

REVIEW OF AUSTRALIA'S AUTOMOTIVE INDUSTRY 2008

BACKGROUND PAPER

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Glossary

ACIS	Automotive Competitiveness and Investment Scheme
ACPs	Automotive Component Producers (ACIS registration category)
ADRs	Australian Design Rules
AMTPs	Automotive Machine Tooling Producers (ACIS registration category)
ASPs	Automotive Service Providers (ACIS registration category)
BERD	Business expenditure on research and development
CUVs	Crossover Utility Vehicles, SUVs with some characteristics of passenger cars
FBT	Fringe Benefits Tax
FTA	Free Trade Agreement
Large Vehicles	Passenger car, hatch, sedan or wagon, 6 to 12 cylinders
LCT	Luxury Car Tax
Light Vehicles	Passenger car, hatch, sedan or wagon, 3 or 4 cylinders, up to 1500cc
LPG	Liquified Petroleum Gas
Medium Vehicles	Passenger car, hatch, sedan or wagon, 4 to 12 cylinders, 1501cc upward
MVPs	Motor Vehicle Producers (also an ACIS registration category)
People Movers	Passenger usage with seating capacity greater than 7 people
PMV	Passenger Motor Vehicle
R&D	Research and Development
Small Vehicles	Passenger car, hatch, sedan or wagon, 4 to 6 cylinders, 1501cc upward
Spillovers	Economic benefits from a sector which have positive effects on other sectors or industries
Sports Vehicles	Coupe or convertible, 3 to 12 cylinders
SUV	Sports Utility Vehicle, two or four wheel drive, high ground clearance, closed cargo space
TBTs	Technical Barriers to Trade
Upper Large Vehicles	Passenger car, hatch, sedan or wagon, 6 to 12 cylinders

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The Australian Automotive Industry

Background

The Australian automotive industry has undergone an extensive reform program, especially since the Button Plan in 1985 when the industry was protected by tariff quotas and a tariff of 57.5 percent. The removal of quotas and the lowering of protection led to some rationalisation of the industry and made imports more accessible to consumers. It has also seen the industry become more internationally competitive and export focused. For example, exports of automotive products have gone from virtually nothing to around \$4.7 billion in 2007, making automotive one of Australia's top ten export earners (and the largest manufacturing export earner). It also places the automotive sector ahead of more traditional exports such as wine, wheat and wool. This is despite the large reductions in automotive tariffs.

Domestic market

The Australian vehicle market is extremely competitive with over 30 producers represented. In 2007, the market recorded sales of over one million vehicles for the first time. This is a 45 percent increase in vehicle sales since 1997 and a 27 percent increase since 2002¹ and coincided with the increasing affordability of vehicles. Since the mid 1990s, real earnings have increased at a significantly higher rate than vehicle prices².

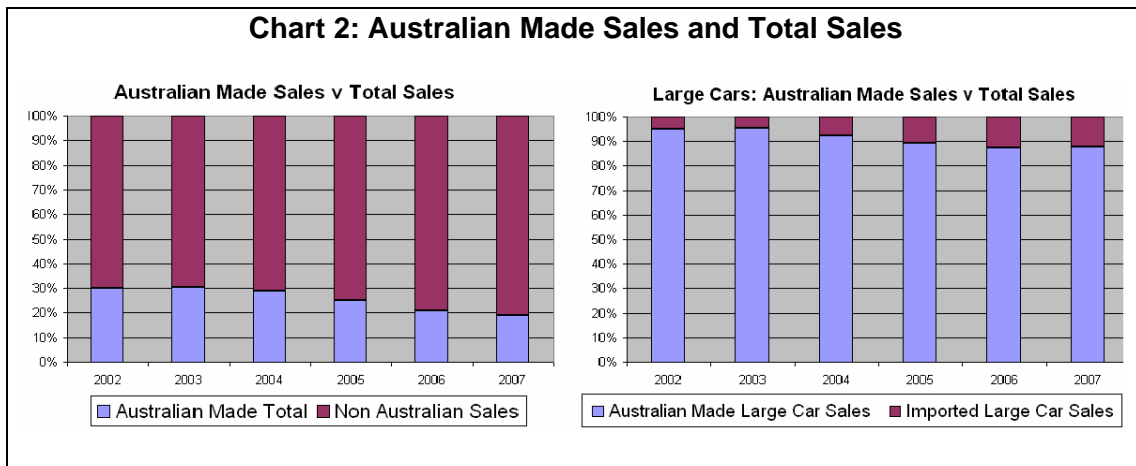
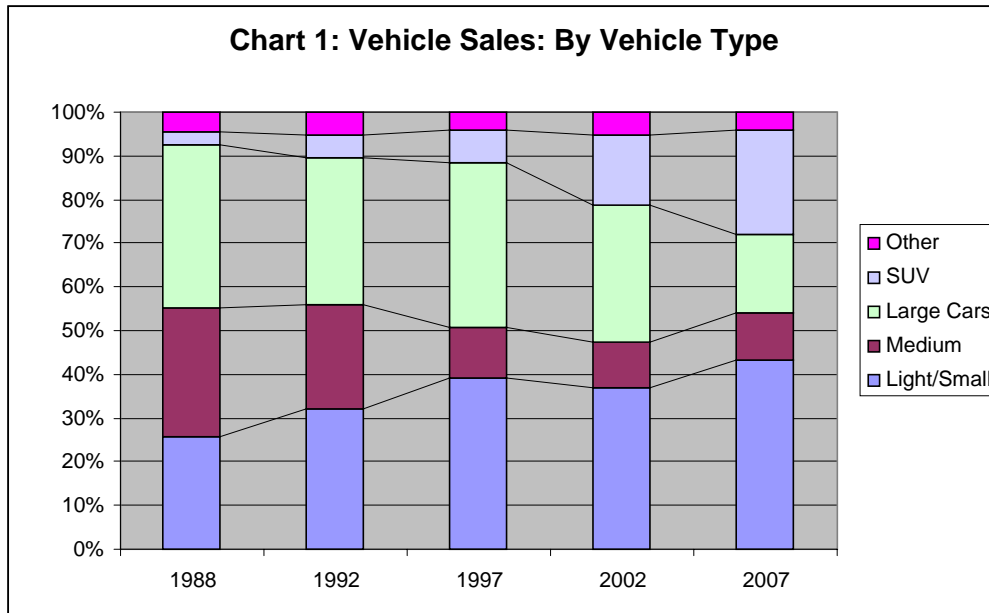
There has been a significant change in the type of vehicles demanded by consumers³. Traditionally, the Australian vehicle market has been dominated by large passenger cars and variants (eg, Holden Commodore and Ford Falcon) and large medium vehicles (such as the Toyota Aurion and Camry). There has been a recent trend towards smaller, lower fuel consumption vehicles (such as the Toyota Yaris and Corolla), SUVs (which range from the Suzuki Vitara and Toyota RAV4 through to the Hummer) and luxury cars (such as Mercedes Benz, BMWs). This has impacted on local vehicle producers, with the market share of Australian MVPs falling from 30 percent in 2002 to 19 percent in 2007. These trends are shown in Charts 1 and 2.

The Australian automotive industry mostly produces in the large/medium car segment and continues to dominate sales in this category. In this segment Australia has some scale advantages compared to other countries since worldwide production levels are not as large as in the small car segment. However, the domestic manufacturers' share of this segment has fallen – from 95 percent in 2002 to 88 percent in 2007.

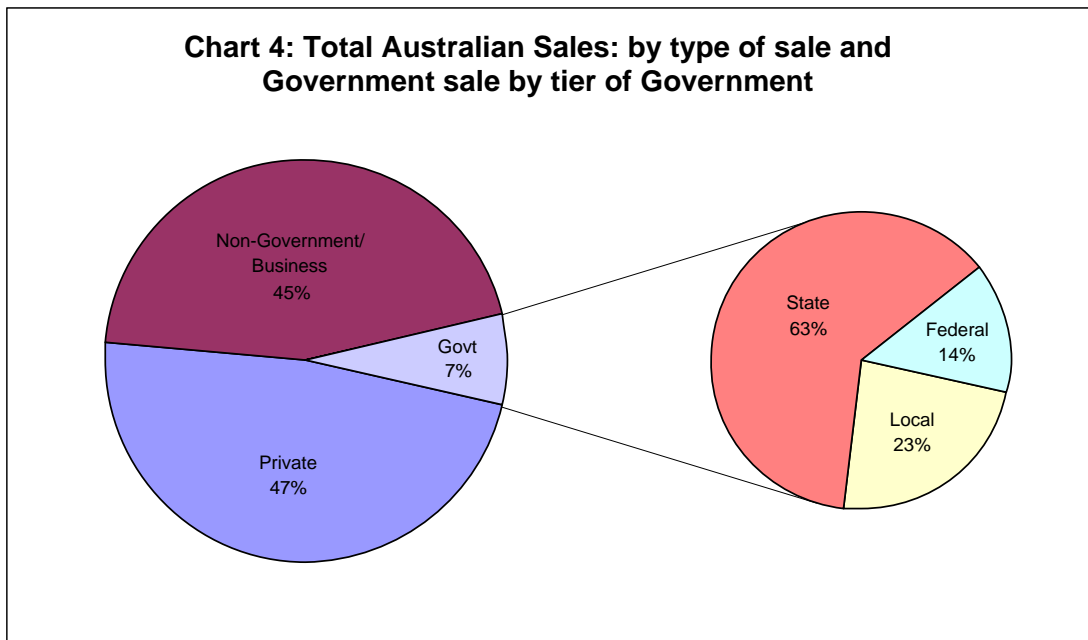
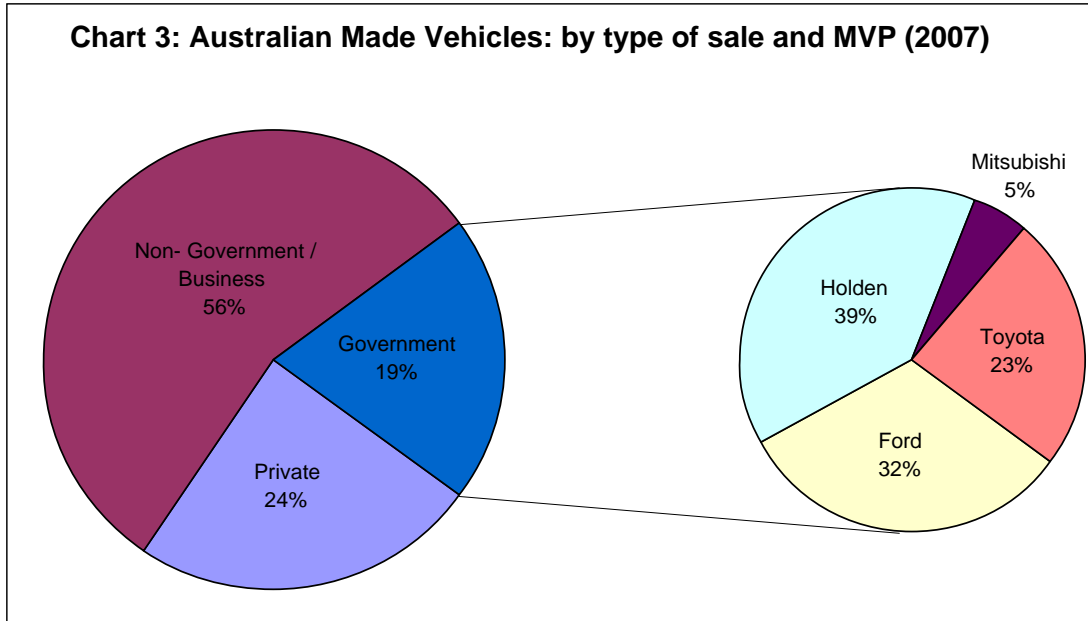
¹ VFacts

² Australian Automotive Intelligence (AAI) 2007 Yearbook, at page 51

³ VFacts



Sales of Australian-made vehicles are largely dependant on private and government fleet sales. Less than 25 percent of Australian-made vehicle sales in 2007 were to private buyers. In the same year, governments across various levels purchased 37,073 or 18.5 percent Australian made vehicles. There is also a growing level of sales to the business sector, with sales amounting to 113,807 in 2007, or nearly 57 percent of total Australian made vehicle sales.



