it comes on stream) discounted back to present year values by the post-tax rate of interest

PLUS

the replacement cost of the depreciated unit of capital in the next year (that is, the value of the unit of capital after it has been used for one year) discounted back to present year values by the post-tax rate of interest

MINUS

the cost of the investment in the current year that is necessary to create a unit of productive capital in the next year

MINUS (PLUS)

the taxes (tax credits) accruing on expected capital gains (losses) discounted back to present year values by the post-tax rate of interest.

The expected profitability of investment undertaken in the current year depends on expectations about outcomes in the following year (for example, rental income, replacement cost of capital and capital gains). MONASH allows some flexibility in the choice of assumptions governing the way investors form their expectations about future events. In the simulations conducted for this report investors' expectations are assumed to be static. That is, investors form their expectations about future events using information from the current period only. For example, in a given year investors form expectations about prices in the next year by assuming that the rate of inflation is constant. Note that in this treatment of expectations there is no presumption that expectations are actually realised.[12]

Apart from the rental price of capital (which together with the quantity of capital used determines the pre-tax rental income), the variables that determine the profitability of investment in a particular industry are determined largely outside the industry. The cost of constructing a unit of capital in industry j depends on the costs of inputs purchased from other industries (for example, from the construction industry). Similarly, the rate of interest is determined on world capital markets. The rental price of capital reflects its scarcity value. Other things constant, with a given amount of capital in place in industry j, the

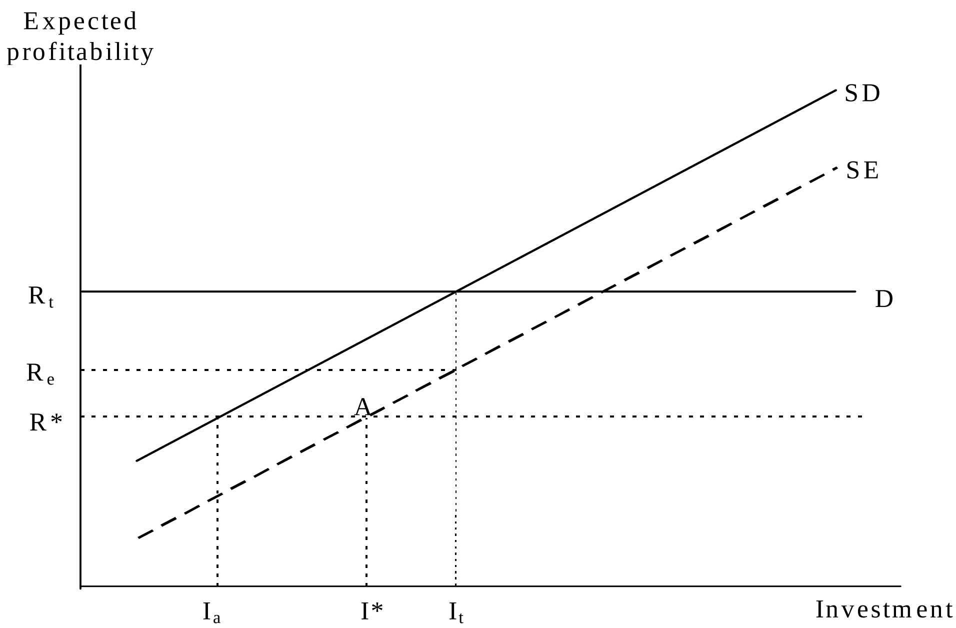
[12] Under the alternative treatment of expectations in MONASH, investors form expectations about future outcomes using the model's projections of these outcomes. For example, in the current year, investors form their expectations about next year's prices on the basis of MONASH's projections for prices next year. Under this specification expectations are assumed to be realised.

rental price of capital will be higher the greater is the demand for that industry's output and vice versa.

There is no variation across industries in interest rates and tax rates and there is little variation across industries in the costs of constructing capital as most industries use similar inputs to construct their capital (for example, a large proportion of most industries' demand for inputs to create capital are supplied by the construction industry). Thus, the profitability of investment will vary across industries mainly because of variations across industries in the rental price of capital.

A simple illustration of the key mechanisms underlying the MONASH investment theory is provided in Figure O.1.

Figure O.1: **Stylised representation of investment behaviour**



Although the actual mechanism used by MONASH is more complicated, the essence of how MONASH handles investment and capital accumulation is captured in the figure. The main difference between the complexity of MONASH and the stylised representation in Figure O.1 is that many variables that Figure O.1 assumes to be unchanged are allowed to vary in MONASH. These changes have the effect of further shifting the curves in Figure O.1

around. Abstracting from these secondary shifts allows the key mechanisms underlying capital stock adjustments to be explained relatively simply.

In Figure O.1, the demand and supply curves relate to investment behaviour in an industry in the current year. The demand curve, labelled *D*, is flat because investors expect that the profitability of investment in the current year will be equal to R_t, the realised profitability of investment undertaken in the previous year. Thus, investors behave as if the profitability of investment in the current year is not influenced by the amount of investment demanded in that year.

Two supply curves (*SE* and *SD*) are shown. The slope of these reflects the assumption that the supply of investment is positively related to expected profitability. The higher the expected profitability of investment, the higher will be the supply of investment and vice versa.

The supply curve *SE* represents the equilibrium supply relationship for the current year. It passes through point *A*, which represents the combination of expected profitability and capital growth that is considered normal for this industry. The normal expected rate of profitability, R^*, is inferred from historical data. The amount of investment required in the current year to achieve a normal rate of capital growth, I^*, is inferred from historical data and from projected trends in the preceding years.

For example, if over several years of a projection period an industry's capital grows by more than the normal rate inferred from history then, over time, the normal rate of growth that is consistent with the given normal rate of profitability is allowed to trend upwards. One interpretation of this type of behaviour is that investors become accustomed to a particular combination of profitability and capital growth for an industry and they react cautiously to changes in this combination.

The second supply curve (*SD*) represents the disequilibrium supply relationship. While the equilibrium supply curve shows combinations of expected profitability and *desired* investment, the disequilibrium supply curve shows combinations of expected profitability and *actual* investment. Thus, the market clearing level of investment for the current year is I_t which is consistent with the intersection of the demand curve with the disequilibrium supply curve.

Over time the disequilibrium supply relationship is driven gradually closer to the equilibrium supply relationship. An interpretation of the gradual adjustment of the disequilibrium supply curve towards the equilibrium supply curve is that investors are cautious and react slowly to new information.

For example, as shown in Figure O.1, if the rate of profitability in the current year happened to be R^*, actual investment would be I_a rather than I^*. Such an outcome is consistent with the equilibrium rate of profitability in the previous year being lower than R^*. If the rate of profitability settles at R^* for several years, then investment will converge to I^*.

In moving from one year to the next, all three curves shown in Figure O.1 can adjust. Except in the long run, the expected profitability of investment made in the current year will not be realised in the following year. Thus, the demand curve will move up or down to reflect the rate of profitability realised in the following year on investment made in the current year. The realised rate of profitability of investment made in the current year will depend mainly on the scarcity of capital in the following year.

For any particular industry this will be influenced by the demand for its output, the rental price of capital relative to the price of other primary factors (such as labour), the capital intensity of the industry, and the degree of substitutability of capital with other primary factors. Other things constant, the higher the expected profitability of investment in the current year, the higher will be investment in that year and the higher will be the stock of capital in the next year. Again, other things constant, the more capital there is in place in the current year the lower will be the scarcity value of capital (indicated by its rental price), and the lower will be the realised profitability in the next year of investment done in the current year. Since the realised profitability in the following year motivates investment in that year, a fall in the realised profitability in the following year will tend to dampen investment in that year.

In Figure O.1 a fall in the realised profitability will cause the demand curve to shift down. As already explained, the equilibrium supply curve can move gradually over time to reflect persistent trends in an industry's capital growth. In the Commission's simulations in Appendix N, the disequilibrium supply curve is assumed to move each year to eliminate 25 per cent of the vertical gap between R_t, the expected rate of profitability of the investment done in the current year, and R_e, the rate of profitability that such an investment would earn in equilibrium.

O.6.2 Labour market behaviour

In ORANI there are two alternative treatments of the labour market. One assumes that the supply of labour is predetermined and that real wages adjust to clear the labour market. The other assumes that there is an excess supply of labour and that the demand for labour adjusts to accommodate a predetermined pre-tax real wage.

MONASH has a more flexible treatment of labour markets than ORANI. There are five options available in MONASH.

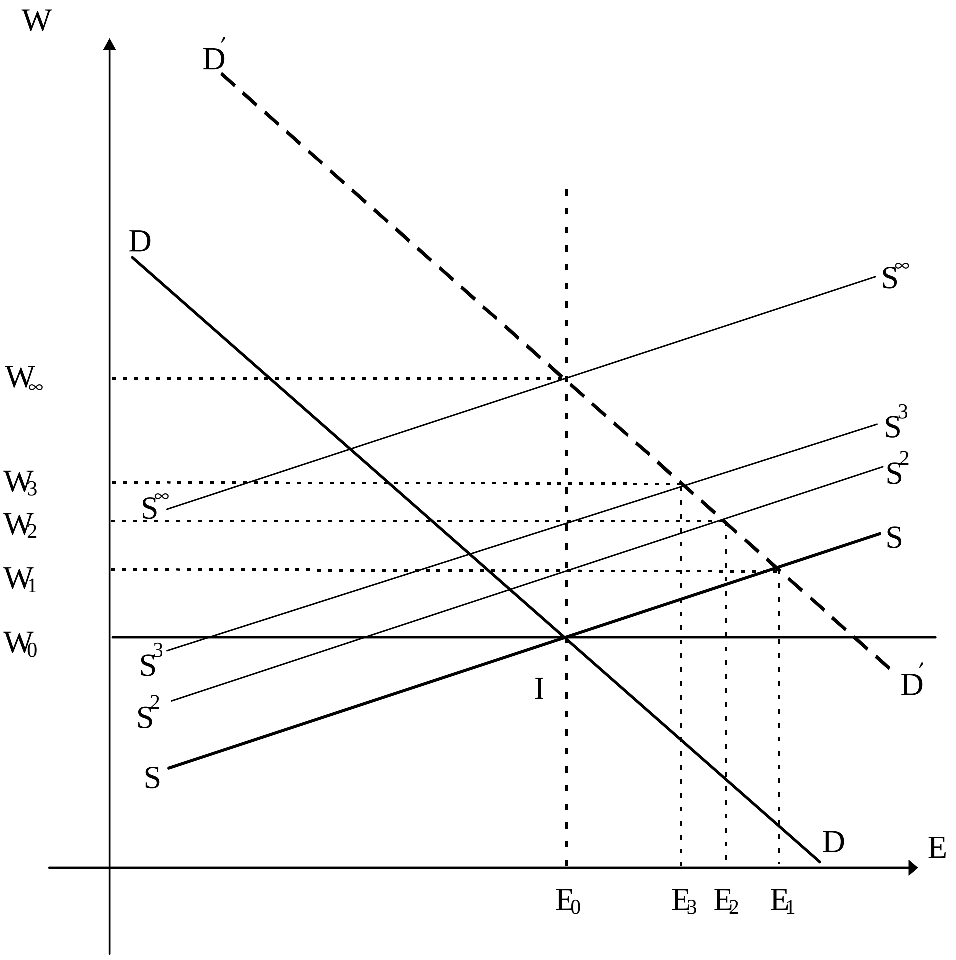
1. In each year, aggregate employment is predetermined with real wages allowed to adjust.
2. In each year, the pre-tax wage is predetermined with aggregate employment allowed to adjust.
3. In each year, the post-tax wage is predetermined with aggregate employment allowed to adjust.
4. In a combination of the first two options, there is assumed to be a trade-off between real pre-tax wages and aggregate employment over time. The response of real pre-tax wages to a disturbance in the labour market (for example, as a result of a fiscal stimulus or a change in the tariff) is assumed to be sluggish initially (because of institutional arrangements).
5. An alternative version of option 4 assumes there is a trade-off between post-tax, rather than pre-tax, real wages and aggregate employment over time.

