

10 Retail pricing analysis

Key points

- In 2011 and 2012 petrol price cycles in the four eastern mainland capital cities—Sydney, Melbourne, Brisbane and Adelaide—were characterised by considerable variability:
 - The day of the week on which price cycles peaked and troughed changed with almost every price cycle.
 - The duration of price cycles gradually increased to be over 12 days by September 2012.
- Perth was the exception to this pattern: it had stable price cycles (with each price cycle lasting seven days), and the day of the week on which price cycles peaked and troughed generally did not change.
- As in previous years, price cycle increases before public holidays in 2011–12 were on average no larger than the price increases in other weeks of the year.
- Analysis of data from January 2008 indicates that during periods of significant volatility in international benchmark prices and wholesale prices, retail petrol prices in Australia tend not to move—either up or down—by the same magnitude as wholesale prices.

10.1 Introduction

This chapter provides detailed analysis on a number of retail pricing issues. These include the regular petrol price cycles that occur in Australia's largest cities and the relationship between changes in wholesale prices and retail prices.¹²⁴

10.2 Price cycles

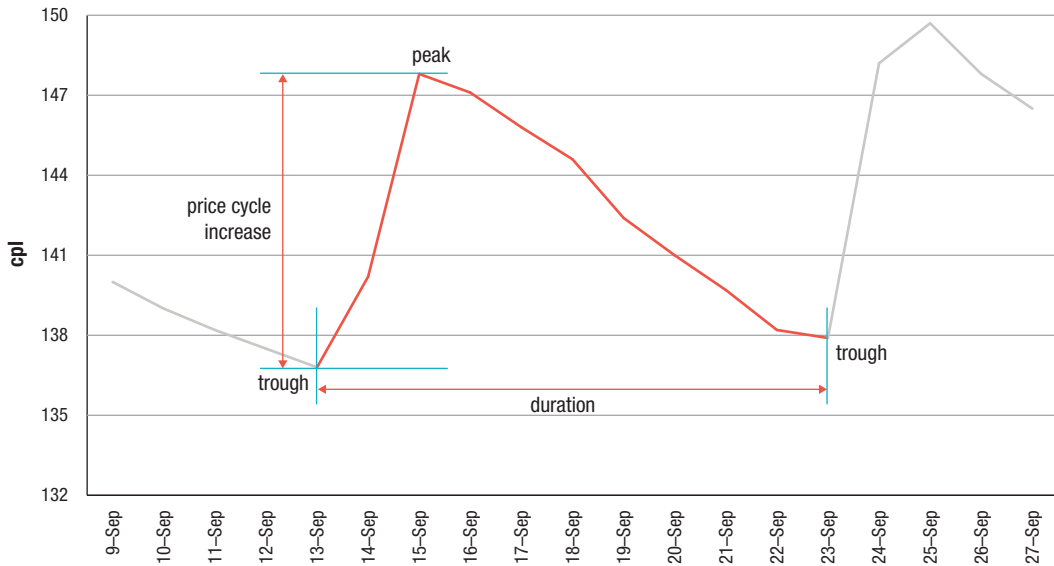
Price cycles are a prominent feature of petrol prices in Australia's largest cities. They occur only at the retail level; wholesale prices do not exhibit similar cyclical movements. Petrol price cycles are of concern to some consumers due to the large price increases that occur in a single day, and across most retail sites, on a regular basis. On the other hand, many consumers take advantage of the low point in the price cycle to purchase petrol at relatively low prices.

A petrol price cycle is a movement in price from a trough to a peak to a subsequent trough. The ACCC defines a price cycle as having occurred when the increase in price from the trough to the peak is 3 per cent or more of that trough price, and the decrease in price to the subsequent trough is also 3 per cent or more of the initial trough price. A price cycle increase is the increase in price from the initial trough to the peak. The duration of the price cycle is the number of days from the initial trough to the subsequent trough.

Chart 10.1 shows the elements of a petrol price cycle in Sydney in September 2011.

¹²⁴ All references to petrol in this chapter are to regular unleaded petrol (RULP). All references to the year 2012 are to the period 1 January 2012 to 30 September 2012.

Chart 10.1 Elements of a petrol price cycle, Sydney: 9 September to 27 September 2011



Source: ACCC analysis based on Informed Sources data

Detailed analysis of petrol price cycles was undertaken in previous ACCC petrol monitoring reports. This chapter extends that analysis to the end of September 2012. In particular, it considers the following elements of petrol price cycles in the five largest cities (Sydney, Melbourne, Brisbane, Adelaide and Perth):

- average price cycle increases
- the days of the week on which prices peak and trough
- the duration of price cycles
- the regularity (or otherwise) of price cycles
- consumer buying patterns during the price cycles
- the size of price cycle increases before public holidays.

10.3 Data on price cycles

Price cycle increases are calculated from daily average prices in each city. This means that the actual increase in price at any individual retail site in that city can vary from the average price cycle increase for the city.