Domestic Production

The Australian automotive industry includes a wide range of activities including vehicle production, component production, tooling and design and engineering. It is an important part of the Australian economy, employing over 61,000 people⁴ and accounting for over 5 percent of manufacturing employment. Value added for the sector totals more than \$5.6 billion⁵, representing 5.6 percent of the manufacturing sector's industry value added and 0.6 percent of national gross domestic product.

⁴ Australian Bureau of Statistics; *Manufacturing Industry, Australia, 2005-06* (Catalogue Number 8221.0)

⁵ *ibid*

There are three MVPs in Australia - GM Holden, Ford Motor Company of Australia and Toyota Motor Corporation Australia. All three companies are fully owned subsidiaries of major overseas producers. Mitsubishi Motors Australia ceased its Australian production in March 2008, though it remains in the market as an importer of a full range of vehicles.

Motor vehicle production takes place in Victoria and South Australia. Ford has an assembly plant in Broadmeadows (Melbourne) and a component and engine plant in Geelong. Holden manufactures vehicles in Elizabeth (Adelaide), and produces V6 engines at its Fishermans Bend (Melbourne) facility. Toyota manufactures vehicles and 4 cylinder engines in Altona, Melbourne. All three MVPs have research and development capability within Australia.

In addition, there are over 200 firms producing automotive components, predominantly based in Melbourne and Adelaide. The Australian automotive industry also has access to specialised tooling services from around 500 firms.

In 2007, production of Australian vehicles numbered 327,984 which is a drop of 5 percent from 2000⁶. In global terms, this level of production is relatively small, accounting for less than half of one percent of world production. Competing against countries with major production scale advantages presents a difficult challenge for the Australian automotive industry.

*Profitability*⁷

A major concern for the Australian automotive industry has been the falling profitability levels of the local MVPs. In 2006, trading losses in vehicle manufacturing for the MVPs were \$705 million, or a 8 percent loss on sales. This was somewhat offset by MVPs' sales of components, with net losses on all MVP activities totalling \$502 million. These significant losses can be compared to a decade earlier, when total net trading profits for the MVPs were \$518 million, including \$344 million profits on vehicle manufacturing. Justifying domestic production with such large trading losses presents a major challenge to the Australian MVPs.

There is also evidence component producers are having their profit margins reduced as the competitiveness of imports increases due, in part, to the strong Australian dollar, and standard global platforms which allow MVPs to increase import substitution of components.

The Australian MVPs are heavily reliant on Australian inputs. In 2006, motor vehicle producers sourced 75 percent of its components from Australian component producers, worth \$4.6 billion⁸. Similarly, Australian component producers are heavily reliant on domestic sales - 81 percent of total sales (or \$5.15 billion) are made domestically⁹.

⁶ www.fcail.com.au/volumes

⁷ Key Automotive Statistics 2006, (DIISR)

⁸ *ibid*

⁹ *ibid*

Some trends have developed in the past few years which have challenged the linkage between domestic MVPs and component producers. Firstly, MVPs are more commonly sourcing components from overseas due to the rise of global platforms. Since 1994, Australian component imports have increased by 74 percent¹⁰. Secondly, MVPs are generally only awarding short-term components contracts, which is undermining the financial security of many component producers¹¹. As a result, many component producers are moving their operations overseas or reducing their reliance on domestic sales. For example, in 1994, 90 percent of component producers' sales were derived from the domestic market. This had fallen to 82 percent of sales in 2000, and has remained relatively static up to 2006.

The Australian tooling industry is also heavily reliant on capital investment by the MVPs and components sector in plant and equipment, such as assembly and sub-assembly lines. This investment is 'lumpy' in nature and centred around new model launches. The tooling industry is also facing increased competition from imports of basic tools, particularly from China and India.

Investment

Investment flows in the industry are quite lumpy due mainly to the long lead-in times for the design, development and release of new models. The investment rate (value added) for motor vehicle and part manufacturing increased by an average rate of 22.8 percent in the five years to 2005-06. Taking motor vehicle manufacturing in isolation, the sector's investment rate increased on average by 34.6 percent during this period.

Trade

Imports

The Australian automotive industry operates in an increasingly competitive global environment. It faces competition from traditional automotive producers such as Japan, the EU and the USA, and from Asian economies such as Thailand, China and South Korea. Imports have increased significantly over the past few years from \$18 billion in 2002 to \$27 billion in 2007, an increase of 47 percent. This increase came largely from a 61 percent increase in vehicle imports since 2002.

Australia's major source of imports remains Japan (36 percent of vehicle and parts imports), followed by Thailand (12 percent), the United States (12 percent), Germany (9 percent) and South Korea (6 percent). The largest import growth has been from Thailand, which increased by \$2.1 billion between 2002 and 2007. Some of this can be attributed to the Thailand-Australia FTA, which allows duty free entry of Thai-manufactured vehicles into Australia.

¹⁰ Key Automotive Statistics 2006, (DIISR)

¹¹ House of Representatives (HoR) Standing Committee on Employment, Workplace Relations and Workforce Participation, *Shifting Gears – Employment in the automotive components manufacturing industry*, <http://www.aph.gov.au/house/committee/ewrwp/automufacturing/report.htm>, 2006 at p13

Exports

In 2007, total automotive exports from Australia amounted to \$4.7 billion, which places it in the top ten export earners and ahead of more traditional exports such as wheat and wool. Of this, \$2.9 billion was for the export of motor vehicles, and \$1.7 billion was for the direct export of automotive components.¹² That is, components not incorporated into vehicle exports.

The Australian motor vehicle producers have become increasingly focused on export markets. The Australian motor vehicle market is relatively small, and MVPs are facing difficulty in achieving scale economies solely on the strength of domestic sales. In 1997, only 16 percent of total production of Australian motor vehicles was sold overseas. By 2006, this figure has increased to 40 percent of local production.

Since 2002, automotive exports have fallen by 4.6 percent to \$4.7 billion dollars. Over this period, exports of vehicles fell by 8.5 percent, which was partly offset by a 2.6 percent increase in component exports. The fall in the value of vehicle exports can be partly explained by the appreciation of the Australian Dollar which has decreased the Australian dollar value of exports where contracts are denominated in US dollars.

Exports of vehicles are very important to the component sector given the high local content in Australian-made cars, and the dependence of component producers on sales to domestic MVPs.

In the past few years, the Middle-East has emerged as Australia's main export market. Exports to Saudi Arabia, the United Arab Emirates, Kuwait, Oman, Qatar and Bahrain amounted to \$2.2 billion in 2007 or 46 percent of total automotive exports (and 75 percent of vehicle exports), an increase of 19 percent since 2002. Australia's largest single trading partner is Saudi Arabia with automotive sales of \$1.2 billion in 2007. This dependence on the Middle-East market is a concern for the industry, especially with growing competition from Asian nations that enjoy scale and geographic advantages over Australia.

Other major automotive export markets include New Zealand (16 percent), the Republic of Korea (9 percent) and the United States (9 percent). Automotive exports to the United States have decreased by 64.6 percent from 2002 to 2007, falling from \$1.1 billion to \$394 million over this period.

¹² STARS Database

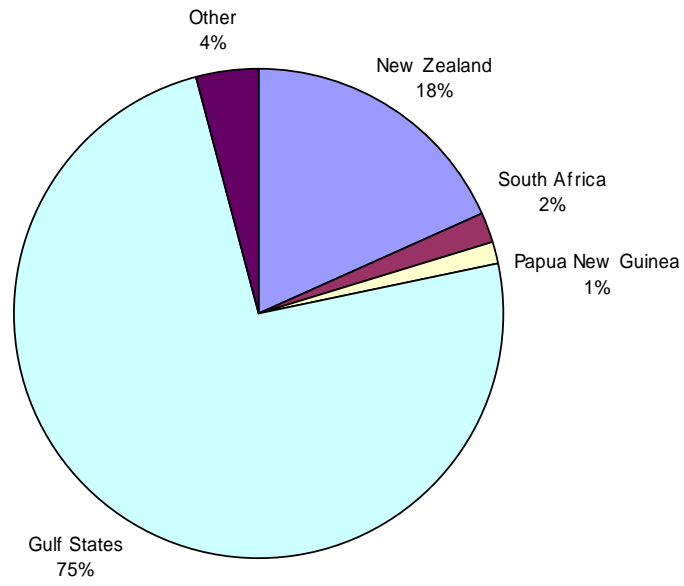
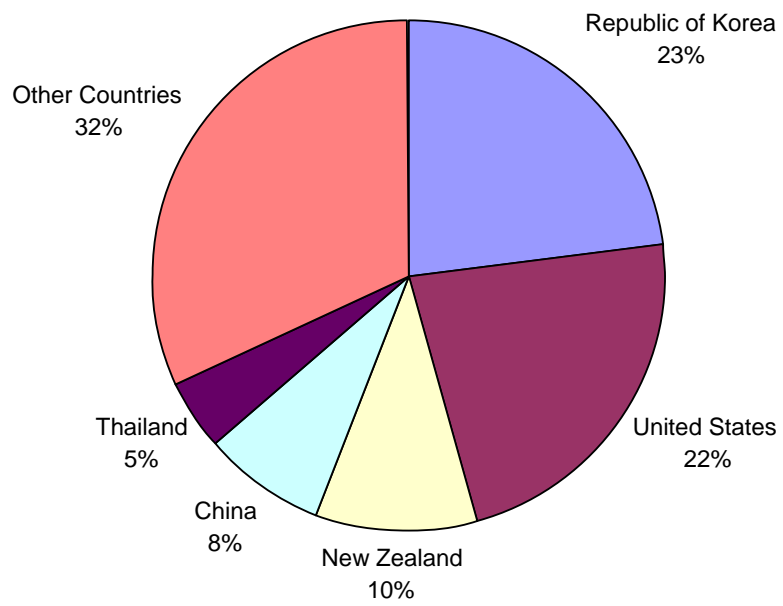
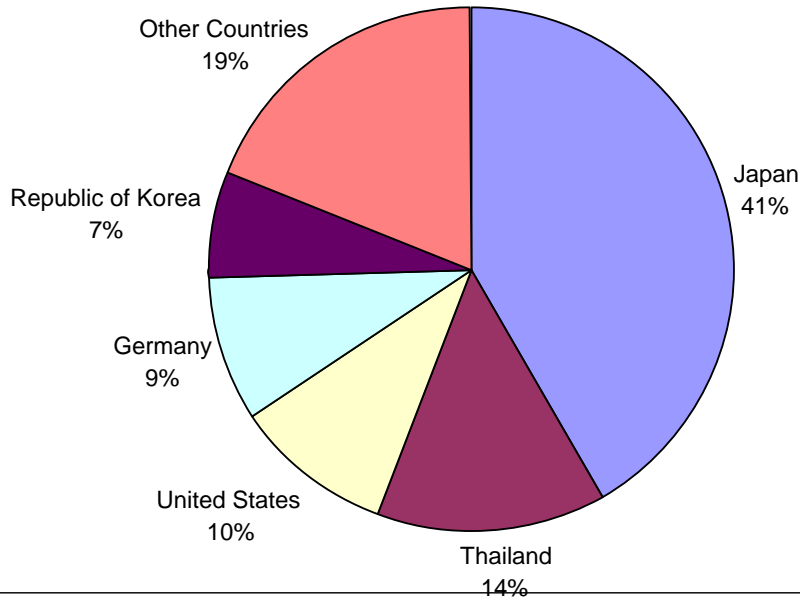
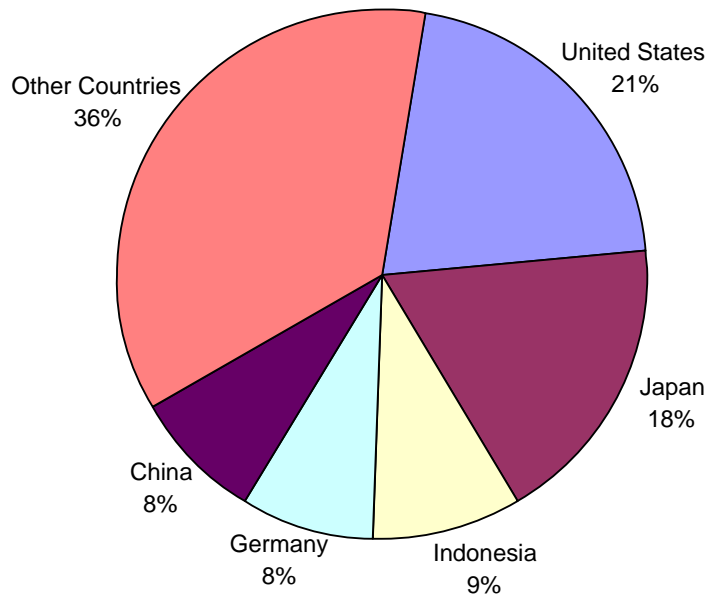
Chart 5: Vehicle Exports: Major Trading Partners 2007**Chart 6: Component Exports: Major Trading Partners 2007**