In its analysis of the effects of reducing the automotive tariff, the Commission assumes that in the long run, the aggregate supply of labour is determined by factors which are unaffected by tariff policy changes. This assumption is based on the work of Vincent (1980), and is consistent with the macroeconomic concept of non-accelerating-inflation rate of unemployment (NAIRU). The adoption of this assumption requires MONASH to implement either option 4 or option 5 above. The Commission’s modelling in Appendix N uses option 5.

Imposing a NAIRU results in wages becoming increasingly more flexible over time as agents become accustomed to the disturbance. Initially, when the response of real wages is assumed to be sluggish, disturbances in the labour market are accommodated mainly by adjustments in aggregate employment. Concomitant with the gradual increase in the flexibility of real wages is a gradual erosion of the initial employment gains or losses. Eventually, the adjustment in real wages will be sufficient to eliminate all employment gains or losses from the disturbance.

Figure O.2 provides a stylised representation of the dynamic relationship between employment and wages used by the Commission. As in the case of capital the actual mechanism used by MONASH is more complicated than that outlined in the figure, but the essence of how MONASH handles labour market adjustment is captured. The stylised representation is for a special case that assumes that technology, consumer tastes, foreign prices and capital availability are unchanged from year to year. (In MONASH, these variables and others are allowed to vary from year to year, thereby shifting the demand and supply curves around even more than the movements described next).

Figure O.2: **Stylised representation of the dynamic relationship between employment and wages**



In the absence of a perturbation, the demand curve for labour in each year is *DD* and the supply curve is *SS*. In each year the NAIRU level of employment is E_0 and the real post-tax wage rate W_0 — that is, the employment-wage combination is at point *I* in Figure O.2. The introduction of a perturbation is assumed to move the demand curve for labour up to *D′D′*, where it remains for all future years. The supply curve for year 1 is the initial supply curve *SS*. Taking into account the effects of the disturbance, the levels for employment and the real wage rate in year 1 are E_1 and W_1. In year 2 there is a vertical upward shift in the supply curve reflecting the gap between W_1 and W_0. In the diagram employment and the real wage rate in year 2 are E_2 and W_2. Eventually the supply curve for labour stops moving when W reaches $W_{\nearrow}$. At this stage employment has returned to E_0.

O.6.3 Aggregate private household behaviour

In ORANI aggregate consumption can be modelled in a variety of ways. One approach is to assume that net borrowings from overseas adjust to accommodate a predetermined level of aggregate consumption. An alternative approach is to assume that aggregate consumption adjusts to accommodate a predetermined level of net borrowings from overseas. Other options available in ORANI include holding constant the ratio of aggregate consumption to an expenditure aggregate such as aggregate investment, GNE or GDP.

MONASH contains the same options for modelling aggregate consumption as in ORANI.

However, MONASH also has an additional option, in which aggregate consumption is driven by household disposable income. Household disposable income in each year is equal to the sum of factor incomes (that is, returns to labour, capital and agricultural land); less income taxes paid; less income accruing to foreigners; plus net transfers from the government (for example, unemployment benefits).

The Commission’s modelling in Appendix N adopts this last option for specifying aggregate consumption.

O.6.4 Government revenue

The government funds its expenditure through taxes and is able to run deficits. Taxation revenue is derived from two sources: net indirect taxes (commodity taxes and subsidies) and income taxes.

In ORANI indirect taxes are explicitly modelled but income taxes are not. This limits the range of options available for specifying how the government collects revenue.

In MONASH indirect taxes and income taxes are explicitly modelled. The explicit treatment of income taxes is necessary for defining household disposable income which, as explained above, can be used to drive aggregate consumption. Explicit treatment of income taxes is also necessary for modelling the revenue side of the government accounts.

The specification of the revenue side of the government accounts in MONASH provides additional flexibility for modelling the government's fiscal reaction. For example, in MONASH a deterioration in the government's budgetary position caused by the loss of tariff revenue may be offset by adjusting any one or more of the following: indirect tax rates; income tax rates; or government expenditure.

The baseline simulations in Appendix N used macroeconomic forecasts to exogenously set the level (and composition) of government expenditure. The policy simulations assumed that aggregate government expenditure and the level of the deficit were fixed, with the fall in tariff revenue being compensated by an increase in income taxes.

O.6.5 Exports — traditional and non-traditional

MONASH does not explicitly account for the behaviour of foreign users of Australian products. MONASH, like ORANI, divides exports into two categories: traditional and non-traditional. The former category includes commodities for which exports account for more than 20 per cent of domestic output. The key examples of traditional export commodities are wool, wheat, non-ferrous metal ores and black coal. The remainder of the ORANI export commodities fall into the non-traditional category. Examples of non-traditional export commodities are motor vehicles, petroleum products and education.

The treatment of traditional exports in MONASH is the same as in ORANI. Both models assume that the demand for exports of each traditional commodity is a function of its foreign currency price and its export demand elasticity. The export demand elasticities used in MONASH reflect the sensitivity of the world price to increases in Australian export volumes. That is, the elasticities reflect whether Australia can or cannot influence the world price of commodities.

In export-oriented industries producing goods that are not highly differentiated, or where Australia has only a small share of the world market, export demands are modelled as being highly price sensitive — Australian export volumes have no influence on the world price. Where Australia has a significant share of the world or regional market (for example in wool) or where exports are of highly differentiated products (for example, scientific equipment), exports are modelled as being price sensitive, but to a much lower degree. In these cases, Australian export volumes have some influence on world prices.

The MONASH treatment of non-traditional exports is markedly different to that in ORANI. In ORANI sales of non-traditional exports are predetermined. MONASH retains this ORANI treatment of non-traditional exports as an option but offers a range of alternative specifications.

In the treatment of non-traditional exports used in Appendix N, the demand by foreigners is assumed to be for a bundle of export commodities (that is, a combination of different types of exports) rather than for individual export goods. Two bundles of non-traditional export goods are distinguished.

The first bundle contains tourism-related exports (for example, Air transport, Entertainment, Hotels and restaurants, and Personal services). The second bundle contains all other non-traditional export commodities, including so-called elaborately transformed manufactures. For convenience, this second bundle is referred to as the miscellaneous export bundle.

Analogous to the treatment of traditional exports, sales of the tourism-related and miscellaneous export bundles are allowed to respond to changes in competitiveness and to changes in foreign demand conditions. While sales of the two export bundles are allowed to adjust, the composition of each bundle is typically assumed to remain unchanged. That is, if sales of the tourism-related export bundle expand by 10 per cent then exports of the commodities that make up this bundle (for example, Air transport, Entertainment, Hotels and restaurants, and Personal services) all increase by 10 per cent, thereby maintaining their share in the bundle.

O.7 Conclusion

To assess the economy-wide impacts of reductions in the tariff requires analysts to implicitly or explicitly use models. To be useful, these models need to capture the essential elements of the issue under consideration while abstracting from issues of secondary importance.

The Commission recognises the limitations of models in describing the complexity of the real world. The Commission also recognises that any model’s results are conditioned by its structure, data and what it includes as well as what it excludes.

The Commission has assisted in the development of, and has used, a number of large scale economic models to assess changes in government policy, such as tariff cuts. MONASH is the latest such model.

The Commission chose to use MONASH for the automotive industry inquiry because it believes that there is a need for new insights into protection issues.

The industry protection debate has moved on from the broader issue of whether or not protection should be reduced to more specific issues of how quickly protection should be reduced and to what level.

The Commission's view is that MONASH is the best model currently available for assessing the economy-wide impact of tariff reductions. It has a highly disaggregated industry structure that allows resource reallocation effects of tariff cuts to be captured. MONASH also has a flexible structure that can accommodate different theories of how the economy adjusts over time.

The MONASH model is publicly available and this allows public scrutiny and healthy debate on the effects of tariff reductions and the speed at which reductions should proceed. Such transparency aids informed decision-making on a matter which affects the well-being of all Australians.

In this inquiry, the Commission has used the MONASH model in four different, but interlinked, ways. Each use of the model provides valuable insights.

Historical analysis provides an up-to-date database showing the structure of the economy in 1993–94. In addition, it provides information on changes in technology and consumer preferences over the period between 1986–87 and 1993–94. A special feature of historical analysis is that it enables the importance of past tariff changes on the structure of the economy (and industries within it) to be assessed against other factors which shaped the economy over the historical period.

The *baseline simulation* generates a timepath showing expected developments in structure of the economy over time in the absence of a reduction in the automotive tariff. The baseline projection is based on the latest available information forecasting commodity prices and volumes, the macroeconomic scenario, and expected changes in technology and tastes.

Policy simulations generate timepaths showing expected developments in the structure of the economy as a result of lowering the automotive tariff. Different ways of cutting the tariff over time can be simulated. Policy analysis compares the baseline and policy simulations to assess the impact of the cut in the automotive tariff on the structure of the automotive industry and all other industries in the economy. The effects tariff cuts have on production, employment, investment, international trade, wages and returns to capital can all be assessed.

Regional analysis enables the impact of tariff cuts on different States within Australia to be assessed. An automotive tariff cut has differing impacts on States because they have different industrial structures, with some being more reliant on the automotive industry for employment and income. Conversely, other States are more reliant on non-automotive industries. A cut in the automotive tariff may have adverse effects on States which are relatively dependent on automotive production but benefit other States. Regional analysis therefore provides important information for governments about the effects on their economies of the tariff cuts.

P ISSUES IN EVALUATING CHANGES IN THE TARIFF

P.1 Introduction

A number of issues need to be taken into consideration in evaluating the overall impacts on the economy of reducing the tariff on passenger motor vehicles. Evaluating the overall effects means examining the impacts of changing the automotive tariff on the industry itself, other industries, households and government. The assumptions about the relationships between these groups and their responses to changes induced by tariff reductions can affect the overall evaluation. These assumptions are just as relevant in qualitative models (because they are often implied but not explicitly stated) as they are in quantitative models.

