

Introduction

The paper begins with an observation that the output performance of Australia's automotive manufacturing industry is very poor compared to that of the similar nations within its cohort.

An explanation of the reasons for the under-performance of the industry forms the main part of the paper. Beginning with the obvious fact that the Australian industry does not build enough of the types of car that customers currently want to buy, the background to the product-choice decisions made by the industry managers is outlined. This leads to a consideration of the role of foreign ownership of the prime firms in the industry as a factor accounting for its poor overall performance. Following from this, the role of government policy in the historical development of automotive manufacturing is presented, firstly in the case of other important automotive manufacturing nations, and finally in Australia.

The approach of this paper is mainly historical; it concentrates on matters long past. This is because the best way to gain an understanding of the present malaise in Australian automotive manufacturing is to look at the path it has taken to arrive at its present destination.

The fact is that the defects of the Australian industry were put in place before any of the current decision-makers were born; stated simply, the Australian industry was constituted for failure from its beginnings. If blame for the initial flaw, and the subsequent failure to correct it, must be apportioned, and this seems to be a lamentable requirement of all current discourse, then it should be given to the succession of government policy makers who failed to act to secure the industry in the national interest.

The Australian governing class has done many things well, but industrial policy has not been one of them. The history of Australian economic development is littered with the debris of failed industries, lost for the want of a nail of sound policy. The predominant foreign manufacturing firms operating here are not to blame for the parlous state of the industry; they are what they are, they work for the benefit of their managers and owners, not, other than by coincidence, for the interests of Australia or its people.

There is a fairly standard three-step procedure for setting up a national automotive industry. The first step, *establishment*, is to facilitate a domestically owned and managed national core firm. The second step, *nurture*, is to provide the financial and regulatory support that the core firm needs, in strict consideration of it making progress on output and productivity, while hindering, as necessary, the foreign firms seeking market entry or production sites that will wish it ill. The final step, *preservation*, is gained when the national core firm achieves technical maturity and international competitiveness; it is for government to withdraw and maintain a watching brief, intervening in the industry only occasionally, but as necessary, to deflect new threats from existing or emergent competitors.

In conclusion, the paper suggests that the industry is worth saving, but that a continuation of the practice of paying tribute to reluctant foreign participants is the wrong policy. Instead, the way forward is to reboot a major part of the industry; to facilitate a national firm and support it to maturity. Given the breadth and depth of Australian technical skills, the time to progress to maturity would be short. Public funding will be needed, but it will not be needed indefinitely.

The Australian automotive industry

Australian automotive manufacturing is in deep trouble. About 1,100,000 new motor vehicles are sold in Australia each year and yet the local industry produces barely 200,000 units, about the same number that it built in 1957. At its output peak, in 1974, the Australian automotive industry built more than double the number of units than it did in 2012.

Not only has Australian production fallen to the level of more than half a century ago, when the market was less than a quarter of its current size, the locally manufactured share of each vehicle is now much smaller than it was then. In the late 1950s local content in Australian cars was close to 100%. Today, a large and increasing proportion of the materials and components used in all Australian-assembled cars is imported.

What about the industry leaders? In marked contrast to Australia, Germany produced over five times the number of cars in 2012 than it did in 1957. In addition to more than 5,600,000 units of domestic production, German-owned automotive firms built a further 7,000,000 units in foreign locations. In 1957 the Australian industry produced more than four times the number of cars made in Japan in that year and accounted for 2.4% of global car production. By 2012 the Australian share of world output had fallen by 90%, to just 0.25%.

The rate of decline of the Australian industry is gathering pace; between 2000 and 2012 Australia slumped from 19th to 29th place in world automotive production. In terms of volume produced, domestic market share and its output ranking in the world, the Australian automotive manufacturing industry is performing very poorly indeed.

What level of output should the Australian industry be achieving? The table below compares Australian production performance with a group of similar automotive manufacturing nations.¹

	Motor cars produced	Population	Per capita GDP, USD	Units per million of population
Australia	209,730	22,262,501	42,400	9,421
Belgium	541,874	10,444,268	38,100	51,882
Canada	2,463,732	34,568,211	41,500	71,272
France	1,967,765	65,951,611	35,500	29,836
Germany	5,649,269	81,147,265	39,100	69,617
Italy	671,768	61,482,297	30,100	10,926
Japan	9,942,711	127,253,075	36,200	78,133
South Korea	4,557,738	48,955,203	32,400	93,100
Spain	1,979,179	47,370,542	30,400	41,781
Sweden	162,814	9,119,423	41,700	17,854
Taiwan	339,038	23,299,716	38,500	14,551
UK	1,576,945	63,395,574	36,700	24,875
USA	10,328,884	316,668,567	49,800	32,617

¹ Automotive manufacturing nations with per capita GDP above 30,000 USD, mature markets and advanced technical capabilities. Production data source OICA 2012, population and GDP estimates, CIA World Fact Book

This data shows, in per capita output terms, that South Korea, Japan and Germany are the most successful motor car producing nations. If the Australian industry had been able to match the average per capita domestic output performance of this group, it would have built over 1,730,000 units in 2012; more than eight times the output achieved.

On the reasonable expectation that the Australian industry should have been able to match the average per capita output performance of the entire group, then it would have built about 934,000 units in 2012, or nearly four and a half times the output achieved. Even by matching the per capita output of the bottom three producers, apart from Australia, the industry would have produced over 320,000 units, or more than one and a half times more than it achieved.

The conclusion to be drawn from the production statistics is that the output performance of the Australian industry is unsatisfactory when compared to the nations in its peer group. In the league table of mature, high-cost automotive manufacturing nations, the Australian industry takes the wooden spoon.

The Australian automotive industry should be much larger than it is. Given the maturity, size and significance of the market and that Australians have been designing and building complete motor cars for more than a hundred years, producing car bodies in large numbers since the 1920s and mass producing complete motor vehicles since the late 1940s, the industry should be producing at a per capita rate at least equal to the mean of the group of similar nations. This would suggest that, on current data, the Australian industry should have an annual output of about 900,000 units.

It is worth noting that in the era of local content plans, tariffs and quotas that preceded the period of trade liberalisation, Australian production was at or above 80% of domestic sales. Had the regime of industry protection been retained, Australian production, at the current market size, would now be, *ceteris paribus*, about 900,000 units.

The performance of the Australian automotive industry

The data provided in the previous section suggests a good rule of thumb for measuring the performance of a national automotive industry; it should produce an output roughly equal to the number of units sold in the domestic market. This does not have to mean that domestic buyers are deprived of a choice of imports, rather that an industry performing at an average level should be able to find at least enough export volume to offset the share of the local market given over to imports. The top performing national industries actually do much better than this, but the Australian industry falls well short; total output, shared between local and export sales, is equivalent to less than a fifth of the units sold in the domestic market.

The obvious explanation for the poor performance of the Australian industry is that the range of locally built products is too narrow to contend for a major share of the domestic market. Local products dominate large car sales, but that market segment is much smaller than it used to be and there are few other participants. Apart from large cars, Holden assembles a small/medium size front wheel drive (FWD) car and Ford builds a large SUV, although not for much longer. Toyota builds a global FWD medium/large car that is also produced in several other locations.

Although Toyota does not build unique models in Australia, the company occupies an important place, both as a major exporter and, given that firm's unsurpassed prowess in manufacturing, as a beneficial agent of quality and productivity improvement for the industry.