Chart 7: Vehicle Imports: Major Trading Partners 2007**Chart 8: Component Imports: Major Trading Partners 2007**

The Rising Australian Dollar

The strength of the Australian dollar, especially in relation to the US dollar and Japanese Yen, has had a negative effect on the competitiveness of the Australian automotive industry. Since January 2002 (to January 2008), the value of the Australian dollar appreciated 77 percent against the US dollar, 40 percent against the Japanese Yen, 27 percent against the South Korean Won and 36 percent on a trade-weighted basis.

This has led to Australian vehicles becoming relatively more expensive compared to their import competition. The new car price index, which measures the average retail prices of vehicles, has increased by 9 percent since 2001 for Australian automobiles¹³. However, over the same period, the price index of all imported vehicles dropped by 2 percent, and for Japanese vehicles fell by 4 percent. It also impacts on exporters, with many contracts denominated in \$US.

On the other hand, MVPs and some component producers have a natural hedge against the rising Australian dollar, as they import inputs to production. In addition, the appreciation of the Australian dollar has reduced the cost of imported capital equipment required for upgrading and expanding capacity.

¹³ Australian Automotive Intelligence (AAI) 2007 Yearbook

The Global Automotive Industry

Introduction

The production of motor vehicles comprises the largest manufacturing sector in the world, with output of the industry equivalent to the world's sixth largest economy.¹⁴ While it is a key activity in advanced industrial nations, the industry is also of increasing significance in the emerging economies of North and East Asia, South America and Eastern Europe. It draws on a wide range of supplier industries, from raw materials (such as steel, aluminium, plastics and chemicals) through to sophisticated component assemblies, tooling, design and engineering services. The industry is also one of the largest investors in research and development (R&D), playing a key role in society-wide technological development. With its skill base and innovative practices, the automotive sector is often seen as providing an effective national training ground for many manufacturing and engineering employees in very diverse industries.

Geographical Diversification and Globalization of Production

Global Production and Sales

Global production of passenger motor vehicles (PMVs) grew by around 25.5 percent between 1999 and 2006, from just under 40 million units to almost 50 million units. Global production of commercial vehicles increased from around 16.4 million units to 19.2 units over the same period, an overall increase of around 16.6 percent.

Nonetheless, sales growth has significantly lagged below the growth of production volumes (with 67.5 million sales versus nearly 70 million units produced). Indeed significant excess capacity continues to exist in the industry. As a result, a large number of motor vehicle producers, particularly in the mature economies, have undertaken costly restructurings and rationalisations in order to reduce capacity and realign both their production volumes and employee numbers with often stagnant or even negative domestic sales growth.

Rise of Emerging Markets and Geographical Dispersion of Production

Demand for vehicles has grown rapidly in developing countries, providing an incentive for the major global vehicle and component manufacturers to set up production facilities in these markets. While developed countries such as the United States and Japan still account for the bulk of global vehicle, component and related development and design activities, the geographical diversification of production has resulted in a shift in the balance of output towards developing countries.

It is estimated that emerging markets will contribute about two thirds of the growth in global light vehicle assembly between 2006 and 2014. In particular, the group of rapidly emerging economies known as BRIC (Brazil, Russia, India and China) look set to increase their share of global light vehicle assembly from 16 percent in 2006 to

¹⁴ *Organisation Internationale des Constructeurs d'Automobiles (OICA)*, aka International Organization of Motor Vehicle Manufacturers, <http://oica.net/category/economic-contributions/>.

23 percent in 2014, while production in the European Union, North America and Japan will either decline (albeit slightly) or experience only marginal growth. China is now the world's second largest automotive market and produced around 9 million vehicles in 2007, up almost 23 percent from 2006.

The competitive impact brought about by the rise of developing economies, particularly China, points to the intensification of cost cutting pressures and increasing competition for new investment in the industry. Increasingly, mature economies are battling to compete against their lower-cost rivals, several of whom are now developing significant design, engineering and R&D capabilities.

Profits

The combination of intensified competition, ensuing cost pressures and excess capacity has placed increasing strain on MVPs' profit levels. PricewaterhouseCoopers (PWC) reported that only Porsche AG had achieved a gross profit margin of over 50 percent for FY2006. In fact, no other automaker reached 30 percent, with only Honda and Mazda getting close to that level. The gross profit margin for the majority of the other automobile manufacturers hovered around 20 percent. DaimlerChrysler, Fiat, Ford, General Motors and Volkswagen all achieved gross profit margins of between 15 and 19 percent.¹⁵

However, some companies such as Ford, GM and Mitsubishi Motors Corporation have suffered large net losses in recent years due to costs of reorganisation and other factors. This has also impacted on the profitability of their suppliers.

Employment

The automotive industry is a significant employer of labour in both developed and emerging economies. According to Organisation Internationale des Constructeurs d'Automobiles (OICA), about 9 million people are directly employed in the industry. This is over 5 percent of global manufacturing employment.

The most recent available data shows that China now has the largest automotive industry workforce with around 1,605,000 employees, followed by USA (954,210), Germany (773,217), Russia (755,000) and Japan (725,000). In 2006, the automotive labour force in these five countries comprised around 53.5 percent of global employment in the industry. However, several emerging economies have substantial and in most cases, rapidly growing automotive employment levels; along with China and Russia, these include Brazil (289,082 employees), India (270,000), South Korea (246,900), Turkey (230,736), Thailand (182,300), Mexico (137,000) and South Africa (112,300).¹⁶

Over the last few years, automotive employment growth in the advanced economies has been relatively stagnant and, in some cases, employment has actually declined. In North America, around 100,000 employees are set to leave the industry over the next

¹⁵ PWC, Global Automotive Financial Review (2007 edition).

¹⁶ These employment numbers are sourced from OICA (2007).

couple of years, while employment levels in Western Europe and Australia have also come under pressure from a spate of plant closures and abolished shifts.

The Automotive Components Sector

While global demand for automotive products has been growing for the last several years, large segments of the supply industry have been struggling. Many suppliers have closed up shop, while many others are fighting for survival. Among the problems currently faced by suppliers are soaring raw material prices and constant demands from MVPs to reduce prices and self-finance R&D. As vehicle manufacturers strive to reduce costs and achieve greater scale efficiency they have tended to source from fewer larger component suppliers, and they have either switched supply to lower cost sources or pressured component producers to achieve cost down targets.

The components sector is becoming increasingly global. The number of manufacturing plants operated by supplier companies has increased considerably over the last 10-15 years. In addition, many previously medium-sized supplier companies have expanded into global companies. A large number of companies that had only three or four production plants in a small number of countries at the beginning of the 1990s now have a production network of well over 20 locations around the world. Some companies have even become 'mega-suppliers', operating location networks of 100 to 200 production sites.¹⁷

Government Support

Significant direct employment in the industry, its strong linkages to other parts of the economy and perceived technological and employment spillovers, have led many governments to provide various forms of assistance for their automotive industries. This has involved the imposition of tariffs or other import barriers, funding investment incentives and export subsidies, protection for intellectual property (IP) rights, and support for R&D and for education and training.

Over recent years, government support in the leading industrial nations (including Australia) has shifted away from import barriers and towards support for R&D, education, training and IP; but protection from imports (often of the non-tariff variety) still plays an important role in most emerging economies. Fiscal support packages, along with incentives to attract foreign investment, such as tax holidays and reduction of income tax rates for foreign companies, are also widespread, although such policies are common in both developed and developing countries.

¹⁷ KPMG (2005), "Global Location Management in the Automotive Supplier Industry"

Changes in Market Demand and Technology

The profile of vehicle demand varies considerably across national markets. For example, in the US market, the rise of sports utility vehicles (SUVs) in the 1990s has given way to the increasing market ascendancy of crossover utility vehicles (CUVs), which are forecast to grow by 2.1 million units from 2006 to 2014¹⁸; in Japan, minicars have been market leaders; while in Europe, South America and most Asian markets, small and medium size models account for the bulk of sales.

Recent trends in market demand, particularly in the more industrially advanced countries, have been driven by changing community and consumer expectations in regard to vehicle quality, safety, and environmental credentials. In particular, increasing concern over CO₂ emissions and fuel economy have shaped consumer tastes and led to increasing demand for alternative fuel or hybrid vehicles, and a drop-off in demand for what are perceived as "petrol-guzzling" larger cars. As a result, technological developments are proceeding rapidly so as to keep pace with both changing consumer expectations and tighter regulations by governments striving for more environmentally-friendly and fuel-efficient cars.

Environmental and safety concerns have been important drivers of product innovation in the automotive industry. This is discussed more fully in the Innovation section.

The Productivity Commission noted in 2002 that "the greater complexity of modern vehicles — partly reflecting more stringent safety and environmental requirements — has raised the cost of product development". In fact, the cost of developing a new vehicle (already as high as \$US 1 billion for some vehicles in 2002) continues to rise — due, in no small part, to consumer demand for a wider range of vehicle types which conform to specified environmental and safety standards and to the proliferation of vehicle models.

Challenges faced by the Leading Industrial Nations

The state of vehicle manufacturing in developed industrial regions of North America, Western Europe and Japan is somewhat of a mixed bag. Severe competitive pressures and costly restructurings (particularly in North America and Western Europe) are partly offset by some positive signs of renewed growth, due in no small part to ongoing product and process innovations.

In North America, the "Big 3" automakers (GM, Ford and Chrysler) are facing severe competitive challenges. All three companies are undergoing restructurings, as they struggle to bring their capacity and workforce into line with their diminished market shares and grapple with 'legacy' costs, especially health care. Recent and prospective plant closures are expected to result in the shedding of 1.9 million units of capacity, along with around 100,000 employees. Apart from eliminating fixed costs, their recovery efforts will largely hinge on recapturing, or at least stabilising, market shares through a renewed product range. On the other hand, extra capacity of almost one million units of assembly is expected in the next few years as a result of localised assembly of previously imported vehicles by the so-called "New Domestics" (mainly

¹⁸ PriceWaterhouseCoopers, Global Automotive Financial Review (2007 edition).