There are three main influences on the size of price cycle increases:

- changes in wholesale prices—price cycle increases tend to be higher than average when underlying wholesale prices are increasing and lower than average when underlying wholesale prices are decreasing
- the extent of discounting before the price cycle increase
- the overall price level—for example, the absolute magnitude of the price cycle increase when prices are around 150 cents per litre (cpl) is likely to be higher than when prices are around 100 cpl.

Data on the number of price cycles and average price cycle increases in the five largest cities for the period 1 January 2011 to 30 September 2012 is shown in table 10.1.¹²⁵

Table 10.1 Average price cycle increase in cents per litre and as a percentage of average price, and number of price cycles—five largest cities: 2011 and 2012

	Sydney	Melbourne	Brisbane	Adelaide	Perth
Average price cycle increase (cpl)					
2011	9.5	11.4	8.8	13.7	8.1
2012	11.9	13.2	10.4	15.8	8.2
Price cycle increase as per cent of average annual price (%)					
2011	6.8	8.2	6.2	9.8	5.8
2012	8.4	9.4	7.1	11.1	5.7
Number of price cycles					
2011	42	42	39	37	52
2012	22	17	22	21	39

Source: ACCC analysis based on Informed Sources data

In 2011 the average price cycle increase was largest in Adelaide (13.7 cpl) and smallest in Perth (8.1 cpl). In 2012 average price cycle increases were greater than 10 cpl in all cities except Perth. As in 2011, Adelaide had the largest average price cycle increase (15.8 cpl) in 2012 and Perth had the smallest (8.2 cpl). As a percentage of annual average prices, the average price cycle increases were larger in 2012 compared with 2011 in all cities except Perth.

In 2011 Perth had a price cycle every week of the year, while the number of price cycles in the other cities was 42 or less. This was largely due to the longer duration of price cycles in recent years in the four eastern capital cities, and was also influenced by a number of price cycle failures.¹²⁶

In 2012 Perth again had a price cycle every week. The number of price cycles in the other cities was 22 or fewer over the 39-week period. In Melbourne, there were only 17 price cycles, reflecting a large increase in the duration of price cycles that occurred in the period, as well as three failed price cycles.

Table 10.1 shows that compared with the four eastern cities, Perth had more predictable price cycles with smaller average price cycle increases in both 2011 and 2012. Unlike other states, Western Australia has fuel price regulations under which retail sites must keep their prices constant for a 24-hour period and the price at each retail site is publicly available on the FuelWatch website. As a result of these arrangements, petrol retailers may adopt different pricing strategies from those employed in the eastern cities.

¹²⁵ The number of price cycles in a year is recorded as the number of peaks that occurred in that year. When comparing data across these cities, some locally specific factors need to be considered. For example, in Sydney, the number of retail sites selling regular unleaded petrol has been declining since October 2007 following the introduction of an ethanol mandate in New South Wales (see section 5.5).

¹²⁶ See section 10.6 for a description of failed price cycles.

10.4 Peaks and troughs by day of the week

This section examines the days of the week on which price cycles peaked and troughed in 2011 and 2012 and discusses the changes that have occurred.

10.4.1 Number of peaks and troughs by day of the week

Prior to 2010, price cycle peaks and troughs generally occurred on the same day each week. However, in 2011 and 2012 the troughs and peaks have varied over the week in the four eastern cities, reflecting the longer duration of price cycles. The converse is true for Perth: price cycles have become more regular and predictable in 2011 and 2012 compared with previous years.

Table 10.2 shows the number of troughs and peaks (and percentage of the annual total) on each day of the week in each of the five largest cities in 2011 and 2012.

Table 10.2 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, five largest cities: 2011 and 2012

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Sydney								
Trough								
2011	6 (14%)	2 (5%)	5 (12%)	8 (19%)	16 (38%)	1 (2%)	4 (10%)	42
2012	4 (17%)	4 (17%)	5 (22%)	1 (4%)	5 (22%)			23
Peak								
2011	9 (21%)	2 (5%)	2 (5%)	7 (17%)	5 (12%)	5 (12%)	12 (29%)	42
2012	3 (14%)		1 (5%)	5 (23%)	3 (14%)	6 (27%)	4 (18%)	22
Melbourne								
Trough								
2011	6 (14%)	3 (7%)	4 (10%)	7 (17%)	13 (31%)	5 (12%)	4 (10%)	42
2012	1 (6%)	3 (17%)	6 (33%)	1 (6%)	4 (22%)	1 (6%)	2 (11%)	18
Peak								
2011	6 (14%)	3 (7%)	5 (12%)	5 (12%)	7 (17%)	6 (14%)	10 (24%)	42
2012	3 (18%)	2 (12%)	1 (6%)	2 (12%)	3 (18%)	2 (12%)	4 (24%)	17
Brisbane								
Trough								
2011	7 (18%)	4 (10%)	2 (5%)	8 (21%)	14 (36%)	4 (10%)		39
2012	5 (23%)	2 (9%)	6 (27%)	3 (14%)	4 (18%)	1 (5%)	1 (5%)	22
Peak								
2011	6 (15%)	3 (8%)	3 (8%)	5 (13%)	5 (13%)	4 (10%)	13 (33%)	39
2012	4 (18%)	1 (5%)	1 (5%)	4 (18%)	3 (14%)	5 (23%)	4 (18%)	22
Adelaide								
Trough								
2011	7 (19%)	3 (8%)	4 (11%)	8 (22%)	12 (32%)	1 (3%)	2 (5%)	37
2012	1 (5%)	3 (14%)	6 (27%)	2 (9%)	4 (18%)		6 (27%)	22
Peak								
2011	3 (8%)		4 (11%)	7 (19%)	2 (5%)	10 (27%)	11 (30%)	37
2012	1 (5%)	3 (14%)	6 (29%)	2 (10%)	4 (19%)		5 (24%)	21
Perth								
Trough								
2011			52 (100%)					52
2012			39 (100%)					39
Peak								
2011				51 (98%)	1 (2%)			52
2012				36 (92%)	3 (8%)			39