For the practise of local technical and organisational skills and the wide participation of local supplier firms, the two Australian designed large rear wheel drive (RWD) ranges based on the Commodore and Falcon platforms have been the most important part of the industry. These models engage the highest level of design, engineering and implementation skills that the Australian industry can muster. The fact is that without products like these the local industry has no unique capability nor any compelling reason for its continued existence; it is simply an expensive assembly point for a global industry that has better alternatives elsewhere.

The future of any uniquely Australian product ranges is bleak because the market for large cars has collapsed; buyers of this car size prefer SUVs or 4WDs and local production of this type is limited to one ageing model. Export potential for the Australian large cars is limited and the foreign owners of the local firms have no serious interest in finding markets for them, nor of funding the design, engineering and construction refinements needed for them to be fully internationally competitive.

In most foreign markets taxes and regulations are designed to favour small cars as a means of conserving fuel and road space. This has the effect of placing large cars, like Commodore and Falcon, into the luxury class, where they must compete with premium models that offer higher technical specification, more refined construction and prestigious brand values. Examples of cars in this class are the BMW 5 series and Mercedes Benz E class, models that are much less expensive in foreign markets than they are in Australia.² The Commodore and Falcon derived models are not competitive in the premium class, although this does not mean that the local designs are bad cars; on the contrary, in some areas their performance is close to that of the more expensive brands.

Australian designed cars perform very well to their intended purpose, but they are not beyond criticism. The local cars, although now greatly improved, have generally lacked refinement in the quality of interiors, fit and finish, attention to design detail, the precision of mouldings and pressings, in material choices and the sense-aesthetics of touch, feel and texture compared to premium and higher level mainstream brands. These shortcomings have contributed to a gestalt perception in the minds of potential customers that Australian cars are not up to the standard of imports. The fact remains that despite many years of quality management work in the industry, the manufacturers of the Australian-designed cars need to do more.³ Each generation may have

² In 2013, the Australian price of a BMW 535i is \$126,500 and the equivalent Mercedes Benz, the E 350, is \$145,000. The price of similarly specified versions of these models in the UK or USA in 2013 is about \$65,000. The high Australian price is not due to tariffs or luxury car tax as is commonly supposed. The Australian import tariff is 5% and the luxury car tax threshold for 2012/13 is set at \$59,133.

³ American firms were slow to respond to the Japanese-led transformation of quality management practices in the automotive industry. The Japanese approach was to apply obsessive, quantitative and highly methodical techniques to the eradication of defects. A central aspect of this approach was the diligence that it attached to the reduction of variation in manufacturing processes. Paradoxically, this strategy was based on what had formerly been the hallmark of American practice, but the Japanese firms moved on to an entirely different level, extending close tolerancing beyond purely functional mechanical elements to parts not traditionally included, such as body pressings and mouldings. This led, in due course, to significant productivity gains; on the inputs side through material savings,

improved on its predecessor, but other brands are moving forward too and the locals always seem to be working to catch up; getting right to the front of the leading peloton has so far been beyond their grasp.

Despite these criticisms, the technical capability demonstrated by the industry is well above the level that its small size would suggest. It is fair to say that, given adequate resources and a serious commitment to achieving it, Australian designed cars could be brought up to the standard of the best automotive manufacturing nations without much difficulty. The skills and capabilities needed to achieve this are already embedded in the industry; they have been hard won, they have taken many decades to develop, are a valuable asset for the nation and should not be lightly thrown away. The present problem for the Australian industry is not a lack of local talent or ability, nor any intrinsic set of factors preventing Australia from having a larger and more efficient automotive industry, it is that there are few markets left for the type of cars that the parent firms have permitted their local subsidiaries to design, build or export.

The question is then, why have the local branches of American firms persevered with large cars for so long? One obvious reason is that large cars provide better margins; building small cars, other than in high volume, is not very profitable. A less obvious, but important, reason is that the Australian staff of the local firms have different interests from their foreign principals. The Australian managers⁴ have always wanted to design and build unique motor cars because that has been the best way to preserve their careers and their industry; they understand that a local industry reduced to an assembly facility for foreign designs would, in the absence of strong protectionist policies, have little future.

The problem for the Australian managers is that building special designs for the local market requires a large investment. To gain corporate approval for such an outlay, a convincing case as to the uniqueness of local tastes and conditions, and the commercial value of accommodating them, has to be made. The principals of the global firms, naturally enough, seek to build an optimal product range; ideally they want world car designs to spread the development and component costs over the broadest possible production base and to subdue any tendencies towards independent action by their subsidiaries. While sceptical of the claims to uniqueness made by their Australian agents, the principals have, in the past, deferred to their arguments, while periodically attempting to force the issue in their preferred direction; for example with the decision to introduce the Holden Commodore, a German Opel design, in the 1970s and the fairly strenuous efforts by Ford to replace Falcon with an American Taurus in the 1990s.

The main argument advanced by Australians for unique local designs eventually settled on the claim that commodious vehicles, muscular engines and RWD chassis were strong local preferences. In other parts of the world the transverse engine FWD layout, popularised by the Alec Issigonis designed Morris Mini of 1959, had become the ascendant technical architecture

reduced inventory, scrap reduction and ease of assembly and on the outputs side in enhanced value through higher perceived quality and lower defect rates. The somewhat tardy, dismissive, business-as-usual response by the American firms to the Japanese challenge was a major factor accounting for the relative decline of the US automotive industry, resulting in a loss of esteem from which it is yet to recover.

⁴ Managers below a certain level, that is. One of the tests set for aspiring executives at American automotive firms has been that of their fundamental loyalty; is it to company or to country? Those that pass the test, from the company point of view, can go on to international careers, those that fail will be left at home.

and by the 1980s the previously predominant RWD configurations were rapidly disappearing. During the period that this tectonic shift in vehicle design practise was taking place, Australia was dismantling protection for its automotive industry. The foreign principals took a long view of their local position and concluded that better opportunities now lay elsewhere and, as a result, the Australian subsidiaries did not get the investment needed for complete manufacture of cars of the new type.

Australian design preferences were therefore largely selected by necessity; the requirement to propose and build products that were feasible within the plant already in place. If the local managers had at any time during the last three decades conceded to their foreign principals that Australians would accept similar cars to those produced elsewhere, the axe would have fallen immediately on the prospect of any more unique local designs. Thus the real purpose of the arguments made by Australian managers for large and powerful RWD cars was that it was the best way to deflect head office imposition of an imported global FWD design.⁵

An emergent problem presented to the advocates of local designs was that 'small' cars were steadily growing in size, mass and power. This progressively undermined the case for unique to Australia models.

