LUXURY VEHICLE PRICE CHANGES

Study undertaken for
Federal Chamber of Automotive Industries
by
AUSTRALIAN AUTOMOTIVE INTELLIGENCE

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Executive summary

Aim of study

The purpose of this study was to measure whether the car depreciation limit (CDL) - and therefore the luxury tax threshold (LTT) which is based on the CDL - has been adjusted sufficiently since inception:

- to reflect the movement in luxury vehicle prices specifically and
- to reflect the movement in vehicle prices more generally.

Depreciation limit/luxury tax threshold adjustments

CDL/LTT adjustments occur on 1 July each year - providing there has been an increase in the Consumer Price Index Motor Vehicle Index (CPIMV) in the year ended in the preceding March quarter.

The CPIMV rose in only 3 years between 1996 and 2008, resulting in a significant rise in the CDL/LTT in 2002 and very small increases in 2007 and 2008.

Quality adjustment

The methodology used for incorporating new vehicle prices into the CPIMV has effectively reduced the price change because of the adjustment of prices for "quality" improvement in vehicles - quality in these terms can be broadly seen as changes in specifications. Over the long history of rising vehicle specifications, the CPIMV therefore does not fully reflect the increase in prices actually paid for cars.

Alternative price measures

Using alternative available indexes of vehicle prices, the study shows that both the CPIMV and the adjustment of the CDL/LTT have fallen significantly short of the movement in these alternative indexes over comparable time periods. The adjustment has also fallen significantly short of the movement in Average Weekly Earnings (AWE) and more general measures of price movements.

Luxury vehicle price index

The major work for this study involved constructing a Luxury Vehicle Price Index (LVI) to compare the movement in the CDL/LTT with the movement in luxury vehicle prices. Luxury vehicle prices were adjusted downwards for the luxury tax on motor vehicles, so as to remove the impact of these decisions on the price of luxury cars. It therefore shows the movement in the underlying price of luxury vehicles on the same tax basis as for vehicles included in the other indexes.

LVI risen more than CDL/LTT

The LVI shows that this underlying movement in luxury vehicle prices has also significantly outpaced the rise in the CPIMV and consequently the adjustment to the CDL/LTT.

The LVI rose considerably more rapidly than the CPIMV both:

- over the full period since the CDL was introduced
- between 1996 and 2008 when the LVI rose in all except 2 years - almost the reverse of the CPIMV figures over this period which only rose in 3 years.

Where should CDL/LTT be?

All the work undertaken for this study indicated that the use of the CPIMV has resulted in under adjustment of the CDL/LTT. There can be no absolutely "correct" measure of prices, but if the CDL/LTT had been adjusted since 1979 by:

- the LVI , then the CDL/LTT would be 23 percent higher, or about $70,400, compared with $57,180 now
- the F6I (Commodore and Falcon), then the CDL/LTT would be 54 percent higher at about $88,000
- AWE, then it would be about $95,500.

Rising proportion of luxury vehicles

The result is that the number of new light vehicles excluding light trucks - that is cars, station wagons and SUVs sold in Australia - that are subject to the application of the CDL and/or the luxury tax has risen from about 2.5 percent of such sales in 1979 to around 11 percent in 2007.

Analysis of this data points to a migration of vehicles above the CDL/LTT, especially by vehicles which are now broadly in the $60,000 to $80,000 range.

Expanded beyond intent

When the Treasurer, Hon. John Howard, introduced the CDL in the 1979-80 Budget, he noted that the target was *expensive* luxury cars. However many cars and SUVs - including an increasing number of Australian made cars – are now being trapped above the CDL/LTT. As indicated above we estimate that the proportion of passenger vehicles covered has risen from about 2.5 percent of sales in 1979 to around 11 percent in 2007

Need to change

The effect of the lagging adjustment of the CDL/LTT compared with the typical movements in vehicle prices has been to substantially lower the level at which vehicles are trapped by the CDL/LTT. There is a clear need to either:

- abolish the luxury tax
- or substantially increase the CDL/LTT to reflect the actual movements in vehicle prices.

With either option it would be necessary to introduce a new standard for adjusting the CDL/LTT in future.

Luxury vehicle price changes

1. Purpose

The purpose of this study was to measure whether the Car Depreciation Limit (CDL), which subsequently became the basis for the Luxury Tax Threshold (LTT), has been adjusted sufficiently since inception to reflect the movement in:

- luxury vehicle prices specifically
- and more generally vehicle prices.

The principal element of the study is the construction of a price index of luxury vehicles sold in Australia, in order to enable examination of the relationship in the movement of prices of luxury motor vehicles in Australia and the indexation of the CDL/LTT.

This construction of a luxury vehicle price index has been supplemented by the use of other available measures of vehicle price movements and some broader measures of inflation.