Japanese-owned MVPs that are building new capacity in recently established or brand new Greenfield sites outside the heavily unionised industrial heartlands of Detroit *et al*).¹⁹

In Japan, domestic sales have been stagnant since the mid-1990s; but the growth of export volumes has been picking up the slack. In fact, for the last several years, the majority of growth that has taken place in the Japanese auto assembly sector can be attributed to the export volume that resulted as automakers shifted strategy to leverage Japan as a hub of higher value added products, such as petrol-electric hybrids and luxury vehicles. Nonetheless, light vehicle assembly is expected to fall considerably between 2006 and 2014, largely due to strategic decisions to produce more vehicles in offshore locations such as Thailand and even the US where companies are seeking to consolidate and further expand.

Europe has experienced several high profile plant closures in recent years. Moreover, capacity has been reduced at a number of other plants by eradicating shifts. The result has been a 1.5 million unit reduction of capacity in Western Europe between 2000 and 2007. Some capacity has been relocated to lower-cost greenfield sites in Eastern Europe, particularly the Czech Republic, Slovakia, Poland, Turkey and Romania. On the other hand, vehicle assembly is rebounding in some established car producing nations, particularly Germany, which, according to PWC's forecast, "will likely see an increase of more than 900,000 units by 2014".²⁰ For Germany, as with Japan, growth is predicated on export volumes and specialisation in high value added production, particularly engineering and design excellence. In addition, there have been changes to the workplace relations and wages systems in a major automotive company in Germany which is aimed at reducing labour costs and improving productivity. The trade-off for this was the maintenance of production in Germany.

¹⁹ PWC, Global Automotive Financial Review (2007 edition).

²⁰ *ibid*

Current Automotive Policy Arrangements

Introduction

The two current major mechanisms of support for the Australian automotive industry are the automotive tariff arrangements and the Automotive Competitiveness and Investment Scheme (ACIS). The industry is also supported through Government purchasing preferences and the specific tariff arrangements for second hand vehicles.

New vehicle sales are subject to the Goods and Services Tax (GST) and the Luxury Car Tax (LCT). Fringe Benefits Tax (FBT) may be payable on a vehicle provided by a business to an employee for personal use. The industry is also subject to several other Commonwealth and State taxes including company tax and payroll tax.

Tariffs

Applied tariffs on passenger motor vehicles and related components are currently 10 percent and are scheduled to be reduced to 5 percent on 1 January 2010. Tariffs on commercial vehicles and four wheel drive vehicles and parts thereof are 5 percent.

There was around \$1.2 billion of import duties paid on imported PMVs and light commercial vehicles in 2006-07^{21 22}. When combined with the affect of ACIS (which provides import duty credits to the local industry), the average import weighted tariff (or nominal effective tariff) on vehicles²³ (tariff revenue/value of imports) in 2006-07 was less than six percent.

In addition, on 15 November 1994 at Bogor in Indonesia, political leaders from the Asia-Pacific Economic Cooperation countries reached an agreement - the *Bogor Declaration* - to complete the achievement of the goal of free and open trade and investment in the Asia Pacific region. The industrialised economies are to achieve the goal no later than 2010 and developing economies no later than 2020.

Recent Regional Trade Agreements

Australia - United States Free Trade Agreement

Under this Free Trade Agreement (FTA), Australia and the US eliminated customs duties on almost all automotive products. The exception is for Australia's import tariffs on passenger motor vehicles sourced from the US. These are being phased to zero by 2010.

Over the period 2005 to 2007, exports of components to the US decreased by 15 percent to \$371 million while imports of parts remained unchanged at around \$1.2 billion. The decrease in exports could be partly attributed to the loss in market share by the Big 3 automakers as well as component companies co-locating next to production facilities of vehicle and Tier One manufacturers. Vehicle export to the US

²¹ DIISR; *Trade Information System* (incorporating unpublished import and export data from the ABS).

²² Defined as vehicles listed under Chapter 87 of the Customs Tariff Schedule 3.

²³ Vehicles listed as passenger motor vehicles and light commercial vehicles (8703 and 8704) of the Customs Tariff Schedule 3.

fell significantly over the same period. However, this was due to the cessation of export programs which are expected to be reversed with announcement that GM Holden will begin exporting the Pontiac G8 car as well as utes.

Australia – Thailand Free Trade Agreement

Under this agreement, Thailand eliminated its 80 percent tariff on Australian passenger cars with an engine capacity of above 3 litres and will phase its tariff on Australian cars with an engine capacity of 3 litres and below to zero by 2010.

Australia eliminated its tariff on Thai passenger cars upon entry into force of the FTA. For goods vehicles, the Thai tariff and Australian tariff were both eliminated. Both Australia and Thailand will phase to zero by 2010 their tariffs on automotive components and parts.

Over the period 2005 to 2007, exports of components to Thailand increased by 87 percent to \$75 million while imports of components from Thailand increased by 205 percent to \$497 million. Exports of vehicles to Thailand are constrained by Thailand's vehicle excise taxes which are based on engine capacity. However, in the two years to 2007, imports of vehicles from Thailand increased by 97 percent to \$2.7 billion.

Australia and New Zealand Closer Economic Relations Agreement

Australia and New Zealand are parties to the bilateral Closer Economic Relations (CER) Trade Agreement. CER is a WTO consistent free trade area allowing for free trade in goods and services between Australia and New Zealand.

PATCRA and SPARTECA

Australia is also a party to separate trade agreements with Papua New Guinea (PATCRA) and the South Pacific Island Countries (SPARTECA) allowing goods produced in those countries duty free access to the Australian market. At present, none of these countries manufacture motor vehicles but there is some production of automotive components.

Second-hand Car Tariff

All used vehicles built on or after 1 January 1989 need to qualify under the Specialist and Enthusiast Vehicle Scheme (SEVS) or Registered Automotive Workshop Scheme (RAWS) and be certified as complying with Australian Design Rules applicable at the date of the imported vehicles' manufacture. All used vehicles manufactured before 1989 may be imported without restriction.

Used vehicles attract a tariff of 10 percent for passenger vehicles and 5 percent for light commercial vehicles and 4WDs, in addition to a non-ad valorem tariff of \$12,000. Vehicles imported under SEVS/RAWS do not attract the non-ad valorem tariff.

In 2006-07, 27,854 second hand passenger motor vehicles were imported into Australia, an increase of 61 percent over the previous year²⁴.

Automotive Competitiveness and Investment Scheme

ACIS is a transitional assistance scheme directed towards encouraging new investment and innovation in the Australian automotive industry in the context of trade liberalisation. ACIS rewards strategic investment, research and development (R&D), and the production of eligible motor vehicles through the issue of import duty credits to registered participants. These credits can be used to discharge customs duty on eligible automotive imports, or alternatively, can be sold or otherwise transferred.

ACIS commenced in 2001 (following on from the closure of the Export Facilitation Scheme in 2000) and under the current policy settings will cease on 31 December 2015. Under current arrangements, ACIS is expected to deliver an estimated \$7.2 billion to the Australian automotive industry over the period 2001 to 2015.

The *ACIS Act* requires that:

- capped assistance is limited to the stage caps (\$2 billion from 2001-2005; \$2 billion from 2006-2010; and \$1 billion from 2011-2015); and
- assistance to individual recipients is limited to 5 per cent of their previous year's sales.

Funding for each stage is split between motor vehicle producers (55 percent) and the supply chain (45 percent). Quarterly assistance to individual recipients is determined on a pro-rata basis (using a MVP modulation rate or a component producer modulation rate).

Uncapped production credits are only available to MVPs and credits issued are based on the value of production of PMVs sold in Australia and New Zealand. Issued credits are not subject to modulation but, similar to capped credits, are subject to the 5 percent of sales limit.

ACIS also includes the MVP R&D Scheme which is directed at encouraging Australian MVPs to invest in high-end R&D technologies. The scheme offers up to \$150 million of assistance for R&D projects over the five-years from 2006 to 2010. The Government's \$7.2 million Supplier Development program, funded under the MVP R&D Scheme, aims to enhance the capabilities of Australian automotive component suppliers and assist them to more effectively identify and secure emerging opportunities in international supply chains.

ACIS credits earned can be used to discharge customs duty on eligible automotive imports, or alternatively, can be sold or otherwise transferred. Total ACIS payments paid up to the third quarter 2007 are shown in the charts below.

²⁴ DIISR; *Trade Information System* (incorporating unpublished import and export data from the ABS).

Chart 9: ACIS Payments by Eligible Activity (Total ACIS Stage 1 & 2 paid up to Q3 2007), Including \$ values for each activity