The most popular size for a motor car has been remarkably constant in Australia. In 1964 the best selling local model was the EH Holden. Although smaller than a contemporary American compact or mid-size, like a Chevy II or Chevelle, an EH Holden would have been considered a large car in Britain, Europe or Japan; it was almost as large as a Ford Zodiac, Taunus P5 or Toyota Crown of the same era. In 1964, a small family car would have been classed as

⁵ Notwithstanding these principal-agent intrigues, Australian engineers have been on solid technical ground in making the case for RWD. A front-engine RWD (FR) layout disperses heavy power train elements - the engine, transmission, driveshaft and driven axle - throughout the vehicle structure, enabling the technical ideal of mass equalisation between the front and rear axles to be achieved. Conversely, the most common FWD (FF) chassis, the transverse-engine layout, combines the power train components en bloc and places them above and ahead of the front axle. Although a RWD layout is heavier - because of the need for disaggregated housings, more elaborate mountings, a long drive shaft and heavier body construction - more of the mass is set within the wheelbase. This reduces the vehicle's polar moment of inertia which improves its transient response to steering inputs. All FWD chassis are nose heavy, typically placing 65% of the vehicle's mass on to the front wheels. Poor weight distribution has an adverse effect on dynamic performance, made worse when the centre of mass of the power train is placed ahead of the front axle. Understeer, the tendency of the car to resist directional change to steering inputs, is the default handling characteristic of a nose heavy chassis. As the FWD chassis transmits power through the steered wheels, torque steer, the tendency for the car to pull to one side under acceleration, is introduced in designs where the driven wheels' steering axis and the centre of the tyre contact patch do not intersect. The simple McPherson strut front suspension designs commonly used in FWD cars generally suffer from this defect. As a car's centre of gravity is situated above the axle centreline, the inertial weight transfer effect under acceleration gives RWD better adhesion on the driven wheels than FWD. Other performance attributes compromised by FWD include limited front suspension travel, high wear rates on drive shaft CV joints, a large turning circle and poor tactile feedback on road surfaces. Certainly, in mitigation, chassis engineers have become adept at masking and compensating for the inherent defects of FWD. Despite their best efforts, however, the fact remains that driving the rear wheels instead of the front provides a car with better dynamic performance; superior poise, balance and braking, more nimble and responsive handling and better traction on launch. Because RWD chassis are inherently superior to FWD, virtually all of the world's prestige and sports cars - Rolls Royce, Bentley, Mercedes Benz, BMW, Lexus, Jaguar, Maserati, Aston Martin and Ferrari - have adopted it. On the other hand, FWDs have better packaging efficiency, are cheaper and simpler to build, lighter and, although dynamically inferior, these deficiencies, while obvious to an expert, are generally beyond the discernment of an average driver. In a small, light car with engine torque of 200 Nm or less, used mainly in urban areas, FWD is fine. The fact that Commodore and Falcon offer a similar mechanical layout to the world's best cars at a low price is somewhat anachronistic, given that RWD chassis are now, and likely to be in future, confined to either sports cars or prestige marques.

something like a BMC ADO 16, VW Beetle or Mazda 800; models weighing 850kg or less, under four metres in length with engines of about 40kW.⁶

In 2012, the best selling car in Australia was the Mazda 3; a model now classified as a small family car. A comparison of the dimensions, mass and power of a Mazda 3, EH Holden and its descendent model, the VF Commodore, is instructive.

	Length (mm)	Width (mm)	Weight (kg)	Power (kW)
Holden EH	4549	1727	1118	86
Mazda 3	4580	1755	1265	108
Holden VF	4894	1899	1622	185

These measurements show that a Mazda 3 is slightly longer, wider, heavier and more powerful than an EH Holden, an indication that current Australian preferences as to the most popular size of car remain much the same as they were fifty years ago. The latest Commodore, on the other hand, is much larger than its distant predecessor; compared to an EH Holden it is 345mm longer, 172mm wider, a massive 504 kg heavier and, even with the least powerful engine offered, has more than double the power output. This is more bulk, mass and power than mainstream Australian sedan buyers seem prepared to commit to and, as a result, they have moved their preferences away from the local large cars. As far as foreign principals are concerned, the evidence is clear; the steep decline in the number of units sold and the fact that the best selling models in Australia are now much the same as the best selling models in similar countries, has overturned the case for unique Australian designs.

Local managers have known for years that smaller cars were needed. The problem was that any attempt to produce Australian designs would be rebuffed. If, for example, local Ford managers admitted that the market needed a smaller Falcon, they would have been offered Mondeo. The same frankness at Holden would produce an offer of something from Opel, Daewoo or Chevrolet. From the viewpoint of the global parent corporation, this logic is hard to fault; without a compelling reason the company could not be expected to spend hundreds of millions of dollars to produce an Australian model like something it already had elsewhere.

The difficulty faced by local managers seeking approval for an Australian design suited to current market requirements is illustrated by the case of the Holden TT36 concept exhibited in 2004. Similar in size to an E46 BMW 3 series, the TT36, although much smaller, was similar in design to the current Commodore. If put into production, the TT36 would have given Holden an Australian-designed car more in keeping with current expectations of vehicle size. The TT36 was exhibited with a high output twin-turbo-charged 3.6 litre V6, hence the model acronym, although production models could have offered an alternative of smaller and more economical engines. This car would have sold well in Australia and been a contender for significant export sales. The BMW 3 series class is a large and popular global market segment and the TT36 played to the great strengths of the Australian industry; a flair for design and the ability to engineer a RWD chassis to German standards.

⁶ Cars of this size are still being produced, although they are now usually classed as A-segment or city cars; examples include the VW Up!, Mitsubishi Mirage and Nissan Micra. Placed above this size is the B-segment or supermini class which includes the VW Polo, Toyota Yaris and Ford Fiesta. The current definition of a C-segment or small family car is applied to models like the VW Golf, Ford Focus or Mazda 3.

General Motors chose not to proceed with the TT36 in Australia, opting instead to release the FWD Cruze, developed by its Korean subsidiary Daewoo in the sub-Commodore class. The failure to proceed with the TT36, a design conceptually and technically entirely superior to the Cruze, must have been a great disappointment to the Australian designers and engineers that conceived of it. General Motors did eventually release a similar compact RWD sports sedan to compete with the BMW 3 series; the American-built Cadillac ATS, winner of the North American Car of the Year award for 2013.

That General Motors would have chosen to address a significant global market for compact RWD sports sedans with a new small Cadillac rather than a Holden is, for a business with a global perspective, the most sensible course to follow. The reasoning is straightforward; Cadillac is the General Motors prestige brand, RWD is a technical architecture for prestige cars, therefore it should be applied in a Cadillac. This is the right choice for General Motors, but the wrong choice for the Australian industry. Holden has been denied the opportunity of developing a product and taking it into the global market in the one field of automotive design, the RWD sports sedan, where the Australian industry is as good as anyone else in the world.

As for the Cruze, it is difficult to see a way forward for an Australian motor industry that does not have the relentless technical improvement of local products to a point fully equal to the best international standards as the centrepiece of its strategy. Daewoo products form a significant part of the Holden range. As far as economy cars go, the Daewoo designs are worthy enough, but assembling parts brought in from a second-ranked Korean firm, in small numbers, in a high cost environment, does not provide a sound basis for a sustainable Australian automotive industry.

The conclusion to be drawn from the above is that the foreign ownership and control of the Australian industry has been an important factor contributing to its poor performance. It has narrowed the scope of local production, and hence the means of claiming significant market share, by the practice of filling out product ranges with models sourced from foreign sites. It has prevented the development of a fully independent marketing strategy for the exploitation of domestic and export opportunities in deference to an overarching corporate interest. It has distorted local product development decisions through principal-agent conflicts and it has frustrated the best attempts by Australian managers to develop the types of product and market opportunities that the local industry needs for its growth and natural development.