2. Background

2.1 Car Depreciation Limit

The Car Depreciation Limit (CDL) was introduced from the 1979-80 income year, placing a cap on the value of a car that could be used for calculation of depreciation for taxation purposes. That limit is currently $57,180, having risen from an initial value of $18,000 in 1979-80.

The limit is indexed in line with the Consumer Price Index Motor Vehicle Index (CPIMV) movements. An annual adjustment is made on the basis of:

- the increase in the CPIMV between the years ended in the March quarter of each year, with any increase being applied to the CDL at 1 July if there has been an increase in the CPIMV
- the CDL is not adjusted downwards for any decrease in the CPIMV
- each calculation of annual increase is undertaken as a discrete annual calculation - there is no cumulative calculation.

2.2 Luxury Tax Threshold

The luxury tax was introduced in the 1986 Federal Budget and:

- raised the Wholesale Sales Tax (WST) on luxury vehicles from the general WST rate of 20 percent to 30 percent
- the CDL also became the basis for defining a luxury vehicle, and is known as the luxury tax threshold (LTT).

There were subsequent changes to the WST on luxury vehicles, including:

- a short lived increase in the luxury tax WST rate to 50 percent
- a change from the luxury WST rate applying to the total value of a luxury vehicle, to the luxury rate applying to the value of the vehicle above the LTT
- with the introduction of GST, the luxury tax on vehicles continued in an amended form, despite the abolition of all the other discriminatory WST rates at the introduction of GST.

2.3 Multiple Taxation

The various taxation imposts on vehicles generally, and specifically luxury vehicles, result in a high tax incidence on luxury vehicles. These consist of:

- the inability to depreciate vehicles for taxation purposes above the CDL
- the luxury sales tax/luxury car tax which has applied to luxury vehicles and more recently just to the element which is above the LTT, but which is also excluded from depreciation by the CDL
- the LCT is not a GST input credit for business purposes
- fringe benefits tax (FBT) on the whole luxury vehicle, including the value which is not eligible for depreciation and on which the luxury tax falls
- state stamp duties which range between 2 percent and 5 percent on the value of the vehicle and in some states are at the high end of the range for more expensive vehicles.

3. Outline of Luxury Vehicle Index methodology

3.1 Steps

More detail on aspects of the methodology of constructing the Luxury Vehicle Price Index (LVI) is included in Attachment 1, but the essential steps were:

- collection of annual sales and prices of new luxury vehicles sold in Australia from 1978 through to 2007
- adjustment of recommended retail prices (RRP) of vehicles to remove the effect of the addition of the luxury WST/GST, yielding prices for luxury vehicles as they would have been had only the general rate WST/GST for vehicles applied
- calculation of a Paasche price index for luxury vehicles using the adjusted price and sales data and incorporating models which sold in significant volumes
- comparison of the LVI with other indexes, including:
  - an index constructed from the CDL/LTT
  - the CPIMV
  - the Automotive Industry Authority/Australian Automotive Intelligence Report (AIA/AAIR) car price index
  - an index of the average price of the base models Ford Falcon and Holden Commodore, called Family 6 Index (F6I)
  - the CPI All Groups (CPIAG) and the GDP Implicit Deflator (GDPID)
  - an index of Average Weekly Earnings (AWE).

3.2 Removal of luxury tax

The second step outlined above - the removal of the additional amount that the luxury WST/GST adds to the price of a vehicle over the amount that would apply if the non luxury rate applied to a vehicle - is important because:

- the luxury tax is an exogenous policy decision of government and is not related to the normal movement in prices
- the removal of the luxury tax element enables measurement of the business driven movements in luxury vehicle prices relative to non luxury vehicle prices
- with the luxury tax removed, we can gauge whether the adjustment of the CDL/LTT has been in line with the market driven element of luxury vehicle prices.

3.3 Timing

There are slight differences in timing of the indexes which are used in this study.

The CPIMV used for adjustment of the CDL/LTT is that calculated for the year ended in the March quarter of each year - in recent years the CPIMV has been based upon collection of data in each month of the quarter, but it is understood that in earlier years the data was only collected in the mid month of the quarter - in the case of the March quarter, in February.

The CDL/LTT is therefore based on the movements in prices to the year ended in the March quarter, although any change in the CDL/LTT does not occur until the following 1 July.

Other indexees based on the year ended in the March quarter are the CPIAG, GDPID and AWE.

The AIA/AAIR index is calculated based on prices at the end of each quarter commencing in December 1982 and the index figures used in this study are those at the end of December in each year.

The AIA/AAIR index has been linked back to the December quarter 1978 using the relationship to the CPIMV in the first 5 years of the former AIA index.

Because of data availability it was also decided to calculate the Luxury Vehicle Index based on prices at the end of December of each year. This timing:

- corresponds with the December quarter data of the AIA/AAIR index
- is a quarter later than the mid point of the year ended in the March quarter of the CPIMV.

The Family 6 index has also been calculated at the end of December.