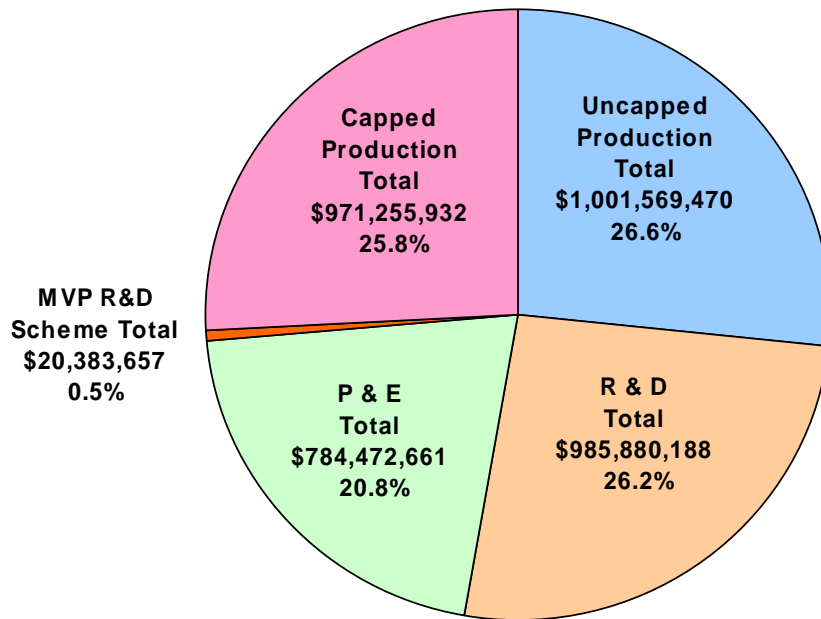


Chart 10: ACIS Payments: by Registration Category

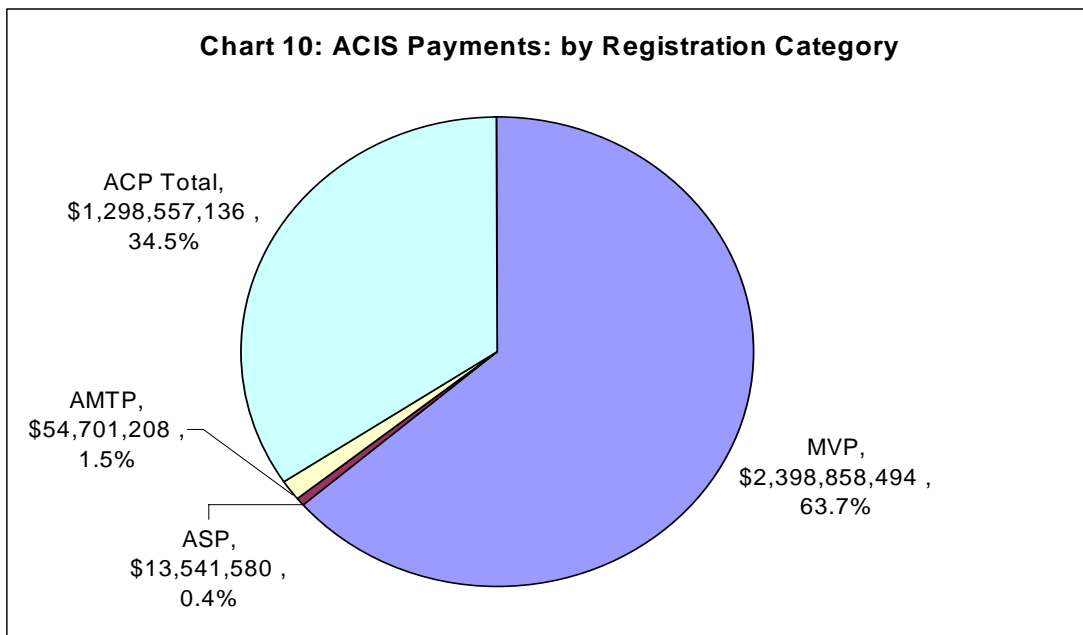


Table 1: ACIS Modulation Rates

	Investment	Production
Q1 2001	1	1
Q2 2001	1	1
Q3 2001	1	1
Q4 2001	0.75	0.75
Q1 2002	0.71	0.71
Q2 2002	0.71	0.71
Q3 2002	0.71	0.71
Q4 2002	0.62	0.62
Q1 2003	0.62	0.63
Q2 2003	0.57	0.63
Q3 2003	0.55	0.68
Q4 2003	0.52	0.68
Q1 2004	0.52	0.71
Q2 2004	0.5	0.7
Q3 2004	0.48	0.71
Q4 2004	0.48	0.79
Q1 2005	0.5	0.83
Q2 2005	0.5	0.84
Q3 2005	0.51	0.87
Q4 2005	0.33	0.62
	MVPs	Supply Chain
Q1 2006	0.7	0.71
Q2 2006	0.69	0.64
Q3 2006	0.68	0.63
Q4 2006	0.62	0.64
Q1 2007	0.63	0.65
Q2 2007	0.64	0.64
Q3 2007	0.65	0.63
Q4 2007	0.63	0.63

Other Support Arrangements

Tradex

The Tradex Scheme enables exporting companies to obtain an up-front exemption from customs duties and other taxes provided that the goods are subsequently exported, or incorporated in goods that are exported, within 12 months or another approved period. In this way, the scheme provides benefits to exporters which are equivalent to those available in a free trade zone, without the expenses involved in maintaining a bonded warehouse.

Duty Draw Back Arrangements

The Duty Drawback Scheme enables exporting companies to obtain refunds of payments of customs duties where those goods will be treated, processed or incorporated in other goods for export or when goods are re-exported unused since importation. Duty draw back can only be claimed after the goods have been exported.

Specific Company-level Assistance

There have also been a number of one-off measures implemented to assist the industry achieve specific goals, including Commonwealth assistance to Ford Australia and to GM Holden. The \$52.5 million grant to Ford Australia, with matching assistance from the Victorian Government, was to enable them to develop the next generation Falcon and design and engineer a pick-up truck platform for the global market. Similarly, there was a \$6.7 million grant to Holden, with matching funds from the Victorian and South Australian Governments, to introduce safety and fuel management improvements and further reduce greenhouse gas emissions on Commodore vehicles.

LPG Vehicle Scheme

The Australian Government established the *LPG Vehicle Scheme* to assist private use motorists with the purchase of a new LPG vehicle or the conversion of a new or used petrol or diesel vehicle to LPG. Two different grants are available: a grant of \$2,000 following the LPG conversion of a new or used petrol or diesel motor vehicle or a grant of \$1,000 for the purchase of a new motor vehicle with an LPG unit fitted at the time of manufacture of the vehicle. The scheme has provided grants worth \$219 million to February 2008.

As at 31 March 2007, there were 256,395 passenger vehicles registered which were powered by LPG, or were dual fuel or other. This represents 2.2 percent of total passenger motor vehicle fleet²⁵.

Government Purchasing Preferences

Business and government fleet purchasers account for over ¾ of total domestic demand for Australian-made vehicles in 2007 (business accounting for 56.8 percent and government 18.5 percent). Government purchases are supported by local preferences applying to some government entities at the state and national level. For example, Victoria's State Government car fleet contracts are with the domestic producers. Some other States, however, are actively encouraging the purchase of more fuel efficient vehicles.

²⁵ Australian Bureau of Statistics; *Motor Vehicle Census, 31 March 2007* (Catalogue Number 9309.0)

Green Car Innovation Fund

The Government has also announced that it will establish a Green Car Innovation Fund worth up to \$500 million over the five years from 2011 to provide incentives for R&D and innovation, to support the use of new engineering solutions and advanced materials to improve fuel efficiency in Australian made vehicles. The Fund will help the industry meet a range of challenges such as climate change and the environment and consumer demand for more fuel-efficient vehicles.

Domestic Taxation of Vehicles

Vehicles are subject to a range of taxes on both purchase and use. Under Australia's federal system of government, taxes are levied at both the national and state/territory levels.

National Level

A 10 percent GST applies to the sale of all automotive vehicles. This tax operates in a similar way to the Value-Added Taxes common in many other countries.

A Luxury Car Tax (LCT) of 25 per cent applies on retail values in excess of A\$57,123 for the 2007-08 financial year (ie, 25 per cent only on the proportion of the price above this amount). The car limit is indexed annually. Certain commercial vehicles, emergency vehicles, motor homes, campervans and vehicles adapted to carry people seated in wheelchairs are exempt from the luxury car tax. The LCT threshold is also the maximum value of a vehicle for depreciation purposes.

The LCT raised nearly \$298 million of revenue in 2004-05. Over ¾ of LCT collections in that year were raised from companies.

State/Territory Level

State and Territory taxes vary in detail and level from state to state. However there are some common elements. Stamp duties are ad valorem taxes (approximately 3 per cent) on the first registration of vehicles. There is also a flat fee for the initial issue of license plates in most States and Territories. Annual registration fees are levied on all motor vehicles with higher fees for large commercial vehicles and lower fees for motor bikes. All vehicles are required to carry insurance covering personal injury caused to third parties.

The industry is also subject to payroll tax, with different thresholds applying across the states and territories

Fuel Taxes

Excise duty is currently applied at a rate of A38.143 cents per litre to unleaded petrol and diesel. Ethanol and biodiesel also attract an excise rate of A38.143 cents per litre but they also receive an offsetting production subsidy. All fuels are also subject to GST.

Fringe Benefits Tax

Fringe benefits tax (FBT) is levied on vehicles provided by an employer for an employee's private use, including those used by an employee under a novated lease arrangement. The statutory formula used to levy FBT is on a sliding scale, which decreases as the distances travelled increases.

Standards and Technical Regulations

Whole vehicle type approval is applied to vehicles when first supplied to the market for use in transport. Both safety and environmental protection provisions are mandated under the *Motor Vehicle Standards Act 1989*.

Vehicle manufacturers must supply evidence of compliance with applicable Australian Design Rules to Vehicle Safety Standards before a type approval is issued. An examination of a sample vehicle is made to ensure that the vehicle is of the type described by the manufacturer in the application for approval. The approval allows the manufacturer to affix a mandatory Identification Plate to each vehicle prior to sale.

The Australian States and Territories have responsibility for road vehicles after they have been supplied to the market. The general rule applied is that vehicles are required to continue to comply with the Australian Design Rules applicable at the time of manufacture.

Most Australian standards are aligned with the United Nations Economic Commission for Europe 1958 vehicle standards. The emissions, noise and safety standards are discussed more fully in the relevant sections below.

Innovation

Introduction

Innovation is critical to the automotive industry in meeting future challenges and achieving efficiency and productivity gains. While there is no one definition of what constitutes innovation it is agreed that it is much broader than research and development (R&D), and can include product and process improvements, organisational change, improvements to workforce skills and management, and technology uptake (including to achieve global catchup)²⁶.

The Automotive Design and Manufacturing Process

The introduction of a new model can take around 3 to 5 years from inception through design, assembly and sale to the public²⁷. It also requires a large investment. For example, the development of Holden's new VE Commodore was a \$1.04 billion project²⁸.

The Australian automotive industry has shown that it has capabilities across the full automotive design and manufacturing process, not only in servicing the small domestic market, but in securing export markets and developing 'niche' vehicles. Some firms in the industry have also become centres of excellence in the design and engineering for certain types of vehicle platforms within their parent companies' global operations, while others undertake R&D and manufacture (or license technology for the manufacture) of specific components for international markets.

For the industry to remain globally competitive it may require continuous improvements in productivity and investment in innovation. This may also help meet the challenges posed by changing consumer tastes and regulations – such as for more fuel efficient and safer vehicles, or for vehicles which incorporate technologies such as drive-by-wire and electronic navigation systems. To help meet these challenges, requires a continuous investment in: R&D and its commercialisation, capital equipment and new technologies, design and engineering capabilities, supply chain improvements and collaboration amongst firms, suppliers and the academic community in design and in the adoption of new technologies or materials.

A report prepared by CM-CIC Securities²⁹ found that assembly costs represent around 10-15 percent of production costs and procurement 80 percent of production costs. Further, it found that a one percent drop in procurement costs can add 48 basis points, on average, to a vehicle manufacturer's operating margin. A 10 percent reduction in assembly costs is needed to achieve the same result. As such, innovations in the supply chain have the potential to assist the vehicle manufacturers lift operating margins more than innovations in the assembly process.

²⁶ This definition includes R&D as well as those innovation activities used by the OECD; *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, Third Edition* (2005).

²⁷ The time-frame and investment costs for the development, engineering and assembly of a model upgrade or a model variant are considerably less.

²⁸ Robinson P; *Autobiography: The Inside Story of Holden's all-new VE Commodore* (2007).

²⁹ CM-CIC Securities; *On the road again: A Financial and Extra-financial Analysis of the Auto Industry* (November 2005).

"Spillover" Benefits

"Spillovers" from automotive manufacturing are the result of the extensive linkages between the industry and other activities. As such, innovation in the automotive sector can have applications and benefits for other industries. For example, investment in innovation in the automotive manufacturing process may require the development of new tooling processes which can be applied to the aerospace and other manufacturing industries. Improvements in the capabilities of these industries can help them to capture new markets.

In addition to technology spillovers, the automotive industry's engineering and skills base can provide a national training ground for many manufacturing and engineering employees in diverse industries. This and employment spillovers are discussed in the labour section.

Assistance for Innovation

The primary forms of assistance for innovation in the automotive industry is funding for R&D. This assistance is through the Automotive Competitiveness and Investment Scheme (ACIS) and the R&D Tax Concession – with the definition of eligible automotive R&D under ACIS being much broader than that used for the R&D Tax Concession. For example, the ACIS definition includes re-engineering and modification of existing products and processes. The industry also receives support under the Cooperative Research Centre, Commercial Ready and Commercialising Emerging Technologies (COMET) programs.

As noted above, ACIS provides the automotive component producers, automotive machine tool and tooling producers and automotive service providers with import duty credits based on the value of investment in approved R&D. In addition, recipients can receive ACIS credits for investment in plant and equipment, an important source of technology uptake.

Also as noted above, ACIS includes the MVP R&D Scheme which is directed at encouraging Australian MVPs to invest in high-end R&D technologies, while collaboration and improvements in the supply chain are being supported by government and industry through the \$7.2 million Supplier Development program. This program is complemented by initiatives such as Automotive Supplier Excellence Australia, which is a collaborative effort including government and industry, and which aims to develop a prioritised sector-wide set of initiatives to raise supplier capabilities to a globally competitive standard.