Source: ACCC analysis based on Informed Sources data

The table shows that in the four eastern cities:

- with a few exceptions, price cycle peaks and troughs occurred every day of the week in 2011
- in 2011 the trough occurred most often on a Friday and the peak most often on a Sunday
- in 2012 the most common trough day was Wednesday, while the most common peak day varied across the cities.

In Perth:

- the price cycle trough always occurred on a Wednesday in 2011 and 2012
- the price cycle peak occurred on all but one Thursday in 2011 and all but three Thursdays in 2012. On the other four occasions the peak occurred on a Friday.

10.4.2 Changes in days of the week of peaks and troughs

Charts 10.2 to 10.11 identify the day of the week on which each price cycle peak and trough occurred in each of the five largest cities in the period 1 January 2011 to 30 September 2012. Each square in the charts depicts a peak (in light blue) or a trough (in dark blue) during each price cycle.

The charts highlight that in 2011 and 2012—with the exception of Perth—there has been no consistent pattern for peak and trough days.

In the four eastern cities, the following trends can broadly be seen:

- Price cycles were around seven days in duration in January to March 2011. At this time the peak and trough occurred around the same time each week for several weeks at a time.
- From April to June 2011, price cycles were around eight days in duration. The peak and trough days generally moved through the week.
- Since mid-2011 price cycle durations have gradually increased but durations have not been consistent. As a result, peak and trough days have been very unpredictable for consumers.

On the other hand, in Perth peak and trough days have been very predictable throughout 2011 and 2012. They have not moved through the week, as they have in the four eastern cities.

The stability of the weekly price cycle in Perth is a relatively recent phenomenon. Price cycles were largely absent in Perth for nearly a year prior to March 2009 and before that price cycles were around fourteen days in duration. In contrast, price cycles in all four eastern cities were generally seven days in duration prior to mid-2010. The duration of price cycles is considered in more detail in section 10.5.