Ownership structure and the performance of national automotive industries

Nations that have been successful in automotive manufacturing have established and retained domestic ownership of firms while assisting them, through government policy, to secure home markets as a base for subsequent global expansion. The nations in this first group gained important economic benefits through the extensive technological linkages that flow from automotive manufacturing. The fact is that firms like Volkswagen, Toyota, Renault-Nissan, Fiat-Chrysler, Hyundai-Kia and even General Motors, are all artefacts of state policy. These firms have become some of the largest businesses in the world, and yet not one of them would exist today but for the determination of their respective national governments to make it so. Even if and when these firms shift a major part of their manufacturing out of their home countries, to Eastern Europe, Latin America or Asia, large flows of imperial tribute are still returned to their source in the form of financial dividends and high level technical knowledge and skills.

On the other hand, automotive manufacturing nations without domestically founded and held firms, where the industries are operated by branches of multi-national firms, derive fewer benefits and are in a much more precarious situation. Industries in these nations may, like Australia, have developed high level technical skills, but their exercise and security of tenure are always diminished by the absence of proprietary control. These industries have been set up for various reasons; to avoid tariff or quota protection, to exploit lower labour costs or to gain an advantageous location. For nations in this group, domestic firms have either not developed or have been acquired or put out of business by foreign firms. In such cases, governments may have taken a bystander position or mishandled automotive industry policy by failing to adopt a means of identifying and promoting local firms or, where they have formed, by failing to defend them against damage or acquisition by foreign competitors.

The easiest, but not the best, way for a nation to create an automotive industry is to invite one or more of the established multi-national firms to set it up. These firms have a profound knowledge of the business and the technology and, as a result, the introduction can be expected to proceed smoothly. This is the pathway that Australia followed into automotive mass production. There are some nations in the foreign owned industry group, like Belgium, Canada and Spain, that have achieved high per capita output performance, but although the industries in these nations may appear to be doing better than Australia, they are all heading in the same direction; losing volume as the global firms move on to lower cost locations. Over the last decade, Belgian output has fallen by a half, Canadian by a third, with another quarter at risk within the next few years, and Spain has lost a third of a million annual units. The trend is clear; global firms want to produce cars wherever the costs are lowest. Manufacturing is steadily moving out of these nations and, unlike those in the first group, given the absence of any industry equity or a technical or headquarters function, little or nothing is left of a once significant automotive industry after the sojourners have departed.

The Australian industry is in the second group. Australia has always been a high cost location and never an ideal base for exports. For foreign producers, the Australian market has been too large to ignore but not large enough to achieve economies of scale within the technical paradigms with which they are most familiar.⁷ The initial reason that American firms established themselves in Australia was to gain access to a significant market that required local body manufacture in order to avoid punitive tariff restrictions. As tariff and quota protection has now been dismantled, these firms are moving towards full importation, the default position that they have probably always preferred. This is a sensible decision for them, given the inhospitable cast of current industry policy, an overvalued Australian currency and their access to the lower cost design and production facilities they have available elsewhere.

Whether or not Australia should have an automotive industry is a question of little interest to the principals of global firms considering the future of distant outliers. These firms will, quite properly, look to their interests in a global context. Without large financial inducements, they

⁷ This point is not meant to concede that cars cannot be efficiently produced in Australia, only that the large global firms have their own ways of proceeding; evolved and adapted to suit what is, essentially, an imperial structure. These ways are not merely technical; they are designed, in part, to buttress and support an international division of labour and suppress separatist tendencies. There are other ways to design and build cars and there are emergent opportunities for innovation, particularly in finding ways of reducing required production volumes. Large global firms are not the natural place to progress such innovations, however.

will not support a continuation of Australian manufacturing operations. If Australia needs an automotive industry, that is an issue for national policy. It is not the duty of General Motors, Toyota or anyone else to provide Australia with an ideal industry structure; these firms have interests of their own to attend to. A national government adept at divining and acting upon its nation's strategic economic interests understands this and always monitors the behaviour and intentions of multi-national firms.

To have developed on a proper basis, the Australian automotive industry should have taken a different path. The structure put into place by American firms in the middle decades of the last century could not provide what Australia needed; an industry set up to become, in due course, a sovereign, highly developed, technically competent and enduring national asset. A necessary, if not sufficient, condition for the industry to have achieved its full potential was independence; to evolve, to choose its best course, to develop unique organisational and productive modes, to perfect a specific technical and product design culture, to differentiate itself from others, to build whatever models it needed, to expand into related business activities and to pursue international market opportunities wherever it wished. Many Australians working in the automotive industry throughout its long history have wanted to attempt these things, and may well have achieved them, but they worked for firms that were not set up for such purposes. Foreign ownership of the industry, and the contrary strategic imperatives this necessarily imposed, meant that such ambitions had to be resisted, not from malice, vindictiveness, or any doubts about the competence of Australians in general, but from the necessity of having to serve a different and overarching corporate interest.

Government policy and the development of national automotive industries

A feature of the historical development of national automotive industries is that the dominant manufacturing firms did not appear without the assistance of a concerted industrial policy. The need for some form of government intervention has been determined by a number of factors. These include the incomplete development, or relative backwardness, of a nation's technical resources, cost disadvantages beyond the ability of any individual firm to affect, a need to quickly gain economies of scale for competitive viability, the large initial investment needed to establish an industry and the fact that a number of model cycles must be worked through before a new entrant can hope to achieve a competitive international standard.⁸

Without sustained commitment from a national government, supported by effective policy and a willingness to use state power to hinder foreign firms seeking market access or local production sites, large automotive firms either do not emerge, or, if attempted, subsequently fail or lose their independence in the face of established foreign competition. The facts for new entrants to the industry are that the advantages possessed by established firms, their brand reputation, economies of scale and mastery of the challenging product and process technologies required, are sufficient to subdue latecomers in the absence of a strong form of national protection. Large scale automotive manufacturing is an example of a strategically important industry that requires favourable state policy for its establishment and continued existence. This has always been true, a fact that emerges from any historical study of automotive manufacturing. Perhaps it

⁸ The Korean automotive industry achieved the most rapid development to world-competitiveness, led by Hyundai-Kia. Originally a construction firm, Hyundai began producing cars in 1967 and had become globally competitive on quality, productivity and technology within forty years.

is a sense of this inconvenient fact that lies at the root of the animosity directed towards the Australian automotive industry by followers of the current economic orthodoxy; the realisation that the truth claim of their idea that the spontaneity of the market will always deliver better results than the consciousness of policy is decisively refuted by cases like this.

The motor car was invented in Germany⁹ but it was in America, at the start of the twentieth century, that the technical and organisational basis of high volume automotive manufacturing was laid down. Despite later national elaborations, most notably in Japan, the principal and enduring characteristics of the industry - the moving assembly line, the adoption of special-purpose machinery, the use of interchangeable parts, large metal stampings, various forms of vertical integration and sub-contracting, statistical quality control and small batch inventory management - were all first conceived of and applied in the United States.

As the first mover in mass production and the source of all important productivity innovations, the American automotive industry may appear to be an exception to the rule of the need for a supportive state policy, but this is not so. To begin with, the nascent American industry was protected from European imports by prohibitive tariffs, although these were not needed for very long. Protection for the rapidly developing American industry soon became superfluous because the arrival of the automotive age coincided with the emergence of the United States as the world's leading industrial and economic power; a pre-eminence that was largely founded on manufacturing practices that were different from and, in productivity terms, superior to those applied elsewhere.