Some of these issues have been discussed in detail by others and are only summarised here. Further detail can be found in Vousden (1990), Hazeldine (1989), Dixon (1978), Snape (1977) and Corden (1974). The discussion here does not include all issues, but does attempt to cover those that are considered most relevant to this inquiry.

The main issues that need consideration are:

- What criteria should be used to evaluate tariff reform?
- How is the government sector going to respond to changes in the tariff that may affect its revenue?
- How will the labour market adjust?
- How will investment and capital stock adjust?
- Is investment funded from domestic savings or from international sources?
- Do the demands for exports have a terms of trade effect?
- Are there economies of scale and/or imperfect competition, and how might they affect industry adjustment?
- At what level of disaggregation is the analysis being conducted and what is the nature of other distortions, such as taxes, at that level of disaggregation?
- How does the economy adjust over time to the changes in the tariff?

The explicit and implicit assumptions made regarding these and other questions can influence the impact of changing the tariff on the industry itself and the rest of the economy. These issues are discussed below, together with the approach adopted by the Commission.

P.2 Criteria to evaluate changes in the tariff

There are two issues to be considered when evaluating changes in the tariff. First, the set of criteria to be used to evaluate changes, and second, the definition of each criterion.

Although it is possible to use partial equilibrium analysis to provide insights into the impacts of tariff changes, partial models may not capture many important effects. Two measures commonly used to represent the net effects of change on the community as a whole are GDP and the aggregate level of real consumption. Although these are useful measures of the aggregate impact of changes in the tariff on the economy, they have limitations as measures of community *welfare*, particularly when the changes involve significant changes in transfers between people or firms in the economy. Under certain conditions, real private consumption can be a good measure of welfare. GDP is only a good measure of economic activity.

Aggregate real consumption does not take into account the welfare effects of income redistribution. For example, the automotive tariff is a tax on imported cars, making cars purchased by households and businesses all over Australia more expensive. The industry is concentrated in two regions and the tariff results in significant transfers of income from all over Australia to particular groups in the two regions. Real consumption does not take into account the possible welfare effects of this redistribution.

Another example of the redistribution of income is that a whole range of indirect taxes and subsidies affect industries and households in non-uniform ways. Changes in the structure of industry and consumption may redistribute these transfers.

Given the limitations of real consumption and GDP, it is useful to examine changes in the tariff using a number of criteria or measures. Other measures include the impacts on output and employment for States and industries over time.

The Commission chose the MONASH model to quantify the impacts on the economy of changes in the tariff for the automotive industry because it provides:

- aggregate measures of the economy-wide impacts, such as real GDP and real consumption;
- a high level of industry disaggregation, so that the output and employment effects on a large number of industries can be taken into consideration;
- a possible adjustment path of output and employment by industries over time; and
- a regional disaggregation of the possible adjustment by industries over time.

This set of information is currently not available from other models.

P.3 Real consumption and capital stock

In this particular study, real consumption is used as an indicator of the net *welfare* gains to Australians arising from the change in the tariff. In evaluating the impact over a period of time it is important to take into consideration any consequences for current and future consumption arising from the way in which current consumption and investment is being *financed*.

An increase in current consumption can be financed by borrowing rather than increases in current income. In that case, the increase in real consumption would overstate the increase in welfare because it would not take into account the reduction in future consumption when borrowings are repaid.

Consider an example where the decrease in the automotive tariff induces an increase in the capital stock of the economy. This can affect the time profile of real consumption in several ways, depending upon how the extra investment is financed.

One possibility is that Australians finance the investment through savings. This requires them to forego consumption in earlier periods, as they save and invest. Later they receive higher incomes, as returns on capital, and can increase their consumption.

Alternatively, Australia could have borrowed (internationally) or used foreign investment (equity) to finance the increase in capital stock.[1] In this case, real consumption is higher in the earlier periods, compared to the first option, but lower in the later periods. Real consumption is relatively lower in later periods compared to the case when investment is financed by savings. When investment is financed by international borrowings the income generated by

[1] This implies that the marginal rates of saving by households are zero.

capital accrues to foreign investors (as dividends), or is being used by Australians to repay the loans and meet interest payments.

The two alternatives generate different paths for real consumption over time. However, there should be no difference in the present value of real consumption between the two alternatives when evaluated over a period of time sufficient for the adjustments in the economy to stabilise.

The second of the financing assumptions alternative was adopted in this study because it provides an easy way to keep track of the ownership of incremental capital and allows the changes in real consumption to be proportional to changes in current income.

P.4 Real consumption and the government sector

Another way real consumption can be affected by changes in the tariff is the impact on government revenue and the associated response of government.

The reduction in tariff rates directly contributes to a loss in revenue. This is likely to be at least partly offset by an increase in imports because the price of imported cars has decreased relative to the price of cars made in Australia. Another factor that can contribute towards an increase in revenue is an expansion in income and expenditure arising from the reduction in the tariff. This is likely to increase the revenue from other indirect and direct taxes.

If the net change in government revenue is not zero, then it has implications for the interpretation of real consumption as an indicator of welfare.[2] If there were an increase in revenue, then the government would either be reducing its deficit or improving its surplus. Either way this is a form of saving at the expense of current real consumption. The reverse would be true if there were a net decrease in revenue.

There are three ways to take this into account. One is to adjust government expenditure to maintain the level of deficit or surplus at the level prevailing before the tariff reduction. In this case, the indicator of welfare should be real consumption plus government consumption.

2 Welfare should include public consumption (government expenditure on goods and services) as well as real private consumption. However, in this study government expenditure is held constant and does not contribute to a change in welfare. In this way, real consumption can be interpreted as the change in welfare.

The second way is to adjust taxes to maintain the level of deficit or surplus. In this case, it is consumption that adjusts as disposable income decreases or increases.

A third option is to allow the deficit or surplus to vary over the period being studied. However, the present value of the stream of real consumption over the period would need to be adjusted to reflect the fact that in the long run the accumulated debt would need to be financed out of foregone future consumption (that is, higher taxes in the future). Alternatively, the accumulated surplus would allow future real consumption to be increased through reductions in future taxes.

The economy-wide results may differ according to the option chosen. One reason is that the government sector is a labour intensive industry and consumes different intermediate goods compared to the rest of the economy. A second reason is that the choice of taxes (direct or indirect) can affect the relative prices of commodities, capital and labour.

In this study, the Commission has assumed that in each tariff scenario modelled the direct income taxes are adjusted to maintain the government deficit or surplus at the level in each year of the basecase scenario. This assumption, together with the financing assumption described above, allows aggregate real consumption to be used as an indicator of *welfare*.

P.5 Demand for exports and the terms of trade

The nature of the demand functions for exports is another factor that can influence the evaluation of the economy-wide effects of tariff changes. The issue here is whether the world prices of commodities exported by Australia are sensitive to the quantities exported.

In many CGE models of the Australian economy, some sensitivity of the world price to the quantity exported by Australia is assumed. This is usually justified on the grounds that the commodities exported by Australia have attributes that differentiate them from those produced by other countries. Using this argument, Australia does not necessarily require a large market share of a broadly defined commodity to be able to influence the world price of its exports.

Reducing the tariff for motor vehicles leads to a reduction in the cost of producing commodities in Australia. The level of cost reduction depends upon the extent to which motor vehicles are directly and indirectly (through intermediate and capital goods) used by industry, the extent to which imported vehicles are substitutes for domestically produced vehicles and the extent to which real wages capture any efficiency gains.

Reducing the costs of production of export-oriented industries (shifting their supply curves downwards) means they are willing to sell more for a given price. This leads to an increase in the volume of exports by many industries.

If Australia can influence the world price of a commodity, then the increase in exports will cause the world price of a commodity to fall. This reduces Australia's terms of trade and purchasing power for imports, offsetting some of the benefits from reducing the tariff.

The balance of trade may increase or decrease in response to a tariff reduction. Further, in a dynamic model, it may change direction over time as the economy fully adjusts to the tariff change.

The MONASH model assumes that the level of exports of some commodities (for example, wool) are dependent upon their prices. Therefore, the estimated gains from reducing the tariff would be higher if world commodity prices were not sensitive to the quantity of exports by Australia. Further, it is assumed that the nominal exchange rate is fixed (that is, not affected by changes in the tariff) and that the balance of trade is variable.

P.6 Labour and capital markets

The behaviour of labour and capital markets is one issue which is particularly important in determining the gains from tariff reduction.

In many CGE models, two alternative assumptions are used for both labour and capital. In the case of labour, one approach assumes that employment is predetermined and unaffected by the changes in the tariff under consideration and that real pre-tax wages adjust so that firms are on their labour schedules. This is consistent with the macroeconomic concept of the non-accelerating-inflation rate of unemployment (NAIRU).

The alternative approach commonly used is to assume pre-tax real wages are constant and changes in the demand for labour are met by changes in the level of unemployment.

However, it is possible the supply curve for labour is in between these extremes, even in the long run. Higher real wages may induce people to enter the work force, increasing the number of workers in the economy.[3]

In this study, it is assumed in the short run, pre-tax real wages are sticky and employment changes. However, over time real wages are assumed to adjust until the level of employment returns to its level in the basecase. The temporary increase in employment generates extra temporary increases in GDP, household income and real consumption (see Appendix O for more details).

For capital, one approach is to assume that the supply of capital is fixed and that rates of return adjust in response to changes in industries' prospects. This is consistent with a short-run view because it takes time to invest and adjust the quantity of capital.

An alternative view is that the rate of return for an industry is predetermined, for example, through the operation of international capital markets. It is the quantity of capital that adjusts in response to changes in the prospects of industries.

As with labour, if the level of capital increases in response to tariff changes, then so too does real GDP.

In this study, it is assumed that in the short run, the level of capital is fixed, and rates of return vary. However, in the long run, the capital stock adjusts and rates of return revert to their normal levels. This is consistent with capital being internationally mobile in the long run.

The labour and capital markets interact through the possibility of substitution. Because, in the long run, real wages adjust and employment is constant, the capital intensity of the economy increases compared to a situation where real wages had not increased as much and some employment had been created. If employment had been allowed to increase, with a smaller increase in real pre-tax wages, then the overall effects on real GDP would be larger. Further, if both capital and employment are held constant, then the effects on GDP would be smaller.

3 A version of the ORANI model used by the Commission in a number of applications used this assumption (see Dee 1989 for details, and IC 1995f or 1996e for an application).

P.7 Import substitution

One factor that can impact on both the size of gains from tariff reduction and the import competing industry, is the degree of substitutability between the imported and domestically produced goods.

If the domestically produced good does not have attributes that differentiate it from imported goods, then reducing the tariff can cause a significant switch towards imports.

This effect is controlled by the Armington elasticity (Armington 1969, 1970). A high value means that the imported commodity is a close substitute for the domestically-produced good. A reduction in the tariff in such a case would cause a relatively large increase in the market share of imports, with a corresponding decrease in the output of the domestic industry. This effect was illustrated in Appendix M. The reduction in the automotive tariff was estimated to have contributed to a 6 per cent decrease in industry output for an elasticity of 5.2 and an 11.5 per cent decrease in output for an elasticity of 10.