As already noted the December index figures are shown in the charts and table in the following years, to reflect the year that they would impact on the CDL/LCT if used for adjustment.

4. Indexes used

Indexes used in this study have already been listed. Before proceeding to compare the results, some general points are made about the indexes.

4.1 Consumer Price Index

The Consumer Price Index is calculated quarterly by the Australian Bureau of Statistics (ABS). The current index is the 15th Series used since the CPI began in 1960 - the succeeding series are linked to provide a comparison over time. For confidentiality reasons the amount of information available about the CPI and its construction is limited and usually general in nature - the following points about the CPI should be read in this context.

Construction of the CPI

From the perspective of comparing the indexes used in this study, some key features of the CPI are:

- it is a Laspeyres index - that is the weighting of the index is based on a preceding period
- typically the weighting of the CPI is revised about every five years, to bring the weighting up to date with changing consumer spending patterns; minor revisions to the weighting can occur between series to cater for significant sudden changes affecting an element of consumer spending - for instance the introduction of Medibank (now Medicare) in the 1970s.

The above points are relevant to the construction of the CPI as a whole, but there are some aspects of the CPI Motor Vehicle Index which are of particular relevance to this study. They are:

- the ABS surveys dealers and other parties to determine the prices paid for new vehicles rather than relying on price lists and RRP - changes in the index can therefore reflect changes in the extent of discounting prevalent in the market
- the CPI weighting is based on consumer spending - the weighting of the CPIMV will therefore resemble private vehicle sales rather than total sales (which include business and government purchases)
- the most important aspect of the CPIMV from the perspective of this study is what the ABS terms “adjusting for quality”.

Quality adjustment

Adjustment for quality is made to the vehicle prices used for the CPI - “... whenever any specification change is made to a vehicle that affects its motoring performance, economy, comfort level, safety or durability ... an adjustment is made to the car’s reported price to allow for that portion of the price change that can be attributed to the quality change.” [ABS 6461.0, 2003, para 8.101]

Changes which would have triggered a quality adjustment include replacement of carburetors with EFI or drum brakes with disc, addition of CD players and inclusion of AC as standard.

The net result is that prices included in the CPIMV - in an environment where the “quality” of cars is almost continually improving - will typically be lower than the prices paid by consumers for cars. The increases in the CPIMV will therefore be less than the increases in prices paid by buyers for cars.

This is not necessarily a criticism of the CPI, but it is:

- an important difference between the CPIMV and the other indexes used here
- a difference which is particularly relevant to the use of the CPIMV as the benchmark for adjustment of the CDL/LTT.

4.2 AIA/AAIR Index and Luxury Vehicle Index

The AIA/AAIR Index and the Luxury Vehicle Index share most features. The key ones are:

- they are both based upon the RRP of the vehicles included
- the selection of vehicles is based on the level of sales - the indexes aim to include all vehicles which sell in significant volume (in passenger and SUV sectors as appropriate)
- they are both Paasche indexes - that is the weighting is based on the period for which prices are being measured, and change with each period
- there is no explicit "quality adjustment" - however there is a degree of implicit adjustment for quality changes which occur at major or full model changes, as movements in prices of a model at such changes are not included in the index calculation.

There are some differences between the two indexes, a number of which are to do with more detailed methodology and are summarised in Attachment 1. The broader differences between the two indexes are:

- the AAI/AAIR Index is calculated quarterly based on RRP at the end of each quarter, but the Luxury Vehicle Index has been calculated annually, as at the end of December in each year
- the AAI/AAIR Index covers non luxury PMVs, whereas the Luxury Vehicle Index covers luxury PMVs and luxury SUVs
- the AAI/AAIR Index is of actual RRP, whereas the Luxury Vehicle Index is of prices which have been adjusted (down) to remove the added element of price which the luxury tax imposes above that applying to non luxury vehicles.

4.3 Family 6 Index

The Family 6 Index is the simplest of the indexes as it is based on the average RRP of the lowest priced 6 cylinder sedans with automatic transmission from the Holden Commodore and Ford Falcon ranges. It is therefore an index:

- based on RRP
- with no "quality adjustment", either explicit or implicit
- that can either be viewed as "unweighted" or "equally weighted" and this does not change throughout the period regardless of relative sales of the two models.

4.4 Comparison of key aspects

Type of index
Different types of indexes will almost inevitably give differing results, even when the data used is identical. Often the type of index used will be dictated by the nature of the available data. The differences in results between the types of indexes are difficult to assess for a variety of reasons, however it is likely that differences between the CPIMV results and those of the other indexes have much more to do with other aspects of the respective indexes, than the types of indexes used.