These practices were not conjured up out of thin air by an invisible hand; rather they were managed into existence, often imperfectly and against entrenched opposition, and had taken many years to develop. America's decisive lead in productivity was the consequence of an inward-looking and utterly pragmatic nineteenth century nation building policy, the invention and diffusion of a new form of business organisation, the political ascendancy of Hamiltonian protectionism and, above all, by a novel manufacturing system, conceived of for defensive purposes in the post-revolutionary period and developed over many decades of costly trial and error, all initiated, perfected and paid for by the United States Department of War.¹⁰

At the dawn of the automotive era the stars aligned for the emergent American industry; a large and prosperous national market, a need for motorised transportation and an industrial system ideally configured to produce cars in large numbers at a low unit cost. American cars were designed to suit the wide range of geographic and climatic conditions encountered in the United

⁹ The first motor-car was the Benz Motorwagen of 1885. Self-propelled road vehicles are much older than this, dating from the late 1700s, but these were steam powered.

¹⁰ This was the Armory System, conceived of in France by Honore Blanc (inspired by the Gribeauval system of artillery standardisation) and brought to the United States by Thomas Jefferson, attempted by Eli Whitney after 1798 and perfected through the efforts of engineers like Colonel Roswell Lee, John S Hall and others, together with a supporting cast of New England machine builders, at the military arsenals at Springfield and Harpers Ferry. By the 1840s interchangeable part manufacture, or the "American System" as it had come to be known, was established in the armories, had stimulated a unique machine-building culture and machine-determined working arrangements which were, in turn, steadily diffused through the civilian economy. Other nations were slow to adopt the system for various reasons, but the American System was transformative – the second wave of the Industrial Revolution, in fact (the first being the application of chemical energy to shaft work in England) – and it drove American manufacturing supremacy well into the 20th century. The first Australian interchangeable part installation was the SMLE facility set up at Lithgow in 1915.

States and, as a result, could be sold almost anywhere. They were inexpensive, robust and reliable. Exported aggressively and successfully, they enabled the American firms to quickly establish a strong presence in foreign markets, to the general dismay of governments in other nations seeking to establish automotive industries of their own.

Outside of the United States opportunities for the development of the automotive industry were less favourable; national markets were smaller, incomes lower and manufacturing practices less well prepared for automotive mass production. As a result, the main thrust of automotive industry policy in Britain, Europe and Japan was to assist local firms and weaken the position of the Americans. The natural response of the American firms to this threat to their interests was to establish assembly plants in foreign markets in which they sought a presence and, where necessary, foster an appearance of local participation, even if often more apparent than real.

As other nations set out to develop domestic automotive industries, various policies were devised to counter the advantages enjoyed by American firms. In Britain a 33¹/₃% tariff was imposed on imported cars and a road tax formula was enacted, in part, to hinder the sales of American models. Protectionist measures enabled Britain to apply its considerable expertise to the development of a domestic motor vehicle industry. British entrepreneurs established a large number of firms, some of which reached mass production, although on a much smaller scale than practiced by the Americans. The British industry enjoyed considerable success, reaching a peak in the 1960s only to fade into steady decline in the face of superior foreign competition, poor management, trade union sabotage and government policy confusion.

The reasons for the decline of the British industry were many, but if a paramount cause had to be chosen it would be the failure of British governments to select and secure a domestic core firm to act as the centre of gravity for the industry. By temperament and competence, Herbert Austin should have been the beneficiary of such policy. The Austin Motor Company could have been Britain's national champion to set against the Americans, a need made manifest after Ford established its mini-Rouge at Dagenham and General Motors gained a British foothold through the acquisition of Vauxhall. Instead, successive British governments adopted an even-handed approach which, in practice, advantaged the Americans, Ford in particular, ahead of British firms, a policy which led to the loss of all of them in the end.

The failures of British policy were not repeated in Germany. During the 1920s the German motor industry followed much the same pattern as in other European countries, with a large number of small-scale producers building a handful of cars each year. The German national market for motor cars was relatively small at the time; in fact until the end of that decade it was about the same size as the Australian market.¹¹ The only German firm that had managed to achieve production in any sort of volume was Opel, and General Motors had acquired 76% of that company in 1929.

¹¹ At the end of 1929 there were about 26,500,000 motor vehicles in the USA, 1,370,000 in the UK, 1,260,000 in France, 1,170,000 in Canada, 609,000 in Germany and 570,000 in Australia (cited in Canberra Times, 2 April, 1930)

Ford in Germany was a small-scale assembly operation run as a subsidiary of the company's British business until 1931, when production began at Cologne.¹² Despite his (reciprocated) admiration for Henry Ford and for the American approach to production, Adolph Hitler wanted to diminish the influence of American firms in Europe.¹³ Hitler's National Socialist government grasped the strategic importance of the automotive industry and, as soon as the opportunity presented itself, set out to establish a large state backed national firm, Volkswagen, along American lines.

Under the guise of fostering industry standardisation, the German government co-opted Opel to assist with the Volkswagen project. Ford was invited to participate as well but demurred on technical grounds, citing the difficulty of accommodating its design practices with those of others. By the end of the 1930s Ford had been incorporated in Germany, had German directors, a significant local shareholding and a German name, Fordwerke. The company developed unique models, starting with the Eifel, and although seeking to grow its business and eager to stay on side with the German government, Ford was sent to the margins of the industry instead.

The post-war flourishing of the German automotive industry was founded on a maintenance of the essential tenets of the previous policy. Operating through a continuing network of financiers and industrialists, the main thrust of this policy was the support of a core firm group based on Volkswagen and other co-opted, but willing, German firms (BMW, Daimler Benz, MAN and Porsche) and the marginalisation of all the others. The group sent to the periphery of the German industry included the foreign-owned firms (Ford and Opel)¹⁴ but also banished were uncooperative or independent-minded firms, like Borgward.

Japanese pre-war policy was similar to that followed in Germany and, if anything, even more direct. Throughout the 1920s, despite government exhortations, the Japanese automotive industry scarcely existed. Ford and General Motors had established wholly owned assembly operations in Japan in 1925 and 1927 respectively and these firms quickly came to dominate the market, holding 90% of it between them by 1934. Under the influence of nationalist and militarist sentiments, Japanese government policy sought to set up local firms instead.

The main beneficiaries of this policy were Toyota, Nissan and Isuzu. These firms were propelled into a dominant position by a variety of means; prohibitive tariffs, import controls, currency restrictions, favourable tax treatment and relaxed investment rules for domestic producers. To make sure that the Americans were completely finished off, the Automotive Manufacturing Enterprise Law was enacted in 1936 and required the licensing and majority Japanese ownership of any firm producing more than 3000 vehicles per year. Efforts by the American

¹² The decision to build a German plant by Ford would have been in response to the GM acquisition of a controlling interest in Opel in 1929.

¹³ An idea expressed in Adolph Hitler's unpublished *Zweites Buch*, the sequel to *Mein Kampf*, was that, although the subjection of Europe to German policies and the acquisition of Polish, Ukrainian and Russian territory for *lebensraum* were the most immediate issues, it was the United States that posed the greatest long-term threat to German aspirations. Antipathy to the participation of American firms in the European economy can be ascribed to this belief.

¹⁴ A suggestion that old German industrial policy precepts remain influential is the apparent indifference shown by the Merkel government to the difficulties faced by Opel. Whether or not Opel stays in business appears to be of little concern to the German government. A threat to Volkswagen or Mercedes Benz would draw a very different response.

firms to seek mergers with Toyota and Nissan were rebuffed¹⁵ and by 1939 they had abandoned their position in Japan entirely, having fallen from a position of market dominance to exclusion in just five years.