Chart 10.2 Day of peak, Sydney: 1 January 2011 to 30 September 2012

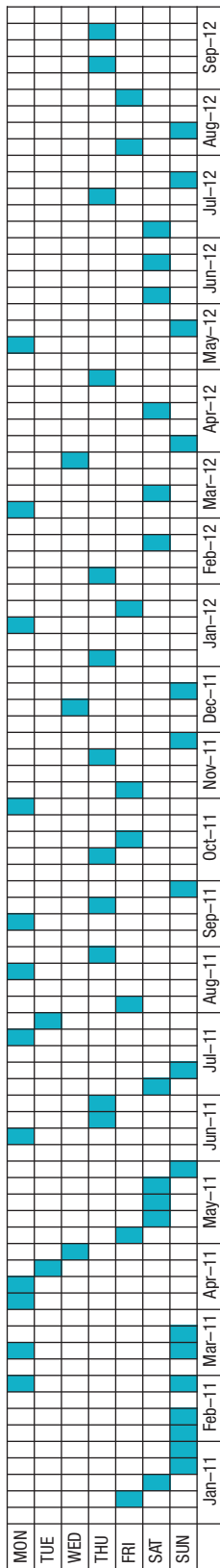


Chart 10.3 Day of trough, Sydney: 1 January 2011 to 30 September 2012

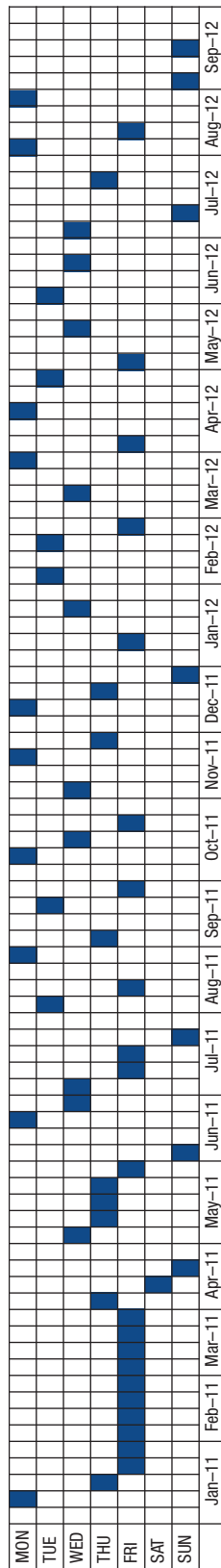


Chart 10.4 Day of peak, Melbourne: 1 January 2011 to 30 September 2012

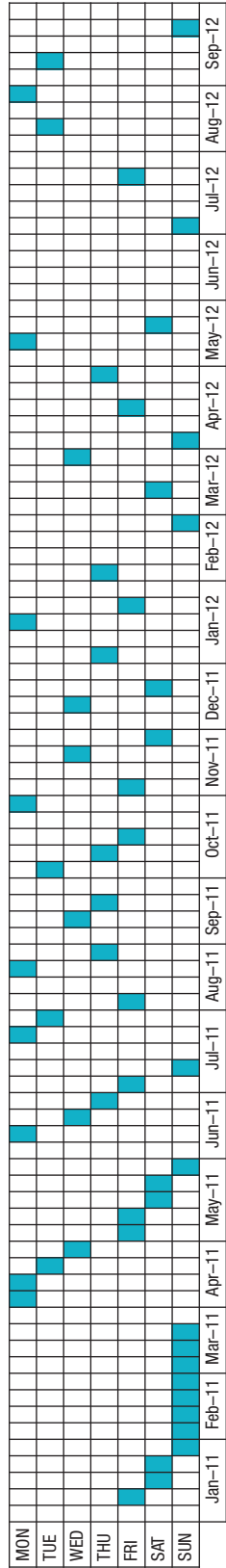


Chart 10.5 Day of trough, Melbourne: 1 January 2011 to 30 September 2012

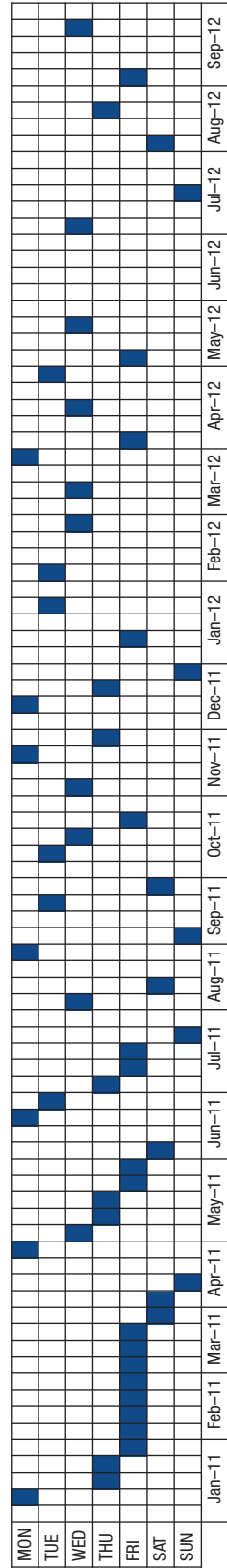


Chart 10.6 Day of peak, Brisbane: 1 January 2011 to 30 September 2012

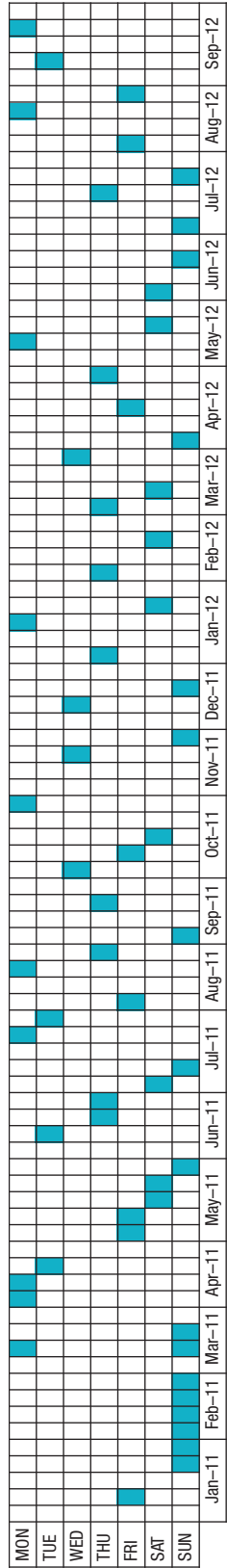


Chart 10.7 Day of trough, Brisbane: 1 January 2011 to 30 September 2012