Weighting
Regimen and weighting of indexes are closely related and there are two aspects of particular relevance:

- the different indexes each seek to measure different clusters of vehicles - the CPIMV is focussed on vehicles that households buy and is weighted accordingly; the other indexes cover selected types of vehicles, but the weighting is based on total sales of the models included
- the CPIMV is typically base weighted, with the weighting updated about every five years. The AAI/AAIR and LV Indexes are weighted on sales in the current quarter or year. In an era of typically rising prices, including varying increases between different models, changing affordability will normally result in buyers moving towards models that increase less in price and away from those that have risen more in price. The AAI/AAIR and LV Indexes - because their weighting changes with sales - will therefore tend to result in lower index increases than would an index weighted in the same way as the CPIMV.

Once again any differences of outcomes between the indexes arising from the weighting are probably relatively minor, but the overall impact will tend to be to reduce the difference between the CPIMV and the other indexes.

In order to test the degree to which the weighting method might affect the index outcomes, in the original 2005 study a Laspeyres index was calculated for luxury vehicles (LVLas), with the weighting updated each year using the data collated for the LVI. The essential difference between the Luxury Vehicle Price Indexes is that:

- the LVI (Paasche) index is weighted by sales for the current year
- the LVLas (Laspeyres) index is weighted by sales for the preceding year.

As expected, the LVLas showed a slightly higher increase over the period from 1978 to 2003 than did the LVI - a difference of 2.6 percent over the full period. For shorter periods calculated, there was little difference between the two indexes and this analysis was not repeated for this update.

Because the CPIMV weighting has typically been adjusted about every five years, the difference between an index weighted in a similar way and the LVI is likely to be a little greater. Even so, the outcome of experimenting with the LVLas suggests that:

- there is unlikely to be a major difference between the CPIMV and the LVI because of the method of weighting
- if anything, because vehicle prices have typically been rising, the LVI weighting method will slightly understate price increases relative to the CPIMV weighting methodology.

Choosing prices

The CPIMV is based upon data gathered about actual selling prices whereas the other indexes are based on RRP. Leaving aside questions about the accuracy of the data gathered by the ABS, the view of the Automotive Industry Authority and subsequently Australian Automotive Intelligence in the calculation of the AAI/AAIR Index has been that:

- the degree of discounting fluctuates over time, rising and falling with the multitude of factors that affect the vehicle industry and market
- the fluctuation in discounting will result in RRP based indexes either under or over estimating actual price changes for any period, but this is likely to be cyclical
- over periods of more than a few years, changes in RRP reflect the changes in actual selling prices.

Quality

Over the longer term, the predominant differences in outcomes between the CPIMV and the other indexes will arise from the quality adjustment of the CPIMV.

5. The comparisons

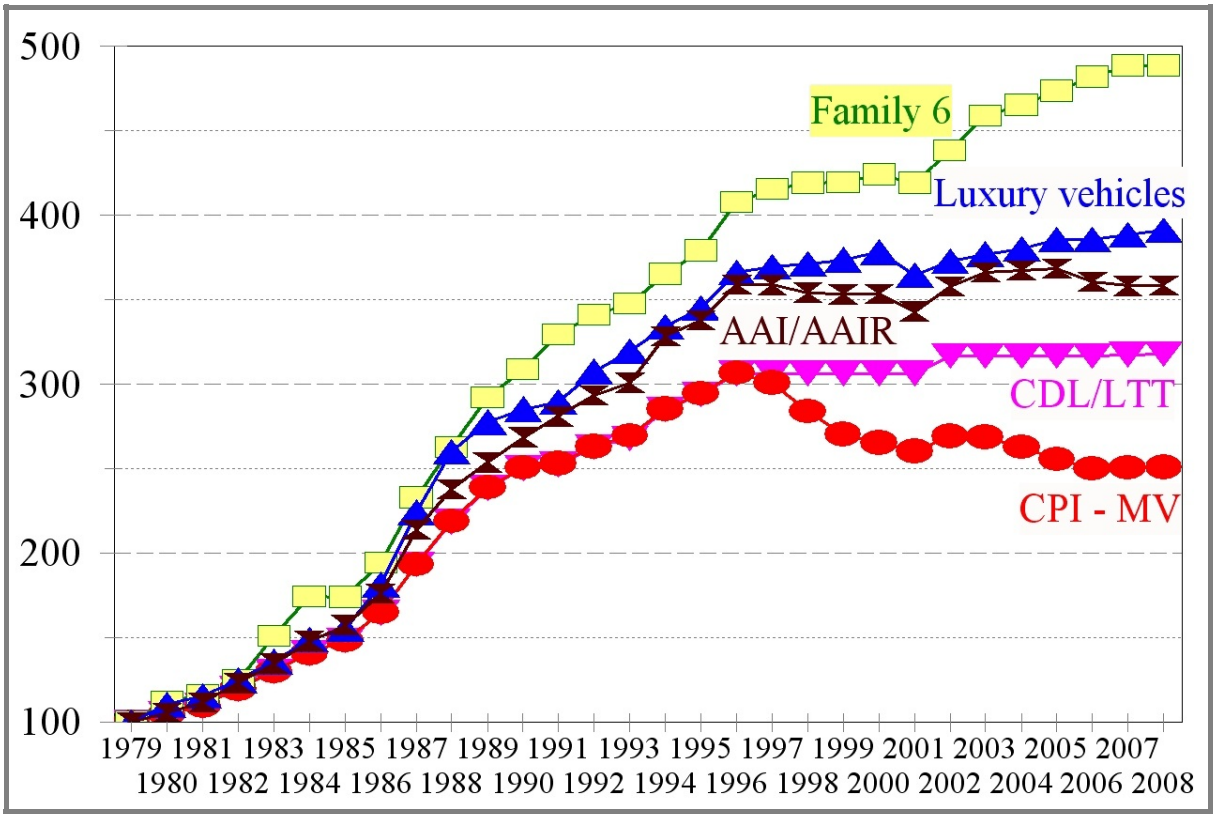
This section compares the calculated LVI with other price index data from 1979 to 2008.