The R&D Tax Concession is an ongoing scheme designed to increase the level of R&D being conducted by Australian companies. It is broad-based, not industry specific, and market-driven with the applicant entity deciding upon the scope and timing of the R&D. The scheme offers a tax deduction of 125 percent of expenditure incurred on R&D activities (or a 175 percent premium under the R&D Incremental Tax Concession). An 'R&D tax offset' (equivalent to the value of the R&D tax concession) is available to companies with an annual turnover of less than \$5 million.

The Cooperative Research Centre for Advanced Automotive Technology (AutoCRC) aims, through strategic industry-led research collaborations, to deliver smarter, safer, cleaner manufacturing and vehicle technology for Australia's benefit. Its participants are eight leading vehicle and component manufacturers, two state governments and ten research institutions. It is jointly funded by the Australian Government, industry, universities and state governments. The automotive industry also benefits from the work of other CRCs such as the CAST CRC which conducts industry-driven research in metals technology.

Table 2 below outlines the estimated Australian Government budgetary assistance provided to the automotive industry. This "level of assistance provided to automotive R&D accounts for 13 per cent of total business sector innovation support (and will rise to 20 per cent in 2006-07)."³⁰

Table 2: R&D Assistance to Motor Vehicles and Parts Manufacturing – 2005-06 (\$M)

Commercial Ready Program (1)	1.3
COMET Program (1)	<0.1
Cooperative Research Centres (1)	4.6
Premium R&D tax concession (1)	3.8
Preseed fund (1)	0.3
R&D Start (1)	<0.1
R&D tax concession (1)	19.4
ACIS (2)	194.0
Motor Vehicle Producer R&D Scheme (2)	6.6

Sources:

(1) Productivity Commission 2007, *Trade & Assistance Review 2005-06*, Annual Report Series 2005-06, Productivity Commission, Canberra, April (Table A3).

(2) Productivity Commission 2007, *Public Support for Science and Innovation*, Research Report, Productivity Commission, Canberra (Table B1).

The Government has also announced that it will establish a Green Car Innovation Fund worth up to \$500 million over the five years from 2011 to provide incentives for R&D and innovation, to support the use of new engineering solutions and advanced materials to improve fuel efficiency in Australian made vehicles. The Fund will help the industry meet a range of challenges such as climate change and the environment and consumer demand for more fuel-efficient vehicles.

Innovation is also supported through the protection of intellectual property (IP) rights (such as patents and trademarks), thus allowing firms in the automotive industry to capture income from their innovations. In Australia, a strong IP system is supported by IP Australia.

Skills development in the industry is supported by a number of initiatives. These include Automotive Training Australia (ATA) and non-industry specific initiatives such as the apprenticeship system and Australian Technical Colleges. Workplace and skills issues are discussed elsewhere.

³⁰ Productivity Commission 2007, *Public Support for Science and Innovation*, Research Report, Productivity Commission, Canberra (p 439).

Review of the National Innovation System

On 22 January 2008, the Government announced a wide ranging review of Australia's national innovation system to be conducted by an expert panel chaired by Dr Terry Cutler. The establishment of the review is in recognition of the vital role innovation plays in boosting productivity and international competitiveness. As part of the review, the panel is considering all aspects of the CRC Program. It is examining the overall strategic direction of CRCs, looking at the full range of issues, including governance and program design matters, the level and length of funding needed to support the program's objectives, as well as its overall scope and effectiveness. A Green Paper will be prepared by the panel and sent to Government by the end of July 2008. This will be followed by a White Paper response from the Government.

Expenditure on R&D

Business expenditure on research and development (BERD) by the Australian motor vehicle and part manufacturing sector was \$654 million in 2005-06^{31 32}. This represented nearly 17 percent of total manufacturing BERD and 6.5 percent of total BERD. In addition, the R&D intensity³³ of the automotive industry was 11.6 percent in 2005-06. This is around 3 times higher than for manufacturing as a whole and around 9 times higher than for the economy.

However, 89 percent of the automotive sector's BERD was for experimental development, with very little pure or basic strategic research. This suggests the Australian industry is focussed on product development as opposed to the development of new technologies. Around 90 percent of the sector's BERD is sourced from own funds, with the Australian Government the other major funding source.

The automotive sector employed 3,307 researchers, technicians and other supporting staff in undertaking R&D in 2005-06.

The three Australian MVPs and one component company are subsidiaries of international firms which were ranked in the top 10 global R&D spenders in 2006.³⁴ Other Australian component companies are also subsidiaries of international firms with large R&D spends. Some Australian automotive companies may therefore have access to technologies being developed within their parents global networks (and vice versa).

The Australian industry also receives assistance under ACIS for a more broad range of R&D than is permitted for assistance under the R&D Tax Concession as noted above. This definition of R&D is also broader than that used to define BERD. In 2006, the automotive sector invested \$560 million in eligible ACIS R&D. This figure

³¹ Australian Bureau of Statistics; *Research and Experimental Development, Business, Australia, 2005-06* (Catalogue Number 8104.0).

³² The ABS uses the OECD definition of R&D, which is much narrower than the definition of R&D used for ACIS.

³³ As measured by BERD as a proportion of industry value added.

³⁴ http://www.boozallen.com.au/booz_allen_ANZSEA/publications_and_media/in-the-media_press-releases/pr_article_display/2007Innovation1000.

is smaller than BERD as the MVPs can only claim for investment in R&D under the MVP R&D Scheme.

Notwithstanding this, nearly all the major PMV and component manufacturers are subsidiaries of global companies, and the parents' mandates are required for major investments in R&D, equipment and innovation spending. Similarly, finding suitable export opportunities to increase production and hence spread development costs also requires an export mandate.

Environment

Background

There were 14.8 million motor vehicles (including motor cycles) registered in Australia as at 31 March 2007.³⁵ This is an increase of 1.6 million vehicle registrations since March 2003, which has led to an increase in the number of vehicles per 1,000 residents from 663 to 705. The continued increase in the number of vehicles (due to population growth and vehicle density) over time is adversely affecting the quality of the environment as vehicle emissions contribute to both climate change through the emission of greenhouse gases, and to diminishing the quality of the urban environment through the emission of air pollutants and congestion. The environmental impact of vehicular travel on the environment is also affected by vehicle and engine size, age of the vehicle fleet, distances travelled, adoption of technologies and fuel quality.

The manufacture of vehicles and components, as well as the construction of road transport infrastructure can also contribute to greenhouse gas emissions, while the disposal of vehicles and parts at the end of their life can adversely affect the environment. In addition, other factors such as the number of occupants per vehicle and integrated land use and transport planning can help address environmental issues associated with motor vehicle use. However, these issues are beyond the scope of the Terms of Reference for the Review.

Vehicle Emissions

The "Australian transport sector accounts for around 76 million tonnes of Australia's total net greenhouse gas emissions, representing 13.5 per cent of Australia's total emissions"³⁶. This figure has increased by around 30 percent since 1990. Private vehicle use accounts for around 60 percent of all road transport emissions. This figure is likely to increase given the expected growth in the Australian vehicle fleet. For example, "it is predicted that levels in 2010 will be 47 percent higher than 1990 levels"³⁷. This increase is significantly higher than Australia's target under the Kyoto Protocol, which requires Australia to limit greenhouse gas emissions to 8 percent above 1990 levels by 2012.

In addition to contributing to greenhouse gas emissions, vehicles are a major contributing factor to urban air pollution through the emission of carbon monoxide, nitrous oxides, hydrocarbons and other volatile organic compounds (VOCs). For example, in 2002 motor vehicles in the Sydney Region were responsible for 79 percent of nitrous oxides and 44 percent of anthropogenic VOCs³⁸.

The introduction of new fuel quality standards and new vehicle technologies which can maximise these new fuel qualities can help to reduce vehicle emissions. In addition, new motor vehicle abatement technologies (including hybrid and new fuel cell technologies) can also act to reduce vehicle emissions. Development in vehicle

³⁵ Australian Bureau of Statistics; *Motor Vehicle Census, 31 March 2007* (Catalogue Number 9309.0)

³⁶ <http://www.greenhouse.gov.au/fuelguide/environment.html> (2008).

³⁷ <http://www.aaa.asn.au/issues/technology.htm>.

³⁸ NSW Government; *NSW State of the Environment Report 2003*.

abatement technologies and the challenges to the Australian automotive industry posed by these are discussed in the Innovation section.

Globally, the transport sector accounted for 60 percent of the final consumption of oil in 2005, up from 45 percent in 1973³⁹.

Emissions Standards

The Australian Design Rules (ADRs) set the standards that each vehicle model is required to meet. In the environmental context, the ADRs set standards for emissions, noise and fuel consumption labelling. The ADRs do not mandate the use of particular technology, although it has been necessary for vehicle manufacturers to install particular technologies, such as catalytic converters for light petrol vehicles, in order to meet emission limits imposed by the ADRs. The ADRs for emissions standards have been progressively tightened since they were introduced in 1972.

Australia has a commitment to harmonise with the vehicle standards developed by the UN Economic Commission for Europe wherever possible. The emission standards now in place reflect that commitment. For example, the source standard for AD79/01 is UNECE R83/05 (Euro 3) and the source standard for AD79/02 is R83/05 (Euro 4). Notwithstanding this, Australia lags Europe in the introduction of the standards, which can deprive the benefits of advanced technologies to Australian consumers. It can also mean that Australian vehicles may not meet the requirements of some overseas markets.

The emissions performance of vehicles once they are on the road (in-service) is the responsibility of the State and Territory Governments.

Fuel Standards

There is a strong relationship between fuel quality and vehicle emissions technology. The Fuel Quality Standards Act 2000 provides a legislative framework for setting national fuel quality and fuel quality information standards for Australia. The standards address fuel properties that are considered important in facilitating the adoption of emerging vehicle engine and emission control technologies, and in managing ambient levels of pollutants identified as posing health and environmental problems. Fuel quality standards have been made for petrol, diesel, biodiesel and LPG autogas. Fuel quality standards are currently being considered for diesohol and ethanol.

³⁹ International Energy Agency; *Key World Energy Statistics*

Fuel Type

Fuels differ in the amount of carbon and energy they contain as well as other characteristics, with implications for fuel economy and greenhouse emissions. For example, "LPG has lower greenhouse emissions per litre of fuel consumed than petrol, but also has a lower energy content. Therefore equivalent vehicles tend to consume more of LPG than petrol to travel a given distance"⁴⁰. The reverse is the case for diesel, which has a higher energy content and where "engines designed to operate on diesel tend to be far more fuel-efficient than petrol engines"⁴¹.

Biofuels are fuels made from renewable biological feedstocks, with the most common being biodiesel and ethanol - B5 is diesel containing 5 percent biodiesel (usually made from vegetable oils or waste fats) while E10 is petrol containing 10 percent ethanol. A number of Australian Government initiatives support the uptake of biofuels, including the \$37.6 million Biofuels Capital Grants Program to support new or expanded biofuels production capacity; Commonwealth fleet use of E10; and simplification of the ethanol label. There are also many international efforts to increase the use of biofuels, including E85 in the United States, E100 in Brazil and tax incentives for biofuels in Germany.

There are, of course, obstacles to alternative fuel use, including distribution networks and infrastructure, production costs, on-board fuel storage and powertrain developments.

Other Related Standards

ADR81/01 requires new light vehicles for sale to carry a removable fuel consumption label on the windscreen. This label shows the fuel consumption of the car in litres per 100 kilometres and the CO₂ emissions in grams per kilometre. The aim of the labelling is to inform consumers considering the purchase of a new car about fuel consumption, and encourage them to take account of fuel consumption in their decision⁴².