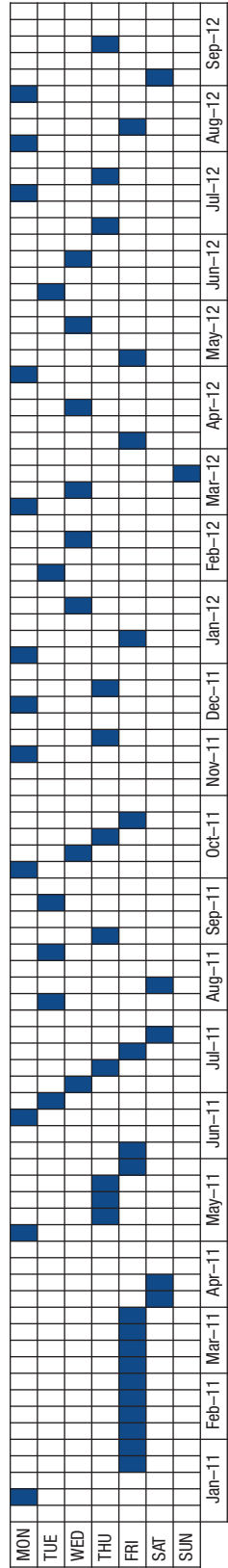


Chart 10.8 Day of peak, Adelaide: 1 January 2011 to 30 September 2012

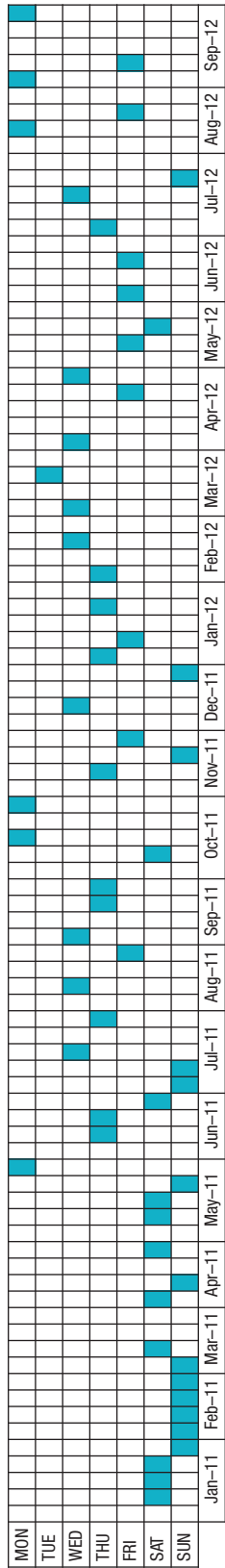


Chart 10.9 Day of trough, Adelaide: 1 January 2011 to 30 September 2012

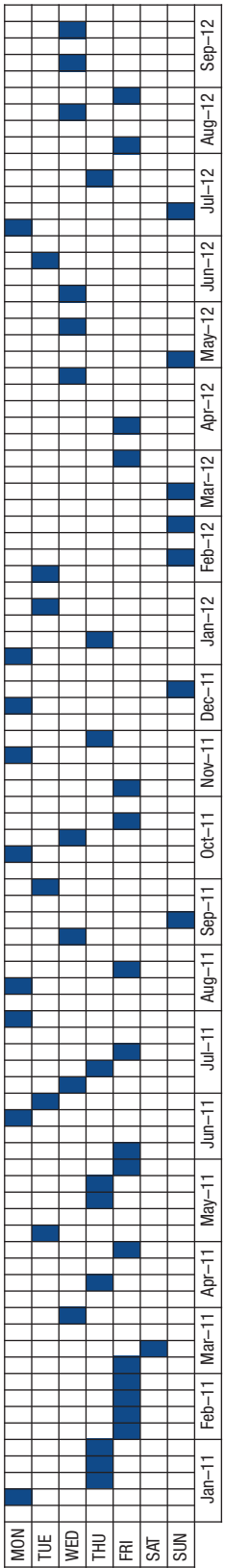


Chart 10.10 Day of peak, Perth: 1 January 2011 to 30 September 2012

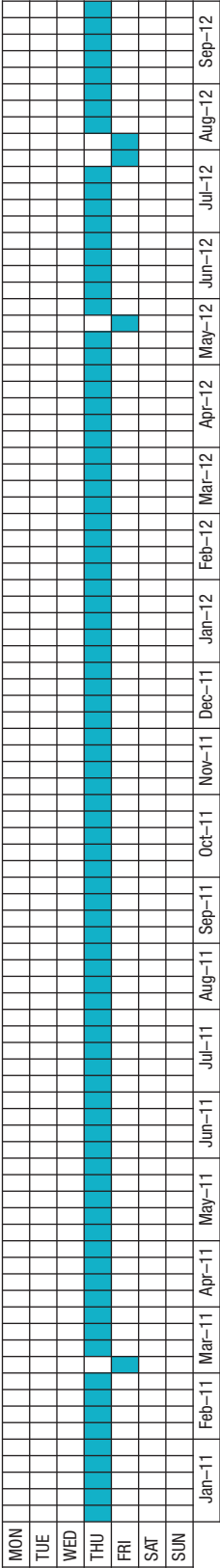
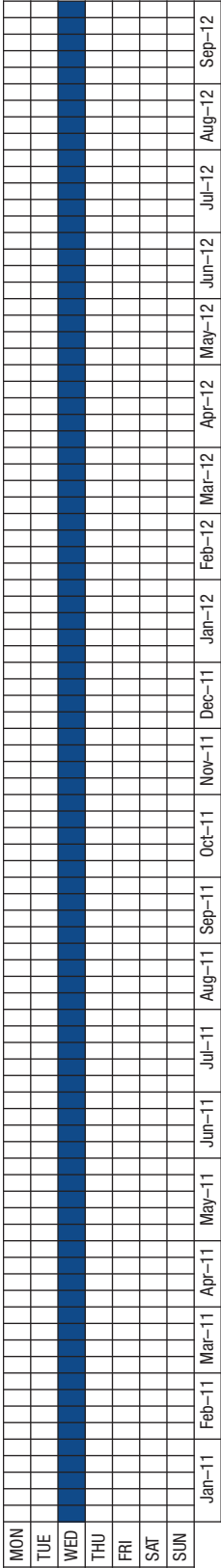


Chart 10.11 Day of trough, Perth: 1 January 2011 to 30 September 2012



Source: ACCC analysis based on Informed Sources data

Note: Each light blue square depicts the peak of a price cycle and each dark blue square depicts the trough of a price cycle.