5.1 Vehicle price indexes

This first chart compares the CPIMV, an index of the CDL/LTT, the Luxury Vehicle Index, the AIA/AAIR index and the Family 6 Index from 1979.

VEHICLE PRICE INDEXES

Index values are shown for the year in which the value would cause a change in the CDL/LTT if used for adjustment of the CDL/LTT; 1979 = 100



The chart shows that the CPIMV and the CDL/LTT moved in line up to 1996 - reflecting the fact that the CDL/LTT is adjusted for increases in the CPIMV, the latter rising in every year to 1996.

However since 1996 the CPIMV has fallen in most years - as a result 2002 is the only year with a significant increase for the CDL/LTT, but there was a minor rise in 2007 and an even smaller increase in 2008.

Two of the other indexes - the F6I and LVI - have:

- risen every year except 2001, following the introduction of GST in 2000 which significantly reduced vehicle prices
- risen much more over the period from 1978 to 2008 than either the CPIMV or the CDL/LTT.

The AIA/AAIR index has fallen on 5 occasions since 1996:

- most notably in 2001 and 2006, following the introduction of GST in 2000 and the 5 percent PMV tariff reduction in 2005 respectively
- despite the mixture of small rises and falls over the last decade , the relative stability of the AIA/AAIR index contrasts with the substantial decline in the CPIMV.

It should be noted that the LVI is an index of the prices of luxury vehicles adjusted (down) for the luxury vehicle tax, so that:

- it represents price changes that occurred less those caused by the introduction of the luxury tax and subsequent changes to that tax
- it is therefore on the same tax basis as the other indexes
- an index of the actual (unadjusted) RRP including the luxury tax would be substantially higher.

As already indicated the major differences in outcomes between the various indexes, except for relatively short term cycles, arise from the quality adjustment of the CPIMV, with the result that the CDL/LTT significantly lags the other vehicle price indexes.

If the CDL/LTT had been adjusted by the:

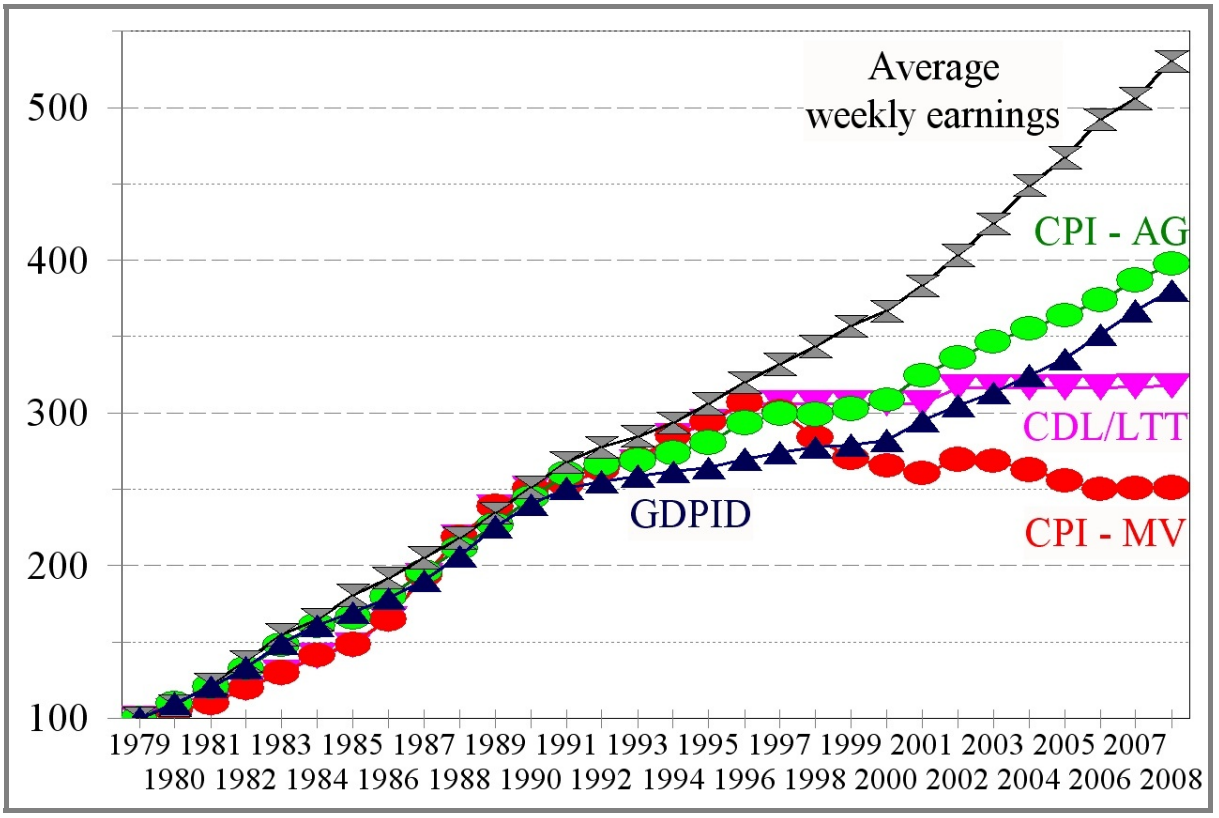
- AIA/AAIR then it would be about $64,500 in 2008, compared with the current $57,180
- LVI since 1979, then the CDL/LTT would be 23 percent higher, or about $70,400
- F6I since 1979, then the CDL/LTT would be 54 percent higher at about $88,000.