A large elasticity results in relatively large gains as consumers and using industries are able to substitute more easily toward cheaper imports than if a small elasticity is used.

This effect was also illustrated in Appendix M, where for the period 1986–87 to 1993–94, the increase in GDP from reducing the tariff on automotive imports was estimated to be 0.11 per cent and 0.14 per cent for Armington elasticities of 5.2 and 10, respectively.

In this study, it is assumed that the Armington elasticity is 5.2. This is based on a review of empirical research.

The most detailed study of domestic/import substitution elasticities available for Australia is that carried out in the late 1970s by Alaouze, Marsden and Zeitsch.[4] For motor vehicles they obtained a variety of long-run estimates reflecting different definitions of the car industry and different estimating methods. At the input–output level (that is, for MONASH commodity 70), the study produced two long-run estimates: 3.7 and 5.2.[5] Estimates of domestic/import substitution elasticities for manufactured goods centre around 2.[6]

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4 See Alaouze, Marsden and Zeitsch (1977, p. 66), Alaouze (1977a, p. 33) and Alaouze (1977b, p. 40).

5 See Table 3.1 in Alaouze (1977a).

6 This was reconfirmed in a recent study by Menon (1995).

The Commission believes 5.2 is an appropriate value. Others,[7] however, have argued for higher values and if they are correct, the economy-wide gains and impact on the automotive industry estimated in this study are conservative.

P.8 Aggregation and distortions

The economy-wide effects of reducing one specific tariff can be sensitive to the distortions in other sectors. *A priori* however, it is not known whether they compensate or reinforce the direct resource misallocation caused by the tariff.

If reducing an industry-specific tariff encourages an expansion in the activities of sectors that happen to be disadvantaged by other distortions, it can lead to efficiency gains in addition to those associated with the reallocation of resources away from the industry losing the protection. In such a case the tariff reduction helps correct resource misallocation caused by the other distortions. If, however, it encourages an expansion in the activities of other highly protected industries, this can lower the overall gains associated with reducing the tariff. In this case the tariff reduction exacerbates resource misallocation.

Tariff rates and other economic distortions, such as those caused by wholesale taxes and subsidies and indirect taxes on labour and capital, vary between commodities. Further, commodities affected by these distortions may have different cost structures and different elasticities of substitution between imports and domestically produced goods. In this situation, the higher the level of aggregation, the greater the level of aggregation bias and the greater the error in measuring the true impact of the tariff. This is because aggregating industries disguises the differences in the degree of substitutability between groups of imports and domestically produced goods for sub-groups of the commodity and the variations in taxes, subsidies and other distortions between these sub-groups.

This issue has long been recognised — see Dixon (1978), Corden (1975, p.57), (Magee 1972) and Johnson (1960). More recently, Arce and Reinert (1994) and Wigle (1988) have shown how US and Canadian estimates of the benefits of tariff reduction may be biased downwards because of model aggregations that fail to capture this effect.

MONASH is the most disaggregated model of the Australian economy currently available. In its standard form it contains 112 industries and 115 commodities.

7 Ms Christine Gallus, MP (sub. 157) and Mr Michael Cronin (sub. 139).

The automotive sector is represented as a single industry,[8] producing a single commodity bundle, automobiles and parts, composed of all types of automotive products.

P.8.1 Disaggregation of the automotive industry and its impact on the measured effects of tariff reductions

In response to a number of submissions — Ford (sub. 107), GMH (sub. 138), Cronin (sub. 139) and the Centre for International Economics (in AAA sub. 126) — the Commission analysed whether dividing the automotive industry in the MONASH model into sub-industries would affect the estimates of the gains from reducing the tariff. The submissions pointed out that, because of the export facilitation scheme (EFS) and by-law exemptions, automotive assemblers and component makers face tariff rates that are different to those paid by buyers of after-market parts. The estimates of the impact of reducing the tariff may be affected by whether or not this is taken into account.

The Commission investigated whether it was worth dividing the automotive industry into automotive assemblers, component makers, other producers of automotive products and applying the appropriate tariff rate to each industry and purchaser. It found that this had a marginal effect on the results.

The 'Motor vehicles and parts' industry (ANZSIC 281) in the MONASH model is divided by ABS into five sub-industries: Automotive vehicle assembly (2811), Bodies and caravans (2812), Electrical and instruments (2813), Components (2819), and other road vehicles (2829). Each sub-industry produces a different commodity. For these commodities, the tariff is applied at different rates on the FOB value of imports. This disaggregation is not appropriate for analysing the impact of the tariff.

The tariff rate applied depends on who purchases the imported commodities. Imported automobiles and parts used by the automotive industry as intermediate goods attract a different tariff rate to those imported for after-market sales (repairs). Also, parts of the corresponding commodity imports do not compete with local producers and are subject to the general tariff of 5 per cent.

A more appropriate disaggregation of the sector follows differences in rates paid on corresponding commodities. Table P.1 is an illustrative disaggregation of the imports of Motor vehicle and parts. The top half of the table shows the value of flows of automotive imports according to users. The lower half shows

8 The Motor vehicle and parts industry comprises: Motor vehicle manufacturing, Motor vehicle body manufacturing, Automotive electrical and instrument manufacturing and Automotive components manufacturing n.e.c.

the corresponding FOB tariff rates. Three tariff rates apply to the relevant imports — 22.5, 15 and 5 per cent.

Table P.1: **Illustrative disaggregation of the automotive industry: automotive commodity imports and FOB tariff rates, by use, 1996–97[a]**

	Assembly	*Components*	*Other Vehicles*	*Other industries*	*Consumption*	*Investment*	***Total***
Imports							
	$m	*$m*	*$m*	*$m*	*$m*	*$m*	*$m*
Commodity							
Assembly[b]	3888	0	0	901	1452	912	5825
Components	392	873	0	556	107	0	1927
Other Vehicles[c]	111	0	331	70	386	3025	3923
Tariff rates							
	(%)	*(%)*	*(%*	*(%)*	*(%)*	*(%*	*(%)*
Commodity							
Assembly[b]	22.5	22.5	22.5	22.5	22.5	22.5	na
Components	22.5	22.5	22.5	15.0	15.0	15.0	na
Other Vehicles[c]	5.0	5.0	5.0	5.0	5.0	5.0	na

na not applicable

a Based on MONASH database, 1992–93 ABS input–output commodity and industry files and 1995–96 ABS International Trade, Australia: Magnetic tapes. Tariff rates are for 1 January 1997.

b Includes passenger motor vehicles and elaborate components such as chassis with engines.

c Includes trucks, buses, off road and four wheel drive vehicles, motor vehicle bodies and trailers, caravans and other motorised and non-motorised vehicles.

Source: Commission estimates

The 5 per cent tariff applies to non-competing imports, such as trucks and other commercial vehicles, which make up around 34 per cent of the total value of automotive imports. The 15 per cent tariff applies to after-market sales of components. This represents a small share of the value of automotive imports (around 6 per cent). The tariff that applies to the vast majority of imports is 22.5 per cent. Therefore, changes in this last tariff can be expected to have the greatest impact on the sub-industries that make up Motor vehicles and parts.

The MONASH database was slightly modified to account for the non-competing part of imports (mainly trucks and commercial vehicles that are subject to the general tariff rate). The remainder of imports were subject to the tariff structure shown in Table P.1.

The effects of the 15 per cent by-law allowance on the industry are captured as a compensating subsidy to the assembly industry.

The value of the subsidy each year is calculated in two parts. First, the basic value of domestically produced Motor vehicles and parts is multiplied by a fraction designating the share of production that qualifies for the by-law allowance.[9] Second, the number calculated in the first step is then multiplied by the aggregate tariff rate applying to Motor vehicles and parts.

In an attempt to account for different tariff rates, GMH (sub. 138) split the automotive industry in the AE–CGE model into three sub-industries; Assembly, Components and Other. (The last category includes commercial vehicles, four wheel drives, trucks, ambulances, fire-engines and parts for these vehicles; these are aggregated with Other machinery and equipment). Table P.2 shows the effects on the Assembly and Components industries of:

- reducing the tariff on assembled vehicles and components after 2000 by 2.5 percentage points a year to 5 per cent by 2004;
- allowing the EFS to expire in 2000; and
- continuing the 15 per cent duty free entitlement scheme.[10]

As shown, the modelled reforms have approximately the same effect on both sub-industries. The disaggregation had little effect on the results of the AE–CGE model, and aggregating these industries would not significantly affect the estimated impacts of implementing the reforms.

Given that disaggregating did not significantly affect the model's results, and that this is supported by GMH's modelling, the Commission used a single aggregate commodity, Motor vehicles and parts, to assess the impact of tariff reductions.

9 The fraction's value of 0.06 reflects that the by-law allowance applies to imports up to 15 per cent of the value of output of the automotive assembly industry and automotive assembly is about 40 per cent of the Automotive vehicles and parts industry.

10 The effects on the 'Other machinery and equipment' industry were not reported by GMH.

Table P.2: **GMH results showing the long run impact on the assembly and components industries of a change in government assistance**[a] (per cent[b])

	Assembly industry	*Components industry*
Impact on industry		
Domestic supply to domestic market	-23.16	-25.95
Imports	14.97	19.86
Exports	-23.14	-26.24
Total domestic production	-23.16	-25.98
Domestic prices	-5.67	-4.51
Employment	-23.21	-26.02
Capital stock	-22.93	-25.75

a The assistance change involves reducing the tariff on assembled vehicles and components after 2000 by 2.5 percentage points a year to 5 per cent by 2004; allowing the EFS to expire in 2000; and continuing the 15 per cent duty free entitlement scheme.

b The percentage changes refer to the difference between the situation where the change in assistance is implemented and that where it is not. For example, the first number in the 'Assembly industry' column, shows the effect of implementing the change in assistance was to decrease this industry's output by 23 per cent.

Source: GMH (sub. 138), Table 4.2 and Table 4.3, p. 22

P.9 Economies of scale

Economies of scale arise in situations where fixed costs are a large proportion of total costs. As the volume of production increases, average fixed cost and average total cost decrease. There are many possible explanations for economies of scale and imperfect competition. This section focuses on those aspects considered most relevant to the automotive industry.

In the automotive industry, the design and development of a specific model of car is a fixed cost. Other fixed costs include the tooling of machinery and training of workers in preparation for production of the new model.

Economies of scale are an important characteristic of the automotive industry. Firms in the Australian automotive industry need to be able to produce and sell a sufficiently large volume to capture most of the economies of scale.

This section briefly explores each of these issues and examines why, including product differentiation, economies of scale and imperfect competition, affects estimates of the economy-wide impact of tariff reductions. Further discussion can found in Smith (1994), Hertel and Lanclos (1994), Vousden (1990), Hazeldine (1989), Helpman and Krugman (1985), Lancaster (1984, 1991), Snape (1977) and Corden (1974, 1975).

P.9.1 Product differentiation, economies of scale and imperfect competition

The population consists of consumers with diverse levels of income and preferences. These give rise to demands for cars with different characteristics. Producers try to meet these demands, giving rise to product differentiation.