10.5 Duration of price cycles

A feature of petrol price cycles in recent years has been the increase in the duration of price cycles in Sydney, Melbourne, Brisbane and Adelaide, while price cycle durations in Perth have remained largely unchanged. This section analyses the duration of regular price cycles in the five largest cities between the March 2009 quarter and the September 2012 quarter.

10.5.1 Methodology

As noted in section 10.2, a price cycle is a movement in price from the trough to a peak to a subsequent trough. The duration of a price cycle is therefore the number of days between the two troughs.

This analysis of price cycle durations excludes the influence of the failed price cycles (as defined in section 10.6) that occurred in these cities during this time. Failed price cycles can have a significant effect on the duration of price cycles. In the event of a failed price cycle, the duration of the price cycle immediately preceding or succeeding it will be much larger than it otherwise would have been. These longer price cycles have been removed from the analysis. With the influence of failed price cycles removed it is possible to observe a more illustrative trend of how price cycle durations have changed since January 2009.¹²⁷

10.5.2 Analysis

Tables 10.3 to 10.7 show the quarterly and annual average duration of regular price cycles in the five largest cities between the March 2009 quarter and the September 2012 quarter. They also show the average number of days from trough to peak and the average number of days from peak to trough.¹²⁸

Charts 10.12 to 10.16 show the duration of each regular price cycle in the five largest cities during this period.

¹²⁷ There were a total of 38 failed price cycles in these cities between January 2009 and September 2012. In Sydney, six price cycles failed in 2010. In Melbourne, four price cycles failed in 2010 and three in 2012. In Brisbane, one cycle failed in 2009, three in 2010 and three in 2011. In Adelaide, two cycles failed in 2010, six in 2011 and two in 2012. In Perth, four price cycles failed in both 2009 and 2010. The failed cycle in Brisbane in 2009 occurred in the first week of the year and affected the duration of the last price cycle in 2008. It had no influence on price cycle durations in 2009.

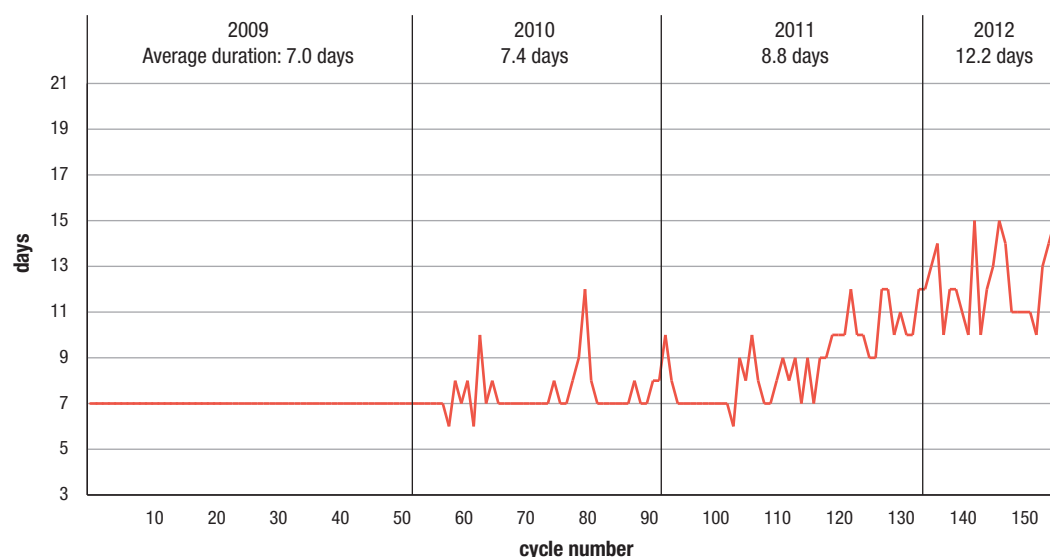
¹²⁸ The sum of the average trough to peak duration and the average peak to trough duration may not equal the average price cycle duration due to rounding.