Post-war industry reconstruction proceeded, after a brief liberal interlude, with similar policies and the same personnel. Their success is demonstrated by the fact that from the mid 1930s until the late 1950s, Toyota and Nissan accounted for 85% of Japanese automotive output.

In Italy the favoured firm was Fiat. To support local manufacture in the 1920s tariffs were applied up to a maximum rate of 142% and quotas restricted imports to just 3% of market share. These policies, introduced by Benito Mussolini's government, were backed by measures intended to drive all foreign manufacturers out of Italy and to prevent their merging with local firms. In this case, the French firm Citroen was the principal target. Ford was assembling on a very small scale at that time and an attempt to increase output by building a plant at Livorno in 1929 failed. General Motors made no headway in Italy. Autarchic policies outlasted Mussolini and survived well into the liberal post-war era; Ford's attempt to re-enter the Italian market in the 1960s, through the purchase of Lancia, also failed. Italian industry policy worked well; Fiat became one of the world's largest producers, with extensive global operations and a stable of brands, including Alfa Romeo, Lancia, Ferrari and Maserati as well as a controlling interest in the American firm Chrysler.

France was the birthplace of the automobile in its best form, le systeme Panhard, and, through the efforts of firms like De Dion-Bouton, Peugeot, and Citroen, was a steady source of clever technical innovation and an early adopter of mass production. Although not under authoritarian rule during the formative years of its automotive industry, the French policy outcome was similar to the National Socialist, Militarist and Fascist examples cited above.

France relied on tariffs, set in 1916 at rates between 70 and 220 percent, and regulatory obstruction to preclude the principal threat to the development of its industry, the American manufacturers. Ford did manage to get a plant into France before WW2, although General Motors did not. After the war Ford made an attempt to improve its position, with a new plant at Poissy, presumably under the impression that, as French liberty had been bought with American blood, the company might be made welcome. Not so; frustrated by government inertia, the company sold out to Simca in 1954. Chrysler managed to get hold of Simca, a private company, in 1963 but this was against the wishes of the French government and the firm faced Gaullist obstructionism throughout its tenure. The purpose of French policy was to ensure that local firms were always predominant. Post-war absorption and consolidation has seen the French industry devolve into a two-firm structure centred on PSA, an amalgamation of Peugeot and Citroen with remnants of a number of French manufactures, and Renault.¹⁶

The development of the Korean automotive industry was based on generally similar policies and practices to those relied upon in Europe and Japan. The industry is very young; it dates

¹⁵ Ford had earlier hoped to build up its Yokohama operation on similar lines to its project at Dagenham and use it as a production base for supplying all of Asia

¹⁶ The historical treatment to this point is a brief summary of the narrative presented in *The Fruits of Fascism – Postwar Prosperity in Historical Perspective* by Simon Reich of the University of Pittsburgh. The historical narrative on the Australian industry presented in the following section is based on the writer's own analysis and archival research.

from the mid 1960s and the industrialisation policies adopted by the government of President Park Chung Hee. The Korean industry benefited from the application of well-tried methods; close government and business collaboration, guaranteed bank loans, tariff protection and the physical restriction of imports, favourable joint ventures with foreign firms, technical cooperation agreements and the recruiting of foreign experts to key management positions.

The Asian financial crisis of 1997 was a major disruption to the industry and led to the collapse of some firms and their subsequent acquisition by foreign or domestic competitors. Daewoo was acquired by General Motors, Samsung Motors by Renault and Kia by Hyundai. The recovery of the Korean industry was achieved by reorienting the marketing focus from domestic towards export sales, a shift that required prodigious efforts to improve the quality perception of Korean cars in international markets. Having successfully achieved this in a remarkably short period, Hyundai/Kia has emerged as a major global producer.

The origins of the automotive industry in Australia

There were numerous attempts to establish automotive manufacturing firms in Australia during the first few decades of the twentieth century. Under different conditions one or more of these might have been the basis for the growth of a substantial local industry, but this was not to be.

Prior to the Great War, the Australian market for motor cars was very small and fragmented into tenuously connected regions. More than that, the absence of a suitable local source of low cost precision parts, a limitation not fully resolved until the 1930s, condemned all of the early ventures to failure. At the starting-out point of automotive manufacturing all of the mechanical parts required for driving and steering motor cars had to be processed from metal stock, castings and forgings on general purpose machine tools. These labour-intensive fitting and machining techniques demanded lengthy set ups and fastidious, time consuming, work by highly skilled craftsmen; a very expensive business. Given high Australian labour costs it is unlikely that even the most capable of the early automotive entrepreneurs, Harley Tarrant, who produced a number of very well made and technically advanced motor cars in Melbourne between 1900 and 1907 by using these methods, made any money from them.¹⁷

The early Australian manufacturers were not competitive; their workshop-built examples, however carefully built and well engineered they may have been, were too expensive to produce to be able to compete with the cars coming into the country, particularly from the United States. The best that these firms could manage was to make a small number of cars until financial realities compelled them to give up. Even serious attempts to establish the industry, like Frederick Gordon's Sydney-based Australian Six venture, were hampered by the fact that the main components, namely the engine, gearbox, rear axle, steering, brakes, suspension and electrical equipment, in the absence of any economic means of procuring a suitable local supply, all had to be imported.

¹⁷ Harley Tarrant, a mining engineer, established an engine manufacturing business in Melbourne in the late 1890s. Tarrant was an astute businessman and prescient engineer. He wrote extensively on automotive subjects, anticipating, and incorporating into his designs, the best design principles at a time when many remained confused. Only one complete Tarrant car, a 1905 four cylinder model, survives and is on display at the RACV headquarters in Melbourne. A Tarrant engine is also held in the collection of the Powerhouse museum in Sydney.

The early attempts by Australian manufacturers came too soon. Unlike in the United States, there was no sub-contractor enabled pathway¹⁸ to volume production available and Australian labour was too expensive to sustain European-style limited production by craft methods until such an opportunity eventually presented itself.

Although Australian industry, as it existed then, did not have the capability to profitably undertake the production of complete motor cars, the bodies that were fitted to them was another matter and the first policy intended to progress Australian automotive manufacturing was an attempt to exploit this opportunity. This took the form of an embargo placed on the importation of car bodies in 1917. Due to heavy losses inflicted on British merchant shipping by German submarines, governments in Empire countries actively discouraged all non-essential freight movements. Motor cars were considered luxury items in Australia, but rather than ban imports of them completely, a move opposed by the motor vehicle sales agents, the Commonwealth government restricted imports to motor car chassis instead.

This policy made sense at the time. The modern concept of chassis and body being formed as a single unit was still well in the future; standard construction practice, passed down from the carriage building trade, was body-on-frame and the production of motor chassis and the bodies that were placed on top of them was normally undertaken by different businesses. By eliminating the body from the cargo, a considerable volume saving was achieved and an opportunity was provided for local firms to increase the scope and scale of their activities. The policy had the effect of assisting the embryonic Australian automotive body-building industry by helping firms to move from carriage building, a well established but declining industry, into a closely related field. As a template for the future, the policy also identified a path that could be followed towards complete vehicle manufacture as and when further industrial capabilities were acquired in Australia.