Product differentiation gives producers some degree of market power. By distinguishing its product from those of competitors', a producer is able to capture that slice of the market that prefers its product's characteristics over those of its competitors, and has some discretion with regard to price. The degree of market power is conditioned by the extent to which one product can be substituted for another and the market share of each.

If two or more products are highly substitutable, then the pricing decisions of firms producing each product will be strongly conditioned by what their competitors do. A manufacturer attempting to raise prices will lose sales as consumers switch to close substitutes. If other products are poor substitutes, then a manufacturer has more discretion with respect to price.

One source of fixed costs is the development of a differentiated good. This is especially so in the automotive industry, where the costs associated with designing a model, and the production process to manufacture it, are large. By increasing the production volume of each model, automotive assemblers and component makers are able to reduce their average cost of production.

P.9.2 Modelling economies of scale and imperfect competition

In any economic model, the degree of substitutability between products, the extent of economies of scale, and the ease of entry and exit affect the results generated.

When economies of scale exist, the gains from reducing the tariff can be relatively large when imported cars are close substitutes for domestically produced cars, and domestic cars are close substitutes for each other. Reducing the tariff can result in domestic industry consolidation (some firms reduce the number of product lines and increase the volumes of others or even exit the industry). The demand for both imported and other domestically produced cars increases. For the remaining domestic producers, production runs increase and average costs fall. This result has been illustrated in empirical studies (Dixon 1978; Harris 1984; Wigle 1988; Abayasiri-Silva and Horridge 1995).

Constant returns to scale and perfect competition are typically used in CGE models, such as MONASH. These assumptions make the models simple to construct and solve and the theoretical properties are well understood. However, results using these assumptions may significantly understate the gains from reducing the tariff if economies of scale and product differentiation are present. To explore this, a simulation incorporating economies of scale and product differentiation was undertaken.

The Commission assumed there were economies of scale and reducing the tariff would lead to a reduction in the number of models manufactured in Australia. Some customers who were no longer able to purchase their preferred model, switched to another Australian model, giving this a higher level of output. The Commission analysis included consideration of firms' location. The results of this modelling are reported in Appendix N.

P.10 Rent seeking

Pre-existing tariffs may create *rents* (that is, income above that which is necessary to induce production). Industries will spend considerable resources in trying to capture such rents through political lobbying or extensive public relations programmes. The resources spent in trying to capture these rents are generally considered to be wasted, because they are not devoted to increasing the productive capacity and wealth of the nation, but merely redistributing existing wealth. Krueger (1974) referred to this lobbying activity as 'rent-seeking'.

To the extent that rent-seeking takes place, but is not included in models, the benefits of reducing the tariff are understated.

P.11 Dynamic efficiency

Tariff reductions increase competition experienced by manufacturers of import competing commodities. This competition can provide incentives for the domestic producers to explore new market opportunities, implement innovative ways of doing business, improve their efficiency and lower their cost of production. [11]

The benefit arising from these forces is often termed the *dynamic* efficiency gain from tariff reduction. Corden (1975, pp. 81–83) states that these *dynamic* benefits are thought to be large and are not usually captured in measures

[11] Following Leibenstein (1966), this managerial effect is referred to as 'X-efficiency'. Corden (1974, pp. 224–231) and Martin (1978) discuss how X-efficiency affects the measurement of the costs of the tariff.

showing the benefits of tariff reductions. As such, the estimated benefits of reducing the tariff is likely to be understated. Chapter 8 analyses participants' views on the dynamic efficiency impact of automotive tariff reductions since 1984.

In the study undertaken for this inquiry, there is no assumption that there is an increase in efficiency associated with reductions in the tariff. In the basecase there are improvements in productivity over time, but the same improvements are assumed in each tariff scenario.

To the extent that Australian car producers improve their efficiency as the tariff is reduced, this study underestimates the gains to the economy from reducing the tariff.

P.12 Adjustment over time

In making their decisions, governments are likely to be interested in the long-run impact of changes in the tariff, along with its transitional impact over time. Any change in assistance will induce some adjustment and economic restructuring. This involves the creation of jobs and business opportunities in some industries, and the loss of jobs, market share and profitability in others. This adjustment needs to be assessed against the general level of structural change taking place in the economy, and industry.

The length of the adjustment process and the relative size of disruption it causes are important considerations for governments trying to develop policy options that take into account any adjustment issues that may arise.

In the MONASH model, the path of adjustment is affected by the rate the tariff is reduced, and the operation of the labour and capital markets (described in Appendix O). Most of the benefits from reducing the tariff are achieved within five years of the tariff change. This is primarily driven by the time taken for factor markets to adjust.

There may be some adjustment costs induced by tariff reduction — such as job search, retraining of displaced workers and interstate migration — which are not taken into account. To the extent that these are not included, the gains from reducing the tariff are overstated. However, these will be partially offset by a lessening of such costs for those who gain jobs in industries benefiting from the tariff cut.

Research on US tariff reductions (Baldwin, Mutti and Richardson 1980) suggests that, in aggregate, adjustment costs are small relative to the benefits gained, but adjustment costs in particular industries may be quite high.

Leamer (1980), in a theoretical study, shows that once adjustment costs are taken into account, pre-announced, gradual tariff reduction *may* be the least cost form of implementation. This is because workers and capital owners, anticipating the changes in the tariff, have time to switch from one industry to another with relatively little disruption (such as periods of unemployment).

The key conclusion drawn from these studies is that adjustment costs appear to be small relative to the economy-wide benefits from tariff reductions. This is particularly so when tariff reductions are phased in over time and are anticipated, when they are accompanied by economic growth, when there is inter-industry mobility of labour and capital, and when factor prices are flexible.

P.13 Regional disaggregation

In evaluating different options to reduce the tariff, it is important to consider the regional impacts. That is, how the gains are distributed between State economies and between industries.

There are two alternatives for modelling the regional consequences of a change in economic circumstances (for example, a change in the tariff). One approach, commonly referred to as the *tops-down* approach, is to calculate the effects of the change in economic circumstances on the national economy first and then map these into regions. The alternative approach, commonly referred to as *bottoms-up*, is to model agent behaviour at the regional rather than national level and to calculate the national effects by aggregating the regional effects.

An example of the *bottoms-up* approach is MONASH-MRF (Peter et al. 1996). MONASH-MRF is a multi-region model which consists of 8 regional models (one for each state and territory) linked by interregional flows in commodities, factors (labour and capital) and population.

Multi-region models have intensive regional data requirements. For this reason they are typically more aggregated than *tops-down* models (for example, MONASH-MRF distinguishes 13 industrial sectors in each state compared to 113 in MONASH). In addition, the lack of data on inter-regional resource flows often makes it necessary to make informed assumptions. The key advantage of multi-region models is that they provide scope for examining the implications of changes in economic circumstances that originate at the regional level. For example, one such model has provided scope for examining the implications for the national economy and for each of the states and territories of a road infrastructure project in Victoria (see Naqvi and Peter 1996).

Since industry protection is a national policy and because the automotive industry's output is highly tradeable, the Commission chose to use the MONASH *tops-down* approach to analyse the regional effects of changes in protection to the automotive industry. Given the national nature of the policy and the international nature of the industry the Commission believes there is little to be gained from a regional model with minimal industry disaggregation.

P.14 Summary

Using models to analyse the impact of tariff reductions provides insights into understanding the issues and assists in making an informed judgement about the impact.

The impact on the economy of reducing the tariff depends upon the assumptions made about relationships between groups in the economy and their response to the changes induced by the tariff reductions.

The Commission recognises that using different assumptions may lead to different results. However, in general, the assumptions used by the Commission in this study have been conservative and the estimated economy-wide gains, and impact on the automotive industry, from reducing the tariff tend to be conservative.

Q LABOUR MARKET PROGRAMS

Q.1 Introduction

Labour market programs (LMPs) are schemes to assist the unemployed, or those likely to become unemployed, by providing services or subsidies which will help them to find a permanent job. They have become more prominent in many countries over the last two decades, and are used to some extent in all OECD countries. The OECD (1990) identified three main policy objectives of LMPs:

> – To develop human resources and adjust manpower resources to structural changes with a view to fostering economic growth;
>
> – To improve both employability of and opportunities for disadvantaged groups, and thus contribute to social equity;
>
> – To improve the trade-off between inflation and unemployment by stabilizing employment during the cyclical downswing and by removing labour-market bottle-necks during the upswing. (p. 11)

LMPs are often targeted at long term unemployed people, young people, workers in particular industries or particular regions, or other disadvantaged job seekers. In Australia, programs have generally aimed to 'improve the income and job prospects of the long term unemployed and other disadvantaged job seekers' (Stretton and Chapman 1990).

The programs discussed here do not attempt to stop or slow the natural industry adjustment process by supporting firms or industries which are in financial distress. Government intervention to support such firms may prevent some job loss in the short term, but it is frequently unsustainable and the cost per worker is often very high in comparison to other labour market programs. This is not to say that LMPs cannot be targeted to employees made redundant in specific regions or in a particular plant closure.

Q.2 Types of labour market programs

There are four main types of programs implemented by governments seeking to assist the unemployed or reduce the unemployment rate through labour market measures:

- job broking and job search assistance;

- training;
- wage subsidies to private employers; and
- direct job creation.

Job broking programs generally help unemployed people to locate job vacancies and opportunities, and to improve their ability to apply for jobs. They may involve offering job matching services to businesses that are searching for new employees and providing short lists of their clients who may be suitable for each position. These programs can improve the efficiency of the matching process between job vacancies and job seekers.

Training programs are offered to unemployed people in many countries. The training provided may range from general 'life' training (for example, personal development courses and job search training), through general skills training (for example, English as a second language), to specific trade training. Provision of such training aims to increase the employability of the unemployed and reduce the skills atrophy which can occur if a person experiences sustained unemployment.

Wage subsidies to private employers are generally only offered to businesses that employee individuals from a target group (for example, the long-term unemployed) and involve payments for a fixed period. They aim to get targeted individuals back into paid work, increasing their self-esteem, reducing skills atrophy or reinforcing skills learnt in training programs, and providing recent work experience — all of which increase employability in the open labour market. They also often aim to increase the overall level of employment.

Direct job creation involves 'the government funding works programs or other public expenditures which employ the unemployed or potentially unemployed' (Stretton and Chapman 1990). The aims are much the same as for wage subsidy schemes, and these programs are also usually targeted to particular groups of unemployed people.

Government programs generally combine two or more of these schemes, often linking training with wage subsidies or job broking programs in order to reinforce the benefit of training.

Labour market programs can also be undertaken by companies which are downsizing or closing plants. These can be in partnership with governments or entirely private schemes, and usually involve job search assistance and provision of training. One such example in Australia is Nissan's contribution to adjustment assistance for its retrenched employees in Clayton (see Box 12.2 in Chapter 12). Another example comes from the US, where Ford and the United

Auto Workers Union combined to provide adjustment assistance to the employees of Ford's San Jose plant when it closed in 1982 (see Box 12.5 in Chapter 12).