In addition, the Green Vehicle Guide provides information about the environmental performance of new light vehicles (up to 3.5 tonnes gross vehicle mass) sold in Australia since mid-2004. It is updated regularly as new models come onto the market⁴³.

Consumer Preference

Changing consumer preferences has seen an increase in demand for smaller cars and for large luxury passenger motor vehicles and SUVs. Rising fuel prices, as well as more environmentally conscious consumers, may be a factor behind the growth in the light car segment of new car sales as could the increasing affordability of such vehicles. However, it is not possible to suggest that rising fuel prices was the most significant factor behind the drop in sales of large PMVs given the growth in the upper large and luxury PMV and luxury SUV segments of the market.

⁴⁰ <http://www.greenhouse.gov.au/fuelguide/environment.html>.

⁴¹ <http://www.greenhouse.gov.au/fuelguide/environment.html>.

⁴² <http://www.infrastructure.gov.au/roads/environment/impact/index.aspx>.

⁴³ <http://www.infrastructure.gov.au/roads/environment/impact/index.aspx>.

Distance Travelled and Fuel Consumption

Motor vehicles travelled an estimated 209,405 million kilometres in the 12 months to 31 October 2006, or an average 14,600 kilometres in that year⁴⁴. Passenger motor vehicles accounted for nearly 75 percent of total distance travelled. Personal and other use accounted for over one-half of the total kilometres travelled by passenger vehicles, followed by travel to and from work (29.3 percent) and business use (19.1 percent).

The average rate of fuel consumption for all Australian registered vehicles in the year ended 31 October 2006 was 13.8 litres per kilometre, slightly higher than the 13.6 litres per kilometre for the year ended 31 October 2004.

Age of the Vehicle Fleet

The age of the vehicle fleet has continued to decrease and was 10.0 years as at March 2007. This can have a positive impact on the level of automotive-related greenhouse gas emissions as older vehicles tend to have less emission abatement technologies than recently manufactured vehicles. Still, these changes, which could be partially attributed to regulatory changes (such as the removal from the market of leaded petrol) and the increasing affordability of motor vehicles, may not offset negative environmental impacts of the growth in the overall vehicle fleet.

International Treaties and Commitments

On 3 December 2007, Prime Minister Rudd signed the instrument of ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. As part of this agreement, Australia has set a target to reduce greenhouse gas emissions by 60 per cent on 2000 levels by 2050⁴⁵. A 60 percent reduction in 1990 emissions, applied uniformly across the transport sector, implies PMV emissions of 14 million tonnes of CO₂ in 2050 - a challenging 70 percent reduction over current levels.

Emissions Trading Scheme

The Australian Government has announced the establishment of an emissions trading scheme as part of an effective framework for meeting the climate change challenge. The scheme contains five key elements: (i) it must be a cap and trade scheme to be internationally consistent; (ii) it must effectively reduce emissions; (iii) it must be economically responsible; (iv) it must be fair; and (v) it must recognise the need to act now.

Work should progress on developing a national emissions trading scheme starting no later than 2010.

⁴⁴ Australian Bureau of Statistics; *Survey of Motor Vehicle Use, Australia* (Catalogue Number 9208.0).

⁴⁵ <http://www.greenhouse.gov.au/international/kyoto/index.html>.

Vehicle Emissions Targets

On 19 December 2007, the European Commission adopted a proposal for legislation to reduce the average CO₂ emissions of new passenger cars in order for the European Union to deliver on its Kyoto Protocol commitments. Passenger motor vehicles account for about 12 percent of the European Union's carbon emissions. The proposal is to reduce average emissions of CO₂ from new passenger cars to 130 grams per kilometre by 2012, down from the currently average emissions of around 160 grams per kilometre (and much higher than the current voluntary target of 140 grams per kilometre by 2008). The proposal is complemented by measures which would contribute to a further emissions cut of 10 grams per kilometre which would reduce the overall average emissions of the new car fleet to meet the EU objective of 120grams of CO₂ per kilometre. These include efficiency improvements for car components with the highest impact on fuel consumption, such as tyres and air conditioning systems⁴⁶.

To help it meets its Kyoto Protocol commitments, Japan has set carmakers the challenge of achieving a fuel efficiency performance, which by 2015 must be more than 20 percent better than in 2004. This translates into a CO₂ target of 138 grams of CO₂ per kilometre. The original targets for passenger motor vehicles were intended to achieve an improvement in fuel economy of 23 percent in 2010 compared to the 1995 baseline.

New Zealand has released a discussion paper on a Vehicle Fuel Economy Standard for all new and used light vehicles entering the fleet. In 2005, road transport represented 16 per cent of New Zealand's total greenhouse gas emissions⁴⁷. The proposal is to help achieve New Zealand's emissions target of 170g of CO₂ per kilometre by 2015 for new light vehicles entering the fleet. The current average fuel economy of light vehicles entering New Zealand is about 210 grams of CO₂ per kilometre.

In 2003, the Government and the Federal Chamber of Automotive Industries (FCAI) agreed on a new national average fuel consumption (NAFC) target for new petrol-engined cars of 6.8 litres per 100 kilometres by 2010 (a 17.9 percent improvement over 2001 to 2010). In 2003, agreement was reached between FCAI and the Government for the industry to reduce fleet average fuel consumption for passenger cars by 18 percent by 2010 (to 6.8 litres per 100 kilometres), based on the fuel consumption of the 2002 vehicle fleet. This target is voluntary. It has been estimated that the actual national average carbon emissions for all new light vehicles in Australia was around 250 grams per kilometre in 2002.

⁴⁶ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1965>.

⁴⁷ Tizard J; *Fuel economy standard proposed to further reduce greenhouse gas emissions* (Press Release, 31 January, 2008).

Vehicle Excises

A number of countries impose excises on the sale of new passenger vehicles based on engine capacity while others, such as the UK, impose vehicle excise duties on car registration. In 2001, the UK Government introduced a new system for all cars registered since March 2001. "For cars registered before 1 March 2001 the system is based on engine size. For cars registered on or after 1 March 2001, Vehicle Excise Duty is based upon a calculation of their CO₂ emissions and their fuel type. The principle behind the system is 'the less a car pollutes, the less you pay'"⁴⁸.

The UK also imposes a company car tax on individuals where they are provided a car as part of their employment and where the car is made available to them for private use. The tax payable is broadly determined by three factors: the list price of the car plus any accessories; the CO₂ emissions of the car; and, the fuel type of the car.

End-of-Life Vehicle (ELV) Recycling

The disposal of a vehicle at its end of life can have a detrimental impact on the environment in terms of land fill usage and environmental releases (including through incineration). Factors such as these led to the EU issuing a directive on end-of-life vehicle recycling which stipulated that by 1 January 2006 a minimum of 85 percent (on average) of ELVs by weight must be recycled and recovered, and a minimum of 80 percent by weight on average must be reused or recycled. Manufacturers are responsible for achieving these goals. This measure does, however, add costs to both EU vehicle manufacturers and exporters to the EU.

Other

There are other factors such as the number of occupants per vehicle, integrated land use and transport planning that can help address environmental issues associated with motor vehicle use, while the 'peak oil' theory and associated rising oil prices may drive technological change and alternative fuel use. However, these issues are beyond the scope of the Review.

⁴⁸ http://www.rac.co.uk/web/knowhow/owning_a_car/running_costs/car_tax_ved.

Employment, Skills and Workplace Relations

Introduction

The automotive industry is a major employer in Australia. However, the industry is facing international and domestic competitive pressures which will continue to shape its size, structure and workplace practices.

Cost pressures in manufacturing generally are driving an international trend towards moving production to lower labour cost centres such as Asia. Indeed, lower overseas labour costs have been cited as the issue which has the most affect on the competitiveness of the Victorian automotive components industry⁴⁹. At the same time, a strong labour market in Australia has placed upward pressures on domestic costs across a range of in-demand skill categories.

Employment

As at November 2007, the automotive industry employed 61,200 people, which represents a substantial reduction over the last several years as shown in Chart 11.

In the past two years, a number of closures occurred in the automotive component sector. There are no guarantees that employment levels have "plateaued", and employment adjustment and transition will be continuing themes. The long term employment outlook "will be largely influenced by domestic and international demand (for both locally produced vehicles and components), developments in the exchange rate and, importantly, productivity growth"⁵⁰.

Within the automotive industry, motor vehicle manufacturing was the main employer (accounting for 40 percent of employment in the automotive industry). It was followed by automotive component manufacturing (32 percent); motor vehicle body manufacturing (23 percent); and automotive electrical and instrument manufacturing (5 percent).

Wages and Salaries

Wages and salaries in the automotive industry rose by 24 percent (from about \$44,000 to \$55,000) in the five years to 2006. The corresponding increase for manufacturing was 17 percent (from \$41,000 to \$48,000). In 2006, wages and salaries in the automotive industry were 14 percent higher than in manufacturing in general.⁵¹

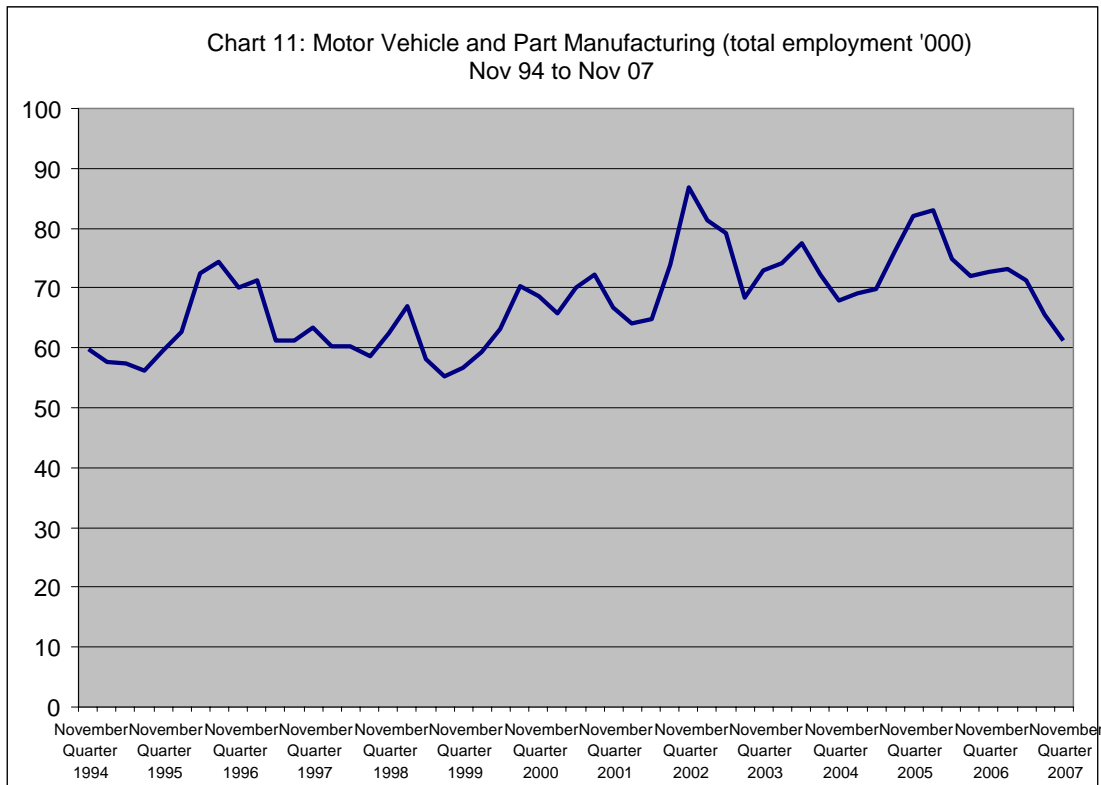
⁴⁹ Australian Industry Group (AiG) and Federation of Automotive Products Manufacturers (FAPM), *The Victorian Components Industry, competitiveness, profitability, and future strategies*, http://www.aigroup.asn.au/aigroup/pdf/economics/surveys_and_reports/2838_VicAutoReport_KPMGv2.pdf, 2005, p.17.