5.2 Comparison with broader price indexes

The next chart is similar to the preceding chart except that it compares broader measures of inflation with the CDL/LTT and CPIMV indexes.

PRICE INDEX COMPARISONS

Index values are shown for the year in which the value would cause a change in the CDL/LTT if used for adjustment of the CDL/LTT; 1979 = 100



This chart shows that all of the broader measures of inflation have increased substantially more than the CDL/LTT, with the AWE (a common measure of changes in incomes) having increased at almost double the rate of the CDL/LTT - if the CDL/LTT had been indexed by AWE then it would be about $95,500 from 1 July 2008.

6. Rising incidence

There are some indicators of significant migration of vehicles from below to above the CDL/LTT over time, including the following:

- in 1979 there were only two SUV models with variants above the CDL - the Jeep Cherokee and the Range Rover - in total less than 1,000 vehicles; 21 SUV models are included in the Luxury Vehicles Index for 2008
- in 1979 there were only two Australian made models which exceeded the CDL at the end of the year - the Holden Statesman Caprice and the Ford LTD - with sales of 2,615 units or 23 percent of the combined Ford Fairlane/LTD and Holden Caprice/Statesman sales for the year; by the end of 2007, sales of luxury variants of the locally made models were about 11,000 units
- other Australian made variants that had moved above the CDL/LTT by end 2007 were
  - Ford FPV sedans and the Territory Ghia Turbo SUV
  - Holden Calais V8, HSV Clubsport, GTS, Grange and Senator sedans
  - some other now discontinued models, including Ford Fairlane and Holden Monaro variants
- over time sales of luxury variants of some key prestige luxury models have grown much more strongly than those of the variants below the CDL/LTT, especially BMW 3 Series, Mercedes-Benz C Class and Lexus IS.

While lack of detailed data, especially for early years, plus complexity have precluded calculation of exact data, we have made broad estimates of the number and proportion of vehicles that were above the CDL in 1979, 2003 and 2007 respectively based on available data and informed judgements.

There are 12 models included in the LVI for 1979, while for 2007 there are 46 models, with 4 other models excluded because of model changes during the 2007 year. This suggests more than a quadrupling of the number of models subject to the CDL/LTT over that time.

Our estimates of the number and proportion of vehicles subject to the CDL/LTT in 1979, 2003 and 2007 are shown in the table below.

Estimated number and proportion of PMVs and SUVs above CDL/LTT

Calendar years; units except for % of total above the CDL

Year	PMVs			SUVs			Total PMV and SUV		
	>CDL	Total	% >CDL	>CDL	Total	% >CDL	>CDL	Total	% >CDL
1979	11,000	445,225	2.5	1,000	6,000	16.5	12,000	451,000	2.5
2003	37,500	588,511	6.5	32,500	173,087	18.5	70,000	761,598	9.0
2007	52,000	637,019	8.0	38,000	198,176	19.0	90,000	835,195	11.0

The data in the preceding table should be seen as only approximate, because:

- it is not possible to obtain comprehensive data for 1979 sales, although the estimates of the number of vehicles above the CDL are likely to be within 10 percent of the actual number. The greatest doubt attaches to the estimate of total SUV sales in 1979 - these vehicles were extremely utilitarian in 1979 and for key volume models it is not possible to identify volume for variants which might be seen as precursors to the modern SUV. Despite this, the number of SUVs in 1979 were very few relative to the number of passenger vehicles sold in that year as well as to the number of SUVs sold today
- it is also not possible to be exact in the number of vehicles above the CDL/LTT in 2003 and 2007. These estimates of the number of vehicles above the CDL/LTT are also likely to be within 10 percent of the actual number, while the total number of PMVs and SUVs sold are the total of the VFACTS PMV and SUV segments respectively for 2003 and 2007.