Q.3 Australia's past and current labour market programs

Labour market programs in Australia are generally offered by the Commonwealth Government, through the Department of Employment, Education, Training and Youth Affairs (DEETYA), formerly the Department of Employment, Education and Training (DEET). For the most part, these are generally available programs, offered to unemployed people on the basis of their individual characteristics. However, industry-specific programs are sometimes offered, such as the Labour Adjustment Packages for various industries.

The following section looks at the changes in general labour market programs available in Australia up to 1996. This is followed by a discussion of the programs offered in 1996–97 and further changes to be made from December 1997. The PMV Labour Adjustment Package — a specific program for the automotive industry which operated until recently, and is still assisting a number of retrenchees from the industry — is then briefly described.

Q.3.1 History of general labour market programs

Job broking, training and wage subsidy schemes have been elements of LMPs since their introduction in the early-1970s. Direct job creation programs were a significant element of the Government's LMPs in 1974–75 and 1975–76, and again in the period 1982–83 to 1987–88 (Stretton and Chapman 1990). The 'work for the dole' scheme which is currently under debate is a similar type of LMP, the main difference being the way that participants are categorised and paid.

LMPs were initially loosely targeted and relatively generous, but by the mid-1970s the decision to tighten fiscal policy saw expenditure cut and guidelines for programs become much stricter. Between 1976 and 1983, the unemployment rate in Australia increased from 4.7 per cent to over 10 per cent, falling to 7.9 per cent by 1985. Australia's experience with LMPs over this period 'was similar to the general OECD experience of there being more programs but considerable ambiguity about their role and effectiveness' (Stretton and Chapman 1990, p. 21).

The proportion of LMP funds (as classified by Stretton and Chapman 1990[1]) which was spent on direct job creation fell from over 50 per cent in 1983–84 and 1984–85 to almost 18 per cent in 1987–88 and zero thereafter. Meanwhile, training for the unemployed increased from 11 per cent to nearly 36 per cent of expenditure by 1989–90. Wage subsidies were maintained at about the same proportion of expenditure until 1988–89, when they dropped from around 19 per cent to around 12 per cent, increasing to 14 per cent in 1989–90.

A major inquiry into LMPs, the Kirby Committee, reported to the Government in 1985, stating that the Government had tended to overestimate the potential of LMPs to increase overall employment — an objective that should be pursued through macroeconomic policies. The Committee said, however, that LMPs could assist the most disadvantaged in the labour market, especially if integrated with other policies. The Kirby Committee's recommendations guided LMP policy in the period 1985 to 1990, the main features of which were:

- a closer integration of labour market programs and income support policies;
- a greater emphasis on assistance through training rather than short term job creation;
- a continued targeting of programs towards the long-term unemployed and the disadvantaged;
- the integration of individual labour market programs to reduce the number of programs but increase the flexibility of their delivery; and
- a tentative attempt to integrate labour market programs and industry policy. (Stretton and Chapman 1990, p. 27)

The practice of having separate programs for youth and adults was stopped over this period and JobTrain and JobStart were introduced to provide training and wage subsidies, respectively, to all long-term unemployed and disadvantaged clients. Several community-based programs were amalgamated into the SkillShare scheme in 1988–89. In 1989–90, JobTrain, JobStart and the Job Search Program were combined as an integrated program. Stretton and Chapman (1990) commented that:

> This aggregation gives CES managers greater flexibility in the delivery of LMP. They receive a sum of money to assist the long-term unemployed and can choose a specific avenue which best suits the needs of the client and the state of the local labour market without concerns regarding expenditure limits on each program. It also allows greater opportunity to offer a package of support involving a number of different programs to meet the specific needs of the individual. (p. 29)

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1 This includes funds for training for the employed, training for the unemployed, wage subsidies, direct job creation, Aboriginal education and training and 'other'. It does not appear to include funds for job broking programs.

The Active Employment Strategy was introduced in 1990, taking effect from July 1991. The changes mainly related to the delivery of programs, further increasing the integration of welfare and labour market policies. It replaced unemployment benefits with a JobStart allowance for all persons who had been unemployed for less than 12 months, and a NewStart allowance for the long-term unemployed.

In May 1994, the Keating Government announced the introduction of *Working Nation*, a four year program aimed at reducing unemployment and fostering economic growth. The target was to reduce unemployment to 5 per cent by 2000. The package included strategies for industry and regional development, changes to LMPs and ‘the development of a more skilled and flexible labour force’ (DEETYA 1996a, p. v).

Equity was a very important objective of *Working Nation* and many of the changes to LMPs were specifically directed toward further assisting those who were long-term unemployed or otherwise disadvantaged in the labour market. The major changes introduced in 1994 included:

- the introduction of an early intervention strategy to identify those most at risk of becoming long-term unemployed;
- intensive personalised case management, especially for those who had been on unemployment benefits for 18 months or more, and those identified as being at risk of becoming long-term unemployed;
- intensive assistance for people under the age of 18 in their search for suitable work, training or education through the Youth Training Initiative;
- an expansion of the entry level training system;
- improved employer servicing through a number of channels; and
- increased competition for the delivery of case management services (DEETYA 1996a).

Working Nation changed the role of the Commonwealth Employment Service (CES). While it remained primarily a job broking and information service, it was also given the responsibility of identifying those job seekers at risk of long-term unemployment.

A separate agency was established within DEETYA, as a public provider of case management services, called Employee Assistance Australia (EAA). Case management was also undertaken by Contracted Case Managers from outside DEETYA. The Employment Services Regulatory Authority (ESRA) was created to ‘establish and regulate a competitive environment for case management, and purchase case management from private, non-profit and other government providers' (DEETYA 1996a, p. 15).

Case managers retained flexibility in the delivery of LMPs, with general and specific training programs available, a wage subsidy scheme and allowance for brokered programs involving placement with a private sector employer for a fixed period of training and work experience.

Some of the programs introduced under *Working Nation* are still in place. However, many programs have been amalgamated or abolished, and there have been changes in implementation. The Commonwealth Government plans further changes to LMPs, which will be fully implemented by December 1997. There will be a transition period from October 1996 to December 1997, during which the recommendations of the Commonwealth Employment Service Advisory Committee's 1995 review will be implemented.

Q.3.2 Programs in place in 1996–97

The main LMPs for 1996–97 are listed under Programme 4, Employment, in DEETYA's program listing. This Programme includes six sub-programmes:

- Job Seeker Registration, Assessment and Referral;
- Employment Participation;
- Employer and Industry Servicing;
- Case Management Services;
- Aboriginal Employment and Training Assistance; and
- Case Management Processes (ESRA).

Funding for the Programme was cut from over $2.7 billion in 1995–96 to an estimated $2.1 billion in 1996–97 (Commonwealth Government 1996).

Job Seeker Registration, Assessment and Referral

The CES is responsible for the Job Seeker Registration, Assessment and Referral sub-programme, which covers: registering job seekers; job brokerage; administering employment, training and job experience programs; placing job seekers in suitable employment, training or job experience programs; case managing long-term unemployed job seekers and those at high risk of long-term unemployment; collecting, analysing and providing information about the labour market; and administering student assistance programs.

Employment Participation

The Employment Participation sub-programme aims to ‘contribute to the reduction in long-term unemployment by providing cost-effective labour market programmes’ (DEETYA 1996b). It provides assistance under three headings:

- Employer Incentives;
- Training for Employment; and
- Job Seeker Preparation and Support.

Assistance is targeted according to the needs of three broad groups of clients: job ready clients; those at ‘high risk’ of becoming long-term unemployed; and the long-term or very long-term unemployed.

Employer Incentives includes a wage subsidy program (JobStart) and a brokered 20 week work experience and training program (Special Employer Support) ‘with an employer who has the intention and capacity to provide employment at the end of the placement’ (DEETYA 1996b).

The Training for Employment section contracts courses or provides places in existing courses which offer vocational skills directly related to specific employment opportunities. It also provides for training in English as a second language and a community-based training program combining vocational and non-vocational training and assistance (SkillShare).

Job Seeker Preparation and Support provides: job search assistance (training and access to facilities including job clubs); preparatory training and assistance (including English as a second language and literacy and numeracy training); assessment services, with referral to appropriate training or assistance; interpreter services; travel assistance for participation in LMPs or job search; and ancillary assistance (help to meet the cost of entry to, and remaining in, employment or training).

Employer and Industry Servicing

Employer and Industry Servicing covers two areas, Employer Incentives and Enterprise and Adjustment Assistance. The Employer Incentives element provides support for apprenticeships and traineeships, assists unemployed apprentices or trainees to attend approved training facilities to complete the theoretical section of their apprenticeship or traineeship, and provides short-term skills training to employed and suitably qualified unemployed people.

The Enterprise and Adjustment Assistance scheme provides a range of industry- or firm-specific measures aimed at increasing or maintaining employment, or assisting workers affected by industry adjustment. One of these is the Forest

Industry Labour Adjustment Package — a program aimed specifically at assisting workers displaced from the forest industry. It is the only remaining industry-specific Labour Adjustment Package of several that were introduced in the early-1990s.

Case Management Services and Processes

Case management services are currently undertaken by EAA and Contracted Case Managers, following referral of clients by the CES. As discussed above, case managers tailor support to job seekers, using the support measures provided under the Employment Participation sub-programme. ESRA is responsible for regulating the case management system, promoting competition between service providers, monitoring and evaluating the operation of the system, and reporting to the Minister on the system's operation.

Q.3.3 Changes in LMPs from December 1997

The Government stated that the changes it is making to labour market programs are based on the results of research both in Australia and internationally (much of which is discussed in Sections Q.4 and Q.5). From this it established six general principles to be observed in designing labour market assistance:

1. The assistance provided to jobseekers should be based on their individual needs and their capacity to benefit from it in terms of achieving a sustainable employment outcome.
2. Providers should have access to flexible forms of assistance that fit the needs of jobseekers.
3. The incentive framework should reward providers of labour market assistance primarily for placing jobseekers in real jobs, with additional incentives for placing those most in need.
4. A competitive market for employment placement services should separate purchaser from providers and ensure that providers operate on the basis of competitive neutrality.
5. Conditions for payment of income support for unemployed people should be linked closely with active employment assistance measures.
6. Jobseekers and employers should be able to receive high quality and streamlined service from the agencies and providers with which they interact. (Vanstone 1996b, pp. 11–13)

The most substantial change in the provision of LMPs to take effect from December 1997 will be the integration of some functions of the CES with those of the Department of Social Security. This will be implemented through the establishment of a single delivery network of offices providing income support, student assistance and employment services. These offices will also be responsible for identifying those who are long-term unemployed, at risk of long-term unemployment.

From December 1997, there will be greater competition between public and private providers of employment placement services (employment placement enterprises or EPEs). EPEs will 'provide job seekers with labour exchange services, job search assistance and intensive employment assistance' (DEETYA 1996b, p. 87). They will compete for funding from DEETYA and this will be awarded on the basis of performance, quality and capacity to provide services to unemployed people. EPEs will have a range of training and wage subsidy options at their disposal to assist job seekers.