⁵⁰ DEWR, Submission No.11 to the HoR Inquiry into Employment in the Automotive Component Manufacturing Sector, <http://www.aph.gov.au/house/committee/ewrwp/automanufacturing/subs/sub11.pdf>, 2006, p.17.

⁵¹ Australian Bureau of Statistics; *Manufacturing Industry, Australia, 2005-06* (Catalogue Number 8221.0)

Although wages and salaries were higher overall in the automotive industry, there was significant variation within the industry itself. For example, wages and salaries were:

- highest amongst motor vehicle manufacturing employees (\$63,000 in 2006), and 32 percent higher than the average for manufacturing generally; and
- lowest amongst motor vehicle body manufacturing employees (\$38,000 in 2006), or 31 percent lower than the broader automotive industry and 21 percent lower than manufacturing.



Skills

Competitive pressures, combined with the introduction of new technologies and production processes, require the renewal and upgrading of workforce skills through a continuous improvement process. Skills levels, in terms of post-school educational and vocational qualifications, have risen in the automotive industry and are higher than for both manufacturing and all industries^{52 53}.

With unemployment in Australia at a long term low, there is competition for skilled workers. However, demand is not uniform across skill categories and "the largest

⁵² Australian Bureau of Statistics, unpublished data for 1996 and 2001, cited by the PC, op cit, p.245.

⁵³ House of Representatives (HoR) Standing Committee on Employment, Workplace Relations and Workforce Participation, *Shifting Gears – Employment in the automotive components manufacturing industry*, <http://www.aph.gov.au/house/committee/ewrwp/automufacturing/report.htm>, 2006, p.40.

number of occupations which have good job prospects require skills you can only get through post school education and training"⁵⁴.

In 2005, particular shortages were identified in the Victorian automotive components sector for design and process engineers, as well as for tradespeople including electricians, fitters and tool-makers. Furthermore, perceptions that the industry was unattractive, lacking glamour and having an uncertain future were acting as disincentives amongst potential recruits.⁵⁵

More recently, shortages in "some specialist skills...e.g. electricians/CAD-CAM draftspeople" were identified as having a medium impact on motor vehicle producers, and "greater difficulty in attracting skilled workers and tradespeople" was having a high impact on automotive component producers⁵⁶.

The automotive industry is not unique in experiencing skills shortages. In the manufacturing sector, 47 percent per cent of employers are having some or a lot of difficulty in recruiting staff. Nonetheless, 89 percent of manufacturing employers consider staff skill levels are adequate or exceed their organisational needs.⁵⁷

On-the-job Training

Education and training is provided through a combination of institutions (e.g. schools, universities, TAFEs), employer on-the-job training, and industry-specific relationships with training providers. Some automotive industry employers are also registered training providers.

Automotive Training Australia is responsible for the Automotive Manufacturing Training Package AUM00. The Package covers "all aspects of vehicle manufacturing including vehicle development and testing, manufacture of body components and engines, assembly of motor vehicles, plant and equipment maintenance and spare parts warehousing and distribution"⁵⁸.

It has also been noted that "although formal training mechanisms are an important avenue for entrance into a career in the automotive industry, low participant numbers indicate that industry investment is primarily in on-the-job and in-house training... The reliance on on-the-job training means that industry/provider partnerships are an essential component to the provision of training."⁵⁹

Expenditure on training in the automotive components sector is marginally higher than for manufacturing (1.3 and 1.2 percent of average wages respectively).

⁵⁴ Department of Employment and Workplace Relations (DEWR), *Australian Jobs 2007*, <http://www.workplace.gov.au/workplace/Publications/LabourMarketAnalysis/AustralianJobs.htm>, 2007, p.20.

⁵⁵ AiG and FAPM, op cit., p.28

⁵⁶ Automotive Training Australia (ATA), *Automotive Industry Skills Report October 2007*, <http://www.automotivetraining.org.au/FinalVersionNov07.pdf>, 2007, p.21.

⁵⁷ National Centre for Vocational Education Research, *Australian vocational education and training statistics, Employers' use and views of the VET system*, <http://www.ncver.edu.au/statistics/surveys/seuv07/su07030.pdf>, 2007, p.7.

⁵⁸ ATA, op cit, p.15.

⁵⁹ HoR, op cit, pp.44-45.

However, the emphasis may be on training to meet "regulatory requirements (such as occupational health and safety training), and internal processes" instead of skills development.⁶⁰

Workplace Reform

Flexible work practices and a stable workplace relations environment are important, particularly as motor vehicle producers rely on lean manufacturing techniques and delivery of components on a just-in-time basis.

Disruptions to production at a key component supplier or at a motor vehicle producer can lead rapidly to the shutdown of the vehicle assembly line and to shutdowns through the supply chain. Consequently, stoppages can be very expensive in terms of lost production, penalties for delayed delivery, idle capital, lost wages, lost sales and the damage to reputation as a reliable supplier.

However given the competitive pressures the industry is experiencing, a greater emphasis on improving productivity, reforming work/management practices and promoting a productive workplace culture will be required if the Australian industry is to remain competitive in the longer term. While volume, scale economies and innovation (broadly defined) remain the key determinant of productivity in the industry, more needs to be done to encourage high performance workplaces and cost competitive supply chains. The Australian industry cannot escape this imperative and must rise to meet the challenge.

From 1997 to 2006, there was a general downwards trend for the number of working days lost due to industrial disputes for the metal product and machinery and equipment sectors, of which the automotive sector is a part. However, there was significant fluctuation from year to year. Furthermore, the overall rate was significantly higher in most years than all industries.⁶¹ Whilst some care needs to be exercised in comparing industries and the impacts of disputes, the enterprise bargaining cycle and the higher rate of union membership are factors influencing the timing and rate of disputation in the automotive industry⁶².

Labour Adjustment Packages

Current government policy provides that all workers who have had their retrenchment confirmed are eligible for immediate job search support assistance with an employment service provider. In some cases, depending on the level of need, individuals may immediately qualify for an additional level of support.

In particular situations the government has decided to provide additional assistance to retrenched employees. In making these decisions, factors such as the circumstances and likely impact of the situation for the individuals, local communities and local labour markets are considered. For example, labour adjustment packages have

⁶⁰ Ibid.

⁶¹ Australian Bureau of Statistics; *Industrial Disputes, Australia, Sep 2007* (Catalogue Number 6321.0.55.001)

⁶² PC, op cit, pp.253-254.

been provided to assist employees who work in industries that may be affected by changes to government policy. This includes the automotive industry.

The level of assistance varies between packages but generally involves providing affected workers with access to additional training and employment services. Additional assistance such as relocation assistance and assistance to start a small business have also been provided. States also provide further support in regards to employment services and training.

Vehicle Safety

Background

A demand by consumers for safer vehicles and by government for reduced road trauma has led to increases in the safety features of vehicles and more stringent vehicle safety standards. Such safety features over the past decades have included the introduction of seat belts, frontal crumple zones, air bags and traction control.

Improved driver behaviour and road infrastructure can also contribute to reducing road accidents. However, these and related issues are beyond the scope of the review.

Road Trauma

The Australian Transport Safety Bureau (ATSB) reported that there have 171,000 road accident fatalities in Australia, and in "addition to the burden of personal suffering, the monetary cost of crashes is in the order of \$15 billion per annum"⁶³. Notwithstanding this, the fatality rate has fallen from 30.4 per 100,000 population in 1970 to 8.8 deaths per 100,000 population in 2002⁶⁴. This has been bought about by improved vehicle safety standards and features, including from new technologies, driver behaviour initiatives (such as random breath testing) and better roads.

Safety Standards

Government responsibility for road safety is shared, with the states and territories responsible for road traffic regulation and enforcement through to driver training and licensing. The Australian Government administers the *Motor Vehicle Standards Act*, which requires vehicles to meet the national standards covering safety. These standards are the Australian Design Rules (ADRs) and cover nearly all parts of vehicle manufacture. For example, components such as head restraints, safety glass, tyres, lights, protective devices and rear vision mirrors are all covered by the standards.

International vehicle safety standards are governed by two different sets of regulations. The United Nations Economic Commission for Europe (UNECE) 1958 Agreement regulations and the Global Technical Regulations. Australia is a signatory to the first of these. As noted above, the Government's policy is to harmonise the national vehicle safety standards with international regulations where possible and consideration is given to the adoption of the international regulations of the UNECE. The majority of the ADRs are aligned with UNECE regulations. The US and Canada are not signatories to the UNECE 1958 agreement as the legal framework cannot recognise mutual recognition agreements between governments. In the US, regulations concerning motor vehicle safety are issued by the National Highway Traffic Safety Administration.

⁶³ <http://www.atsb.gov.au/road/safety.aspx>.

⁶⁴ <http://www.atsb.gov.au/road/safety.aspx>.

Differences Between the ADRs and UNECE Regulations

Harmonisation of Australian standards with international standards, such as UNECE, can facilitate market access for Australian automotive products. Standards can also be updated to take advantage of advances in technology which improve safety. It is recognised, however, that the introduction of more stringent standards can add to the cost of manufacture and to the new car purchase price.

Differences in standards can act as a technical barrier to trade (TBTs), and there are differences between the ADRs and the UNECE Regulations. For example, "ADR 45 ("Lighting & Light-signaling Devices not covered by ECE Regulations") impose additional requirements on manufacturers, that could have characteristics of TBTs, to the extent that they are more trade restrictive than necessary to improve vehicle safety."⁶⁵ There are also other safety-related differences, including in relation to other standards such as the physical dimensions tests for passenger car tyres. Differences in emissions standards are discussed in the Environment section.

Standards and Technology Advances

There have been many advances in vehicle safety technologies and many of these have been incorporated into the ADRs. However, many new technologies are introduced into prestige-type (and priced) vehicles first before flowing into most new models. This partly reflects the cost of new technologies, but could also be partially attributed to the ADRs (and the UNECE regulations) not changing to reflect the safety benefits of such technologies.

Two such technologies include electronic stability control (ESC) and head protection technology such as side curtain air bags. ESC helps drivers to avoid crashes by reducing the danger of skidding, or losing control as a result of oversteering. It uses computer control technology to apply individual brakes to bring the car safely back on track, without the danger of fishtailing. Side curtain airbags, which deploy from the roof-rail above the door, provide head and neck protection for front and rear seat passengers, particularly in the event of a side impact crash.

An Australasian study conducted by the Monash University Accident Research Centre has confirmed ESC systems reduce the risk of single vehicle crashes by up to 50 percent. The US-based Insurance Institute of Highway Safety estimated that side curtain airbags could reduce deaths to drivers struck on the driver's side of the vehicle by 45 percent.

Several Australian-made models have ESC as standard, but the full curtain side airbags are standard only on a limited number of models. As a result, and as indicated above, the incorporation of these technologies into the ADRs may increase costs to the local manufacturers, potentially decreasing their competitiveness. In addition, the UNECE is still to develop a directive on ESC.

⁶⁵ Rand Science Technology; *Measuring Economic Effects of Technical Barriers to Trade on US Exporters* (August 2004).

There has also been concern expressed by automotive groups about the lack of ADRs for technologies like those outlined above leading to "de-specification" of new cars sold in Australia. Increasing the safety features of vehicles can lead to weight increases, which can have detrimental environmental effects. They can also lead to price increases for consumers.