Table 10.3 Quarterly and annual average price cycle duration, trough–peak duration and peak–trough duration, Sydney: March 2009 to September 2012 quarter

	Average cycle duration	Average duration trough–peak	Average duration peak–trough
Mar 2009	7.0	1.2	5.8
Jun 2009	7.0	1.8	5.2
Sep 2009	7.0	2.0	5.0
Dec 2009	7.0	2.0	5.0
2009	7.0	1.8	5.2
Mar 2010	7.0	2.1	4.9
Jun 2010	7.4	2.1	5.3
Sep 2010	8.0	2.2	5.8
Dec 2010	7.3	1.9	5.4
2010	7.4	2.1	5.3
Mar 2011	7.3	2.4	4.8
Jun 2011	8.2	2.3	5.9
Sep 2011	9.6	2.7	6.9
Dec 2011	10.6	2.8	7.8
2011	8.8	2.5	6.2
Mar 2012	12.0	2.7	9.3
Jun 2012	12.5	3.3	9.3
Sep 2012	12.1	3.6	8.6
2012	12.2	3.2	9.0

Source: ACCC analysis based on Informed Sources data

Chart 10.12 Duration of price cycles, Sydney: January 2009 to September 2012



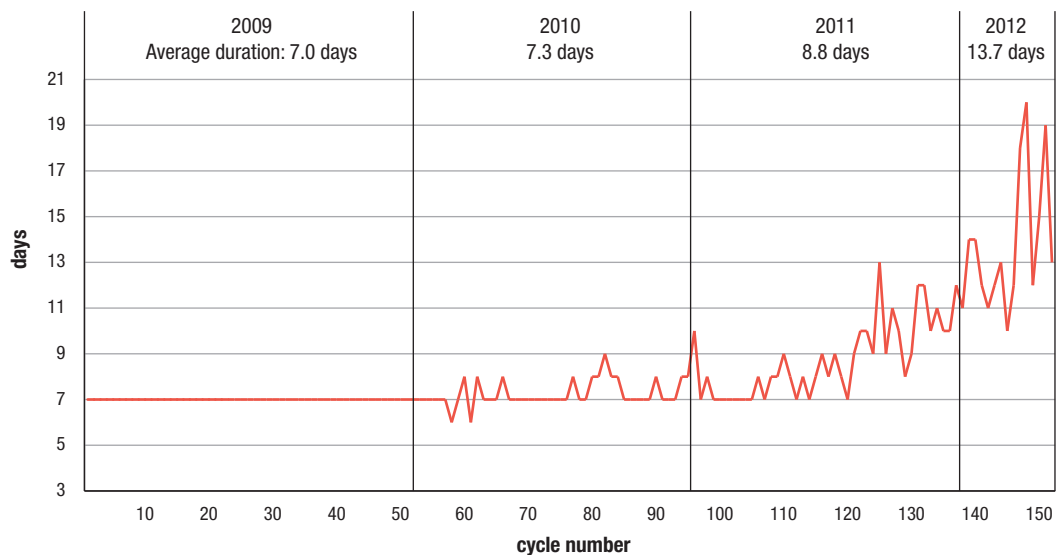
Source: ACCC analysis based on Informed Sources data

Table 10.4 Quarterly and annual average price cycle duration, trough–peak duration and peak–trough duration, Melbourne: March 2009 to September 2012 quarter

	Average cycle duration	Average duration trough–peak	Average duration peak–trough
Mar 2009	7.0	1.4	5.6
Jun 2009	7.0	2.0	5.0
Sep 2009	7.0	2.0	5.0
Dec 2009	7.0	2.0	5.0
2009	7.0	1.8	5.2
Mar 2010	6.9	2.0	4.9
Jun 2010	7.2	1.8	5.3
Sep 2010	7.7	2.0	5.7
Dec 2010	7.3	1.6	5.6
2010	7.3	1.9	5.4
Mar 2011	7.4	2.2	5.3
Jun 2011	8.1	1.8	6.3
Sep 2011	9.6	2.3	7.3
Dec 2011	10.4	2.3	8.1
2011	8.8	2.1	6.6
Mar 2012	12.4	3.0	9.4
Jun 2012	11.8	2.3	9.5
Sep 2012	16.2	4.0	12.2
2012	13.7	3.2	10.5

Source: ACCC analysis based on Informed Sources data

Chart 10.13 Duration of price cycles, Melbourne: January 2009 to September 2012



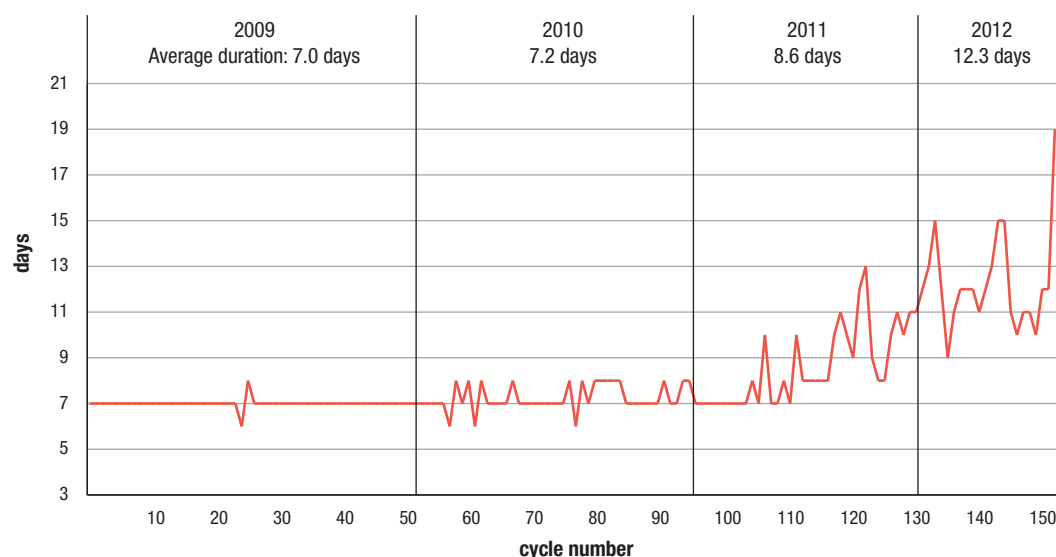
Source: ACCC analysis based on Informed Sources data