The performance of EPEs will be judged on the basis of job seekers gaining an employment outcome such as a full time job, apprenticeship or traineeship (a primary outcome), or an ongoing placement in accredited education and training (a secondary outcome). Fees will be paid to EPEs on a per client basis, with an initial up-front service fee of 30 per cent of the total primary outcome payment. Another payment will be made after 13 weeks, based on achievement of either a primary or secondary outcome — 40 per cent of primary outcome payment if a primary outcome is achieved and substantially less if a secondary outcome is achieved. After 26 weeks, the final payment is made, which is 30 per cent of the total primary outcome payment if this has been achieved, and substantially less if a secondary outcome has been achieved. (Vanstone 1996b)

There will be three categories of EPE clients:

- job seekers who are newly unemployed but at high risk of long-term unemployment, and long-term unemployed clients with less serious forms of disadvantage;
- more seriously disadvantaged long-term unemployed job seekers; and
- persons with disabilities and Aboriginal and Torres Strait Islander clients who confront multiple barriers to employment.

The total primary outcome payment for the first category of clients is proposed to be $5000, increasing to $7500 for clients in the second category and $10 000 for clients in the third category. Proposed total payments for secondary outcomes are $2500, $3250 and $4000 respectively. (Vanstone 1996b)

The case management arm of the CES (EAA) will be replaced in December 1997 by a new corporatised public provider, which will assume many of the current responsibilities of the CES and EAA. Its employment placement services will compete with other EPEs for funding.

Once the new arrangements for intensive employment assistance are in place, ESRA will be discontinued and DEETYA will assume a purchasing role. Residual regulatory matters will be the responsibility of the Australian Competition and Consumer Commission.

The Government stated that:

> The employment placement market will be funded by pooling or 'cashing out' funds currently used for most LMPs and to deliver services to the unemployed. (Commonwealth Government 1996, p. 73)

However, according to budget forecasts, overall funding for LMPs will be cut by approximately $1 billion in 1997–98.

Q.3.4 PMV Labour Adjustment Package

The Labour Adjustment Package (LAP) scheme as a whole evolved from the Labour Adjustment Training Arrangements, which were in place to assist workers retrenched from designated plants from 1982 until 1991. In February 1991, the PMV LAP was introduced to overcome deficiencies of the previous arrangements by: increasing the take-up rate; establishing pre-retrenchment assistance arrangements; and providing a wage subsidy to employers taking on PMV retrenchees. (Bertone and Lambrick 1994)

The main assistance arrangements under the PMV LAP were:

- formal vocational training totalling 52 weeks and/or English language training for 52 weeks;
- wage subsidies for up to 26 weeks for employers engaging retrenched PMV employees (generally unavailable to PMV firms employing retrenchees); and
- relocation assistance for participants moving to a job, to look for work, or to take up formal training (Bertone and Lambrick 1994).

In order to qualify for assistance, retrenchees had to apply for entry to the program and be granted approval within 12 months of their notification of redundancy. However, where retrenchees were not aware of the program or were unable to register within 12 months, the eligibility period was not enforced.

The main advantage of the LAP to PMV retrenchees was the immediate access it provided to programs that were usually only available to the long-term unemployed.

There was substantial consultation with industry parties prior to the establishment of the LAP, and a tripartite advisory committee was established to advise the Minister on delivery of the Package. Liaison officers from the Federation of Vehicle Industry Unions were funded to provide retrenchees with advice on their entitlements. In situations involving major plant closures or restructuring, Enterprise-Based Committees were established to oversee delivery of the LAP on-site (see Box 12.2 in Chapter 12 regarding the assistance provided to retrenched employees of Nissan's Clayton plant). Bertone and Lambrick undertook an evaluation of the PMV LAP on behalf of DEET in 1994 (see Box Q.2).

Q.4 Effects of labour market programs

Labour market programs usually have a number of effects, not only on the unemployed people targeted by the programs, but also on other participants in the labour market and on the workings of the labour market as a whole. The effects can be both immediate and longer term. In addition, program effects and effectiveness can change depending on where the economy is in the business cycle.

Box Q.1 describes some of the effects of labour market policies according to Calmfors (1994). Each of the four program types described above are subject to some or all of these effects.

Job broking programs and job search assistance have the potential to enhance the efficiency of the labour market as a whole if they are addressing a market failure (the lack of availability of information to both job seekers and employers) in an efficient manner. As a general rule, job broking programs are less likely than the other schemes to be targeted to a specific group of unemployed people. However, when they are, the competition effects between targeted and non-targeted job seekers (see Box Q.1) will be more immediate than for training or wage subsidy schemes (Calmfors 1994).

Training creates competition effects between targeted and non-targeted job seekers (see Box Q.1). That is, it improves the employability of the long-term unemployed and others disadvantaged in the labour market, decreasing withdrawal from the labour market and increasing competition in labour supply. Overall, training programs are likely to have the effect of redistributing employment opportunities, rather than creating new employment. They can also have positive productivity effects, if they provide skills that are in demand in the labour market (Stretton and Chapman 1990).

Box Q.1: Effects of labour market policies

Effects on the matching process

LMPs can improve the matching process between employers and job seekers in three ways:

- mismatch between different sub-markets for labour may be eliminated to the extent that the qualifications of job searchers can be better adapted to the structure of labour demand;
- more active search behaviour on the part of job seekers can be promoted; and
- LMPs can substitute for regular work experience in reducing employer uncertainty about the employability of job applicants.

Nevertheless, LMPs can also have ‘locking-in’ effects, reducing the job search of individuals while they are participating in a program.

Effects on the labour force and productivity

LMPs can reduce skills atrophy and the loss of self-esteem, which in turn lead to withdrawal from the labour force. Hence, LMPs can help to maintain labour force participation. This implies that in times of high unemployment, the existence of LMPs may serve to increase or maintain measured unemployment. However, in times of growth, increased labour force participation should improve the efficiency of the job market.

The prevention of skills atrophy and the loss of self esteem and work habits, and programs to improve skill levels, can also serve to maintain or increase the potential productivity of job seekers, and therefore the labour force as a whole.

Competition effects

By increasing the employment opportunities of those disadvantaged in the labour market, LMPs increase the degree of competition in the labour market. This can lead to an increase in the amount of available labour at any given wage. Hence, if wages are flexible downward, the result may be a fall in real wages and an increase in the level of employment.

Substitution effects and deadweight losses

The substitution effect is defined as the extent to which jobs created for a certain category of workers simply replace jobs in other categories, because relative wage costs are changed. The deadweight loss is defined as the hirings from the target group that would have occurred in the absence of the program.

Work-test effects

When the unemployment level is high, it is difficult for agencies to determine whether those receiving unemployment benefits are genuinely interested in work. Willingness to participate in LMPs can provide an indication of whether this is the case, particularly if participation is compulsory for obtaining benefits.

Source: Calmfors (1994).

Wage subsidy schemes have the potential to increase overall employment by effectively lowering the real wages faced by employers. However, there is a danger of substitution effects — that is, employers choosing to hire an eligible person rather than someone who is not part of the target group (perhaps someone who has only been unemployed a short time or who has been out of the labour force). There is also a possibility that some of those assisted by wage subsidy schemes would have found jobs without subsidisation, implying the existence of what Calmfors (1994) describes as deadweight loss effects.

Substitution can also be a problem for direct job creation schemes, as the government work program may employ people from the target group instead of other job seekers (for the same or other projects). Direct job creation can also result in crowding out of private sector investment (and therefore job creation), particularly if it increases government expenditure. Both of these effects can be described as displacement effects, where the extra jobs created as a result of the subsidy have replaced employment elsewhere in the economy.

Q.5 Effectiveness of labour market programs

Many attempts have been made to determine which types of LMP are most effective for given situations, and how effective past LMPs have been in Australia and overseas. Most of these assessments have been made on the basis of how substantially each program has met its objectives and the relative cost of different programs.

The first problem encountered when assessing many programs is that the objectives have not been adequately identified. Not only does this make it difficult to determine whether the program has been effective, but it often leads to problems with implementation, as people who are working together may be working toward different goals. This was one of the problems identified in an evaluation of the *Working Nation* strategy by DEETYA in 1996, which looked at the effectiveness of each of the strategies introduced. The main conclusions of this study are reported in Box Q.3.

Q.5.1 Job broking and job search assistance

A significant determinant of the effectiveness of job broking services is the proportion of job openings that are notified to it. The OECD (1990) noted that this ‘market share’ was estimated at between one in ten and one in three in several countries in the 1980s, although in Sweden (where notification of vacancies was obligatory) two thirds of vacancies were notified.

The OECD (1990) also commented that:

> It has ... seldom been considered desirable for public agencies to concentrate only on the unemployed — an approach which might diminish the status of these agencies in the eyes of employers. (p. 27)

According to the OECD, this is a major reason for the restriction of private employment service activity in many countries — the concern that these would focus on the most employable workers and therefore diminish the value of the public agency to employers.

Job search assistance is generally found to be effective in assisting unemployed people, and is a low-cost form of assistance. The establishment of 'job clubs' — where unemployed people form groups to assist and support one another in their job search activities — has been found to assist some long-term unemployed people by providing a supportive and motivational atmosphere in which to pursue job search activities. Vanstone (1996b) stated that one of the reasons this program has been successful in Australia is that it places responsibility for job search with the job seeker. This allows employers to make some determination of the job seekers level of motivation based in part on 'the enthusiasm of their job search efforts' (p. 35).

Q.5.2 Training programs

Studies have generally found that the effectiveness of training programs for the unemployed depends on the ability to target programs to deliver skills which are in demand in the job market. For example, the OECD (1990) said:

> According to an OECD evaluation panel, a focus on skill shortages is crucial for success. It has been found, for example, that some of the less favourable job-placement results reported in Australia (Labour Adjustment Training Program) and the United States ... were due to a poor match between the training provided and the actual skills profiles in demand. (p. 37)

This element can also be seen in the Ford/UAW Education Development Training Program described in Box 12.5 in Chapter 12. Stretton and Chapman (1990) stated that 'DEET experience with training programs is that shorter courses teaching skills in demand in the labour market are the most fruitful in terms of employment outcomes' (p. 47).

Commentators have also recognised the importance of reinforcing training with work experience soon after the training is completed (OECD 1996b). This prevents both the skills atrophy and the reduction in self esteem which are associated with unemployment. With regard to Australia's JobTrain program, Stretton and Chapman (1990) reported that around half of participants were not in employment or undertaking further education or training three months after completion of their course. However, of the less than 5 per cent of JobTrain participants who undertook JobTrain and JobStart as a linked package in 1988–89, slightly over 70 per cent were in employment three months after completing the program. The Integrated Program implemented in 1989–90 — comprising job search training and JobTrain and JobStart placements — was partly a response to these results.