The figures which are estimated or are the sums of estimates, including the percentage calculations, have been rounded so as not to appear exact.

The data in the table indicates that there has been a dramatic increase in the number and proportion of vehicles affected by the CDL/LTT since 1979, with:

- the proportion of PMVs above the CDL/LTT rising from around 2.5 percent of PMV sales to about 8.0 percent
- the proportion of light vehicles sales, excluding light trucks, above the CDL/LTT rising from about 2.5 percent of sales to around 11 percent - more than a quadrupling of the proportion of these vehicles above the CDL/LTT over the period.

In combination with the results of the calculation from the LVI, this data clearly points to both:

- indexation of the CDL/LTT not keeping pace with the movements in vehicle prices
- a markedly increased proportion of vehicles being trapped above the CDL/LTT.

In addition to what the various indexes have illustrated, these factors point to a migration of sales of vehicles above the CDL/LTT, especially of vehicles now broadly in the $60,000 to $80,000 range.

7. Implications and conclusion

The automotive industry has often pointed to the implications of the luxury tax on vehicles. Some specific problems are:

- the luxury tax on vehicles is now a unique tax on just one product
- the tax interacts with three other elements of taxation - the Car Depreciation Limit, Fringe Benefits Tax and state stamp duties on vehicles - to markedly increase the complexity and incidence of taxation on this tranche of the vehicle market
- the luxury tax is seen by some companies and countries as a form of non tariff barrier which discriminates against certain types of imports. It is contradictory to the thrust of industry policy and the reduction in trade barriers undertaken by successive Australian Governments, both generally and for the automotive industry
- existence of this and the other taxes limit the scope for companies to improve the specifications, including advanced safety features, of the vehicles they make or import that are priced near or above the LTT.

These negatives have been compounded by the inadequacy of indexation since the introduction of the CDL, which has been indexed against the CPIMV.

The CPIMV may be a suitable measure from the point of view of constructing the total CPI, but it is not suited to the purpose of indexation of the CDL/LTT because of the impact of the adjustment for quality. After nearly 30 years of operation, the CDL/LTT is now obsolete, having been adjusted based on prices of effectively hypothetical cars, rather than on prices representative of what buyers are spending and need to spend in the purchase of new vehicles.

There are already some trends evident in vehicle prices which will intensify if the CDL/LTT is not abolished and/or substantially adjusted upwards, including:

- more vehicles are moving above the luxury tax threshold and high level variants of locally made large cars will increasingly move above the CDL/LTT - Holden Calais V8 is already above the threshold as are all FPV and HSV sedans
- variants of many 4 cylinder prestige luxury cars are progressively moving over the threshold
- many more SUVs moving above the threshold.

Attachment 1

The table below details some aspects of the methodology used in constructing the LVI and compares them with that used for the AIA/AAIR index.

Methodology for constructing AIA/AAIR and Luxury Tax indexes

Aspect	**AIA/AAIR Index**	**Luxury Vehicle Index**
Regimen	Cars selling >1,000 units in preceding year	Variants of vehicles >CDL/LTT selling: • >500 units a year in more than one year • >200 units a year for higher priced vehicles • vehicles not removed unless sales fall very low or fall below CDL/LTT
Inclusion/exclusion of models moving above and below CDL/LTT	Not relevant	Included if/when > CDL/LTT: • on inclusion use pre luxury price for preceding year if applicable • on exclusion include for first year of < CDL/LTT (to capture the price change)
Weighting	Units sold in current quarter	Units sold in current year
Representative variant	Usually: • the lowest priced variant • manual for light and small • automatic for others	Two major criteria: • lowest priced automatic variant • continuity of variants over the years of a model
Model change	Usually at a major model change (eg VL to VN Commodore) exclude model in introductory quarter. Not applicable to facelifts/upgrades	Aim to keep models in regimen every year, if possible: • if change in March or December quarter, treat intro/discontinued price as beginning/end of year price • if change around mid year and little difference in new and old price at intro, treat as though no model change • otherwise exclude for year
Luxury tax adjustment	Not applicable	The extra amount of tax caused by the luxury tax (in excess of the non luxury vehicle rate) was calculated and removed from the prices of the vehicles before the index was constructed

Notes on other indexes

In order to extend certain series over the full period since the introduction of the CDL/LTT it has been necessary to link data from different sources. The 2 series affected are listed below with brief descriptions of the linking process.

AIA/AAIR index
In order to extend this index back to 1979 the AIA/AAIR index has been linked to an adjusted CPIMV at December 1982.