Many firms took advantage of this policy but by far the most successful was an Adelaide-based company, Holden & Frost, originally established in about 1856 as a saddle and harness, and later, carriage fittings business. The company had dabbled in motor body building prior to the embargo and, with the prospect of a sizeable order from S A Cheney, the local Dodge distributor, seized the opportunity to greatly expand its business. By the early 1920s Holden's Motor Body Builders Ltd. (HMBB), as it had become known, was the largest of the Australian automotive body manufacturers and it supplied most importers, including Ford and General Motors. In 1924 HMBB opened a large modern plant at Woodville and entered into a contract with General Motors for the purchase of its entire output. This decision was one of the most significant in setting the course for the subsequent development of the Australian automotive industry.

Major American automotive firms had been quick to establish a presence in Australia and by the 1920s it had become one of their most important export markets. Their preferred policy was complete vehicle importation and they were, naturally enough, uncomfortable with the intent of

¹⁸ The great advantage enjoyed by American entrepreneurs, like Henry Ford, at start-up was the availability of repetition engineering businesses and precision part manufacturers able to produce standardised automotive mechanical components in small batches on a sub-contract basis. These firms provided the transition pathway from the craft workshop to mass production. No such firms existed in Australia during the first decade of the last century, the first appeared in the second decade but was dedicated to rifle production at Lithgow.

the body-building policy. At the time of the HMBB agreement with General Motors an executive from Ford of Canada, Hubert French, was travelling in Australia to evaluate the distribution arrangements for his company's products. French's report was highly critical of the way that Ford products were being handled in Australia; he objected to the size of the importer's margins, the distributor practice of offering multiple brands and of the poor quality of many of the local bodies being supplied. French had sought a supply agreement with HMBB himself but, having not moved quickly enough, found that his principal competitor had secured an exclusive right to all of the production of the best body manufacturing plant in Australia. This placed Ford at a disadvantage by requiring that it obtain bodies from second-best sources and, as a result, and although Ford initially preferred otherwise, the situation required that the company establish a local facility for car body production and assembly in Australia for itself. The site at first favoured for this plant was Launceston in Tasmania, but French eventually settled on Geelong, where construction started in 1925.

The most important change in the market for automotive bodies during the 1920s was the shift from open tourers to closed sedans. Closed bodies were much more complicated and expensive to produce than open bodies and for this reason their adoption in Australia lagged several years behind the United States.¹⁹ In America, the emergence of the new style had been accompanied by supplier tensions between General Motors and the Fisher Body Corporation, then the pre-eminent American body building firm. General Motors formed the view that Fisher Body was not dealing fairly with it on price and was concerned that technical knowledge obtaining to the construction of closed bodies, and considered essential to the prospects of their business, was not located within the company. General Motors resolved the contractual dispute, and gained control of an important manufacturing technology, by the acquisition of the Fisher Body Corporation in 1919.

Unlike the earlier relationship with Fisher, the contractual supply arrangements between General Motors and HMBB appeared to function smoothly, and even with real amity between the participants, until the late 1920s. Nevertheless, the history of the Fisher relationship, as well as the presence of a modern, large-capacity Ford plant at Geelong contributed to an adjustment of the General Motors position. Although HMBB had managed to acquire closed body production knowledge through its own efforts,²⁰ General Motors was reluctant to offer further technical assistance through Fisher Body because, with the exclusive supply contract for Woodville production having expired, such help would benefit the company's competitors. Ford, on the other hand, had complete control of body production at its own facility, a fact which would have disposed General Motors towards seeking a stronger position at HMBB.

¹⁹ A sectioned example of a Holden-built Chevrolet body is on display at the Powerhouse Museum in Sydney, object number H3457. This exhibit reveals the complex timber and steel composite construction of car bodies of the period.

²⁰ The first closed bodies produced by HMBB were Essex 2-door coaches for the light '6' model. Essex had led the development of low cost closed bodies in the US in the early 1920s. The HMBB bodies were built under the direction of Bert Wylie at the King William Street plant in 1924 (closed bodies were not produced at Woodville until July 1926). Wylie had worked for Duncan & Fraser in Adelaide before departing for America, at his own expense, to learn body building techniques. At first turned away, he subsequently managed to enter the United States through Canada and took a job as an assembly worker at Fisher Body, while paying for drafting lessons in his own time. Wylie became a foreman at Fisher prior to returning to Australia and joining HMBB. J.A. Holden, commenting on the early days of the Woodville plant, suggests that Wylie fulfilled a pivotal role in lifting HMBB from craft to production techniques. Source: Holden Archive, "*History Brief of J.A. Holden, 1951*", BRG213 89/26 (held in State Library of South Australia).

The output of HMBB peaked in 1927, when the company produced 46,981 units, and marked the high point of the company's fortunes. Although small by American standards (Fisher Body was about ten times the size), HMBB was probably the largest enterprise of its type outside of North America at that time. After 1927 it was downhill for HMBB; the Australian economy gradually fell into depression, through local factors in train before the Wall Street crash, and demand for car bodies collapsed. For HMBB the nadir was reached in August 1931 when just 26 car bodies were produced. For a large business like HMBB, employing over 3000 people at its peak, this was a disastrous position to be in and, facing serious financial difficulties, HMBB offered equity in its business to General Motors and was effectively taken over by that firm in 1931.

With this acquisition by General Motors the framework of the subsequent Australian industry was put into place; apart from a few desultory efforts, the era of local attempts to get into automotive manufacturing had come to an end. By 1939 General Motors Holden Ltd. (GMH), as it had become, was the largest firm, followed by the Ford Motor Company of Australia Ltd. In the next tier were other local body building and vehicle assembly firms. Another Adelaide-based business, T. J. Richards & Sons Ltd., mainly supplied bodies for Chrysler products and was acquired by that firm in 1947. Chrysler moved into complete vehicle manufacture in 1951 and passed the business on to Mitsubishi on leaving Australia in 1980. The last Australian-built Mitsubishi was produced in 2008. In Melbourne there was Ruskin Motor Bodies Ltd., a body building offshoot of Harley Tarrant's business. Acquired by the Austin Motor Company in 1949, which merged with Nuffield in 1954 to become the British Motor Corporation (Australia) Pty. Ltd. Production was moved to Sydney in 1958 and closed down in 1975, although Mini and Moke assembly continued at the Pressed Metal Corporation Ltd. at Enfield until 1982. The business that was eventually to become Toyota Motor Corporation Australia Ltd. started out as Eclipse Motors Pty. Ltd. in 1926 as the agent for English Standard cars, became Standard Motor Products Ltd. in 1951 and then Australian Motor Industries Pty. Ltd. in 1958 after concluding an agreement to assemble Mercedes Benz cars. The company also assembled Ferguson tractors and American Ramblers. It added the Toyota Tiara to the list in 1963 and was finally acquired by the Japanese company in 1987. There were a number of other firms that produced in Australia for a time. The British Rootes Group assembled Hillman, Humber and Singer cars through an Australian subsidiary in Melbourne from 1946 until the company merged with Chrysler in 1965. Between 1954 and 1976 Volkswagen assembled over 250,000 cars in Australia, with local content approaching 95% by 1967. Renault assembled cars at Heidelberg between 1966 and 1981.