Q.5.3 Wage subsidy schemes

Wage subsidy schemes have often been successful in terms of providing employment to long-term unemployed people or other disadvantaged job seekers. Stretton and Chapman (1990) said:

> DEET found that 57 per cent of persons who completed or withdrew early from a JobStart placement in 1988–89 were in employment three months later. Almost 80 per cent of those who completed their placement were in employment compared to with 34 per cent of those who failed to finish. The probability of holding a job also increased with age, but appeared not to be affected by duration of unemployment prior to the program. Separate surveys undertaken 5 and 14 months after the end of assistance also found that around 60 per cent of participants were in employment. (p. 40)

Similar results were found for other wage subsidy programs in Australia.

In terms of net job creation, the OECD (1990 and 1996b) stated that studies in a number of countries indicated that between 10 and 20 per cent of subsidised private sector jobs represented net job creation. A DEET evaluation of JobStart between 1985–86 and 1988–89 reported that only 15 per cent of subsidised positions were additional jobs (Stretton and Chapman 1990). The other 80 to 90 per cent, therefore, represent either substitution or deadweight loss effects.

Subsidising the employment of job seekers who would otherwise have found work represents a loss to society. However, the same cannot be said of wage subsidies which result in substituting targeted job seekers for non-targeted workers. For targeted job seekers, placement in a subsidised job increases their future productivity and employability. This reduces the detrimental effects of very long-term unemployment on the individual and society as a whole, and increases the potential productivity of the labour force.

The National Institute of Labour Studies (NILS, sub. 202) added that wage subsidy schemes can also increase the efficiency of the labour market by offsetting employers’ screening costs. NILS said:

> This has the potential benefit of reducing statistical discrimination against individuals who are identified as being part of a designated group [ie the long-term unemployed] and who would not be recruited by employers because of such discrimination. (p. 2)

Q.5.4 Direct job creation

Direct job creation programs, as noted above, can have substitution and other displacement effects, although these tend to be less than for wage subsidy schemes (Stretton and Chapman 1990). Their potential to create new jobs depends on the extent to which the government can limit these effects. Even if new jobs are created, some commentators have questioned the value of these jobs. The OECD (1996b) said that:

> ... since most jobs provided through direct job creation schemes typically have a low marginal product, they should be short in duration and not become a disguised form of unemployment. (p. 13)

However, the creation of new jobs is not the only potential benefit of such schemes. As with wage subsidy schemes, their potential for substituting targeted job seekers for non-targeted workers means that they may have positive effects on the labour market apart from the creation of new jobs. These benefits come from assisting the most disadvantaged in the labour market to find work or, at least, to maintain attachment to the labour market.

Stretton and Chapman (1990), however, reported a far lower employment rate after completing the program for participants in the Community Employment Program than for those accessing JobStart subsidies. The net impact of the Community Employment Program was estimated to be around nine percentage points, compared to a net impact of between 26 and 38 percentage points for JobStart (depending on prior duration of unemployment).

The OECD (1996b) also said that direct job creation in the public sector 'has been of little success in helping unemployed people get permanent jobs in the open labour market' (p. 11). One reason for this may be that participants in direct job creation schemes must search for a new job once the project is completed, while those in wage subsidy programs may be able to retain the same job without subsidies. In addition, skills acquired in such programs may be of limited value in the open labour market.

Direct job creation schemes have also suffered from an inability to control costs in a number of countries (for example, Australia, the Netherlands, New Zealand and the United States). One aspect affecting the cost of such programs is the labour-intensity of the project (or the degree of capital expenditure required per worker). The international trend in countries maintaining direct job creation programs has been to increase labour intensity, and these programs have moved away from construction of public works toward service jobs and maintenance of local infrastructure. Many countries, including Australia, have phased out such schemes because of concerns over efficiency and cost. (OECD 1990)

Another aspect of direct job creation schemes that was raised by NILS (sub. 202) is the fact that they are often compulsory. Such schemes could be expected to have greater value to prospective employers if they are voluntary. NILS said:

> ... since participation in these schemes is often compulsory for identified individuals, participation in these schemes does not confer positive signalling devices for potential private sector employers. Indeed, the reverse may be true with participation in such schemes scarring participants by creating a stigma in the eyes of private sector employers. As a consequence, relatively low levels of placements in continuing jobs (compared to wage subsidy schemes) are common with public sector job creation. (sub. 202, p. 3)

On the comparison between wage subsidies and direct job creation programs, Chapman (1997) said:

> ... wage subsidy programs have relatively high deadweight and displacement costs, but relatively high effectiveness consequences. On the other hand, public sector job creation schemes are much more likely to have low deadweight and displacement costs, but low effectiveness parameters. As well, the initial subsidies involved differ significantly. It follows that there can be no *a priori* presumption about which approach is likely to be superior in terms of the net job creation per dollar spent. (p. 8)

Q.5.5 The effect of the state of the labour market

Stretton and Chapman (1990) discussed the effects of differing levels of labour demand on the effectiveness of labour market programs. Their main conclusions were:

1. The effectiveness of labour market programs in creating new jobs is relatively low during an economic downturn. In particular, employers are less likely to hire job seekers on wage subsidy schemes due to a reduction in turnover and increased competition from non-targeted job seekers.
2. The potential of LMPs to improve efficiency in the labour market is likely to be lower during recession than in periods of growth, due to the increased average skills or quality of the unemployed. This implies that employers will find it easier to fill vacancies and there will be fewer production bottlenecks due to skill shortages when the economy grows.
3. From labour market analysis in the US, it is apparent that jobs in the manufacturing sector are likely to provide the greatest benefits in terms of on-the-job training. However, these are also the most cyclically sensitive

industries. Hence, even when targeting of LMPs is effective in a recession, the long-run benefits to the individual are likely to be reduced.

4. As noted above, the effectiveness of targeted short-term training programs is substantially increased when trainees have the opportunity to consolidate skills through work experience or on-the-job training. This is less likely during a recession.

Q.5.6 Evaluations of Australia's past programs

In 1994, DEET released an evaluation of the PMV LAP. Many of its findings reflected the general points made above — there was a high deadweight loss from wage subsidy and relocation assistance elements, and training was most successful when targeted to job vacancies and when programs were selected through personal motivation (see Box Q.2).

Box Q.2: **Highlights of PMV LAP evaluation study**

The PMV LAP evaluation study concluded that the effectiveness of the program was partly determined by the characteristics of the individual client. Retrenchees from a blue-collar, non-English speaking background (NESB) were likely to face persistent disadvantage, both in terms of their access to the program and then through their inability to effectively maximise opportunities under it.

Information supply and management

Regarding the supply elements of the LAP, the study found that dedicated elements, such as the Nissan Assistance Centre and the FVIU Liaison Officers, functioned well, but problems arose when trying to disseminate information through the wider CES/DEET network. The report was critical of the lack of a dedicated information management system, which meant that FVIU Liaison Officers were excluded from access to information because of privacy provisions, and client follow-up was ad hoc.

Clients from non-English speaking backgrounds

The report criticised the mono-cultural nature of the information management system, given the high percentage of NESB employees. As well as removing the mono-cultural nature of the information management system, the report recommended that other bilingual resources be available to the program, in particular that FVIU Liaison Officers should be able to call on translators to improve their communication with clients. It also said that facilitating support group activity (such as job clubs) in particular NESB communities should be considered.

... continued

Box Q.2: **Highlights of PMV LAP evaluation study** (continued)

Wage subsidy and relocation assistance elements

The study found that these elements helped mainly a narrow range of clients — and these were generally the clients who least needed assistance. It noted that the automotive industry is an important source of re-employment for PMV retrenchees. It therefore questioned whether it was appropriate to make it more difficult to receive a wage subsidy for employment in the automotive industry.

An option canvassed in the report was to establish a sliding scale of entitlements under this element of the scheme, with relatively greater assistance for those leaving PMV jobs in the machine operator and labourer categories.

Training schemes and vocational guidance

The study found that successful training pathways were characterised by the predominance of white collar workers and by the personal motivation behind their training selections. It found that advice offered by the Jobcentre/CES on training was limited and often appeared to be inappropriate.

The study questioned whether retrenchees who had commenced manufacturing-oriented training were being sufficiently encouraged to continue these studies. It considered that industry parties needed to utilise their expertise more efficiently to provide better vocational guidance to blue-collar retrenchees.

Source: Bertone and Lambrick (1994).

NILS offered some criticisms of this and other LAP evaluations. It concluded that:

> These studies do not answer the question as to whether LAPs are effective, either in terms of outcomes or in terms of costs. The PMV study was mainly concerned with participants' satisfaction with LAP assistance and how the LAP could be improved for participants. (sub. 202, p. 26)

NILS noted the absence of control group analysis in the evaluations. This meant that the researchers were unable to determine whether the outcomes for those participating in the LAP schemes were significantly different from the outcomes for similar job seekers who did not have access to the LAP.

NILS also cited the failure to account for displacement effects or to adequately measure deadweight losses as a major short-coming of these evaluations. If these effects are not considered then the net outcome of the program cannot be evaluated, nor a comprehensive cost-benefit analysis undertaken.

Similar criticisms apply to DEETYA's 1996 evaluation of the effectiveness of the labour market programs under *Working Nation*. However, its findings have some implications with regard to the effectiveness of wage subsidies and the implementation of case management services (see Box Q.3).

Box Q.3: **Main findings of the *Working Nation* Evaluation Report**

Shares of program assistance

Those unemployed for three years or more increased their share of assistance, while job seekers with unemployment durations of 12 to 18 months lost a large share of assistance. Job seekers with unemployment durations of less than 12 months increased their share of assistance, probably reflecting the early identification of ‘at risk’ job seekers.

Early intervention

The number of job seekers screened into further assessment was higher than expected, delaying entry into case management for some clients. In general, the report found that most ‘at high risk’ job seekers were being correctly screened, although it stated that refinements to the process were needed.

Case management

Case management had only been operational for just over a year when the study was conducted, making it difficult to tell whether it had improved employment outcomes for participants. However, DEETYA found that there were a number of factors likely to have limited the effectiveness of case management, including: pressure on case managers to achieve short term outcomes rather than sustainable unsubsidised employment; uncertainty of CES staff and case managers about the objectives; a lack of skills among case managers; a shortfall in available resources; a reluctance on the part of case managers to recommend the suspension of income support for job seekers if they failed to fulfil their obligations; the failure of the client classification system to indicate the amount of assistance job seekers required; and the need to offer assistance to job seekers who were not in a position to benefit due to other barriers.

Wage subsidies and brokered programs

The study found that restructured JobStart wage subsidies aimed at encouraging employers to take clients who had been unemployed for 18 months or more were largely unsuccessful, with the number of JobStart placements falling after JobStart was targeted at disadvantaged clients. The research showed that employers valued job seeker quality more highly than other considerations.

In addition, the availability of brokered programs introduced some degree of competition between these and wage subsidies. This made it more difficult to place clients in JobStart placements, which are more expensive for employers. Overall, there was a decrease in placements on wage subsidy programs and a significant increase in placements on brokered programs. This experience showed that employers will take on more disadvantaged job seekers if they are more fully compensated and are not obliged to provide ongoing employment. However, brokered programs cost the government significantly more than wage subsidies and employment outcomes for participants are significantly lower.

Source: DEETYA (1996a).

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