The adjustment of the CPIMV up to the link point has been based on the average annual growth in the AIA/AAIR index from December 1982 to December 1987 relative to the growth in the CPIMV over the corresponding period - this results in the imputed AIA/AAIR index rising by about 1 percentage higher each year than the CPIMV for the 4 years affected.

AWE index
Average weekly earnings, total, all employees have been linked in 1983 to average weekly earnings, total, full time adult employees.

Attachment 2

CDL/LTT thresholds and index values

Series	CDL/LTT		CPIMV	AAI/AAIR	Family 6	Luxury vehicles	CPIAG	GDPID	AWE
Year	AUD	July	March year	December	December	December	March year	March year	March year
1979	18,000	100	100	100	100	100	100	100	100
1980	18,828	105	105	106	112	110	110	110	108
1981	19,732	110	110	112	116	115	121	120	122
1982	21,547	120	120	123	124	125	133	133	137
1983	23,357	130	130	135	151	136	148	149	155
1984	25,342	141	141	148	174	149	160	161	165
1985	26,660	148	148	157	174	155	166	169	181
1986	29,646	165	165	176	194	181	179	178	192
1987	34,775	193	193	214	233	224	196	190	205
1988	39,331	219	219	238	263	260	211	206	218
1989	42,910	238	239	254	292	278	226	225	234
1990	45,056	250	251	269	309	285	245	240	251
1991	45,462	253	253	281	329	289	260	250	268
1992	47,280	263	263	293	341	308	266	255	277
1993	48,215	268	269	301	347	319	269	259	285
1994	51,271	285	285	328	365	334	274	261	294
1995	52,912	294	294	338	379	345	281	264	306
1996	55,134	306	307	359	408	366	293	270	320
1997	55,134	306	301	359	415	369	299	274	332
1998	55,134	306	284	354	419	371	299	278	344
1999	55,134	306	270	353	419	374	303	279	357
2000	55,134	306	265	354	424	378	308	282	367
2001	55,134	306	260	343	419	365	324	295	383
2002	57,009	317	269	358	438	373	336	305	403
2003	57,009	317	269	366	459	377	347	313	424
2004	57,009	317	263	367	465	380	355	325	449
2005	57,009	317	255	368	474	386	364	335	467
2006	57,009	317	250	361	482	386	374	351	492
2007	57,123	317	251	358	489	388	387	367	506
2008	57,180	318	251	359	489	391	398	380	530
2008 LTT - AUD*	57,180		45,137	64,541	87,953	70,431	71,552	68,454	95,445

* Notional LTT if CDL/LTT adjustment had been made since introduction of the CDL based on the respective indexes

Attachment 3

Paasche indexes

The AIA/AAIR car price index and the Luxury Vehicle Index calculated in this study are both Paasche indexes.

The mathematical formula for a Paasche index is:

$$\sum(P_n.Q_n) \big/ \sum(P_o.Q_n)] \times 100$$

where P_n is the price of a variant in the latest period while P_o is the price of the same variant in the preceding period. Q_n is the sales volume for the variant in the latest period.

The **basket** or **regimen** of cars used to construct the index for a particular quarter consists of all the models which sell in significant volume and the sales volume of each of those models (i.e. all the Q_n's).

The $\sum(P_n.Q_n)$ is the estimated total amount consumers would have paid for that basket in the latest period while $\sum(P_o.Q_n)$ is the estimated total amount consumers would have paid for the same basket in the previous period.

The AIA/AAIR index is constructed based on end of quarter price data and sales volume during the quarter; for this index the previous period is the end of the preceding quarter for price.

LVI is based upon prices at end December each year and therefore the preceding period refers to the previous December, while the quantity is for the current year.

Attachment 4

Principal sources

The principal sources of data used in this Data Study are:

Automotive Industry Authority:

Report on the State of the Automotive Industry,

Annual, AGPS, Canberra

Final issue 1993

and

Press Release, Car Prices, Quarterly,

Final issue, March 1994

Australian Automotive Intelligence Report, various issues 1994 to 2008

Australian Bureau of Statistics:

Average Weekly Earnings, States and Australia (6302.0) Quarterly

Consumer Price Index (6401.0), Quarterly

In construction of the AIA/AAIR car price index and the Luxury Vehicle Index, the principal sources have been:

Glass's Guide, Passenger Vehicles, Monthly, and

Glass's Guide Complete, Autocomplete,

Glass's Guide Pty Ltd, Melbourne

VFACTS vehicle sales data,

Federal Chamber of Automotive Industries, Canberra

New vehicle registrations (to 1990),

PAXUS, Melbourne

New Motor Vehicle Registrations, cat no 9303.0, (various issues prior to 1990)

Australian Bureau of Statistics, Canberra

Data supplied from own records by various participating companies

BMW customised collection of PAXUS data (to 1990)