The pre-war facts for the Australian industry were that by the time the domestic market was large enough to support the local manufacture of motor cars, and the skills and capabilities needed were in place, the major American firms had taken a commanding position. Local automotive entrepreneurs lacked the technical and financial resources to ease the American firms aside. Only a national government could manage that, which was what was happening in Europe and Japan during the 1930s. There was an opportunity for Australia to follow a similar path when, at the end of 1939, the first Menzies government passed into legislation the Motor Vehicle Engine Bounty Act to establish a large-scale engine manufacturing plant in Australia. An agreement was reached with Australian Consolidated Industries Ltd. but the timing was hardly ideal. Manufacturing industry was then being redirected towards wartime production, political opponents worked against the proposal and the government changed. When the matter of complete manufacture of motor cars in Australia was again considered, in 1944, the Curtin

Labor government abandoned the engine bounty in favour of a different proposal. The American automotive firms had provided support to Australia's war effort and out of demonstrated competence and the personal standing of Laurence Hartnett, GMH was given the post-war task of advancing the local industry to complete motor vehicle production.

Post-war developments; establishment, growth and decline

The project to launch the Holden car was expertly handled, as could be expected, given that General Motors was perhaps the world's best managed company in 1948. The post-war Australian industry started smoothly, expanded steadily, flourished for a quarter of a century and then, without a dynamic national firm and the strategic policy framework needed for it to thrive, fell into stasis and decline. Had a national core firm been established on European, Japanese or Korean lines and supported by determined industrial policy, Australia would have had a chance to develop a much better industry than it has. Whatever initial risks might have been attached to founding such a firm, without it there was no prospect of a successful long-term outcome at all.

Despite the defective base on which it was founded, the industry grew during the post-war years through a mix of local content plans, tariffs and quotas, which delivered most of the market to Australian-based foreign manufacturers and local assemblers. In the absence of any determined policy to raise productivity and rationalise the structure of the industry, these assistance measures encouraged the proliferation of small-scale and inefficient firms with sites scattered around the country. The small domestic market was overly divided and, although attempts were made to exploit regional export opportunities with some success, the arrival of better value Japanese products brought a swift end to the sale of Australian cars into Asia.

Without a policy to rationalise the industry, new manufacturing firms were still being invited to set up in Australia as late as the 1970s. The principal characteristic of the industry in this period was that it had too many firms and too many assembly plants, all propped up by government policies that lacked any mechanism to ensure that the industry was constituted on a strategically and technically sound basis.

Pressure for industry rationalisation increased as the movement for trade liberalisation gathered momentum. Reform was initiated by tariff cuts, eased into place by industry adjustment assistance packages. In the case of the automotive manufacturing sector, this was implemented through the Motor Industry Development Plan with John Button, the industry minister in the Hawke government responsible for negotiating its introduction. The objective of the plan was to improve industry productivity by acquiring better economies of scale, to be achieved by reducing the number of model offerings through inter-company product sharing arrangements.

The limitation of the Button plan, and the eventual cause of its failure, was the superficial nature of the product exchanges. These took the form of 'badge engineering'; the practice of offering almost identical vehicles with different names. Thus Holden Commodores were branded as Toyota Lexcens, Toyota Camrys as Holden Apollos, Nissan Pulsars as Holden Astras and Nissan Pintaras as Ford Corsairs. Badge engineering was unpopular with customers and companies

alike. A lack of support and enthusiasm from buyers and sellers led to the sales failure of the product exchanges mandated under the Button plan.

To be effective in achieving its model rationalisation objective, without destroying industry volume, the Button plan needed to impose model sharing at a more fundamental technical level. This could have been achieved by insisting on platform or power train sharing between firms. Such a requirement would have provided a way of amortising the cost of the most expensive to engineer and produce vehicle elements over a range of models.

An example of successful platform sharing, although not within the scope of the Button Plan, was the Australian-styled Ford KC Laser. This was a re-bodied version of the Mazda 323, a fact of which very few customers of either model would have been aware. Platform sharing in this instance was facilitated because Ford had an equity stake in Mazda at the time. Platform sharing is very common within firms, for example between Volkswagen, Audi, Skoda and Seat or between Nissan, Samsung and Renault. It is less common between firms, although it does occur.

In the case of Australian manufacturers operating within the Button plan, platform sharing was not feasible because it would have required companies that were minor parts of large global businesses, with access to a full range of their own models, to forego natural corporate linkages in favour of working with commercial rivals.

The Button plan ultimately failed in its purpose when the Australian manufacturers, taking advantage of falling tariffs, and with the excuse of poor sales of the badge-engineered models, filled out their product ranges with vehicle imports from other parts of their respective global businesses.

The Button plan left the Australian industry marooned with an overly narrowed product base, vulnerable to collapse as customer sentiments shifted elsewhere. Subsequent policy has, in essence, consisted of handing public funds to foreign-owned firms (which, with the possible exception of Toyota, have no desire to stay in Australia), in order to postpone the closure of the industry beyond a current electoral cycle.

Saving the Australian automotive industry

Opposition to a continuation of public funding for Australian automotive manufacturing comes from a number of quarters. The most strident contrarians are advocates of the neo-Ricardian proposition that Australia should stick to what it does best – and that, they would maintain, is not manufacturing. Most academic economists take this view and are supported by acolytes in the media, much of the bureaucracy and business interests operating in activities, like mining and some agriculture, that can be internationally competitive without assistance.

Despite the breadth of this opposition there are good arguments for retaining, sustaining and, over time, considerably enlarging the Australian automotive industry. For one thing, a domestic market of more than a million cars per annum represents a significant portion of GDP. To shift that market, in its entirety, into imports will displace labour and capital from a useful and technically challenging set of employments that will not be readily taken up. It will place even greater pressure on Australia's already weak balance of payments position, currently in deficit

by about forty billion dollars per annum. The relative shrinkage of domestic automotive production over the last three decades would account for about one third of this deficit.

It is important to sell Australian-built cars and it is even more important to maintain and advance the capabilities that enable the production of them. Automotive manufacturing engages an encyclopaedic range of productive activities. There is hardly an important manufacturing process that is not applied somewhere in the production of motor cars. Not only is a wide range of material processing activities practised, these are performed at the most demanding level. A distinguishing mark of automotive manufacturing is that it manages the production of complex engineered structures and sophisticated mechanical systems, in large numbers, with exceptional reliability, precision and uniformity, at a low unit cost. These are essential capabilities for an advanced nation to have and an important marker of its level of achievement as a technical civilisation. A national government that would stand by and allow such rare and sought-after capabilities to be dismantled would be foolish indeed.

A criticism levelled at Australian automotive manufacturing is that it is an industry that belongs in the past. This is incorrect. Automotive manufacturing, in some evolving form, will continue into an indefinite future. There are many automotive manufacturing companies operating today, already into their second century, that could still be in business, fortune and policy permitting, hundreds of years from now. It is worth bearing in mind that the previous road transportation technology, the horse-drawn wheeled vehicle, first appeared in ancient Mesopotamia and survived into the early decades of the last century.

What can be done to save the industry? A first step would be to cut the Gordian Knot of foreign ownership and control of at least a part of the industry. The Australian automotive industry can best be recovered when local managers are in charge of a significant part of it.

Government should not be assisting companies that will only stay in Australia on terms that are not aligned with the nation's strategic interests. Previous assistance to the industry has not placed it on a sound basis because the required decisions have been beyond local control. Some form of Australian equity and management control should be a condition of further support. The easiest way to achieve this would be to have an Australian firm put into a position to acquire all or most of the assets of one or other of the American manufacturers operating here.

With the help of a supportive industry policy focused on performance, an Australian owned and managed core firm can ensure the continuation and growth of automotive manufacturing into the indefinite future.

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