Table 10.5 Quarterly and annual average price cycle duration, trough–peak duration and peak–trough duration, Brisbane: March 2009 to September 2012 quarter

	Average cycle duration	Average duration trough–peak	Average duration peak–trough
Mar 2009	7.0	1.8	5.2
Jun 2009	6.9	2.0	4.9
Sep 2009	7.1	2.0	5.1
Dec 2009	7.0	2.0	5.0
2009	7.0	2.0	5.0
Mar 2010	7.0	2.1	4.9
Jun 2010	7.2	2.0	5.2
Sep 2010	7.6	1.9	5.7
Dec 2010	7.3	1.9	5.4
2010	7.2	2.0	5.3
Mar 2011	7.1	2.2	4.9
Jun 2011	8.0	2.4	5.6
Sep 2011	9.8	2.6	7.2
Dec 2011	9.9	2.4	7.4
2011	8.6	2.4	6.2
Mar 2012	12.0	2.9	9.1
Jun 2012	12.9	3.0	9.9
Sep 2012	12.0	3.4	8.6
2012	12.3	3.1	9.2

Source: ACCC analysis based on Informed Sources data

Chart 10.14 Duration of price cycles, Brisbane: January 2009 to September 2012



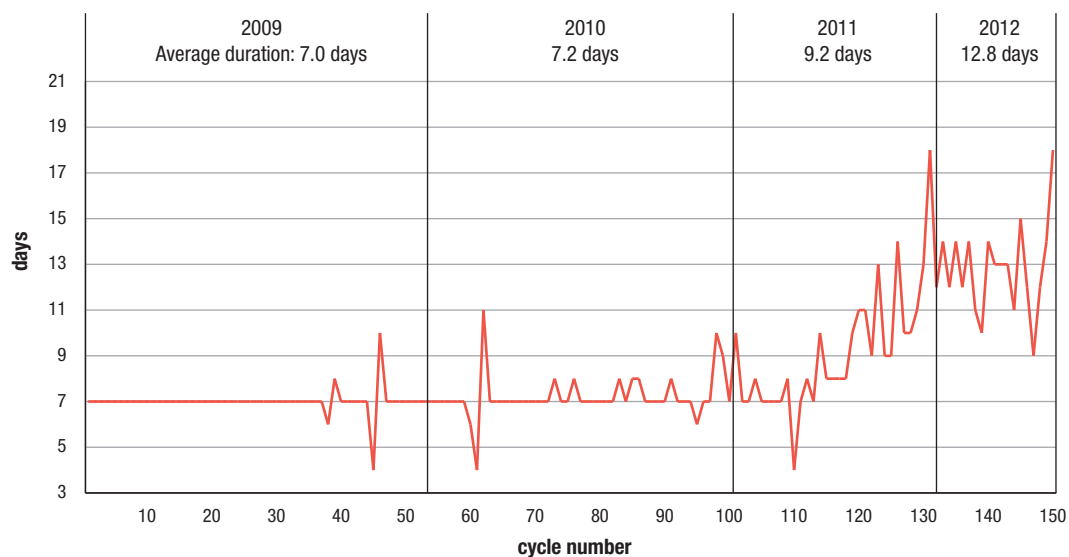
Source: ACCC analysis based on Informed Sources data

Table 10.6 Quarterly and annual average price cycle duration, trough–peak duration and peak–trough duration, Adelaide: March 2009 to September 2012 quarter

	Average cycle duration	Average duration trough–peak	Average duration peak–trough
Mar 2009	7.0	1.0	6.0
Jun 2009	7.0	1.0	6.0
Sep 2009	7.0	1.5	5.5
Dec 2009	7.0	2.0	5.0
2009	7.0	1.4	5.6
Mar 2010	7.0	2.4	4.6
Jun 2010	7.2	2.2	5.0
Sep 2010	7.3	2.4	4.9
Dec 2010	7.4	2.2	5.2
2010	7.2	2.3	4.9
Mar 2011	7.6	2.1	5.4
Jun 2011	7.4	2.3	5.1
Sep 2011	10.0	2.6	7.4
Dec 2011	11.8	3.1	8.6
2011	9.2	2.5	6.6
Mar 2012	13.0	3.2	9.8
Jun 2012	12.3	2.7	9.7
Sep 2012	13.0	3.0	10.0
2012	12.8	2.9	9.8

Source: ACCC analysis based on Informed Sources data

Chart 10.15 Duration of price cycles, Adelaide: January 2009 to September 2012



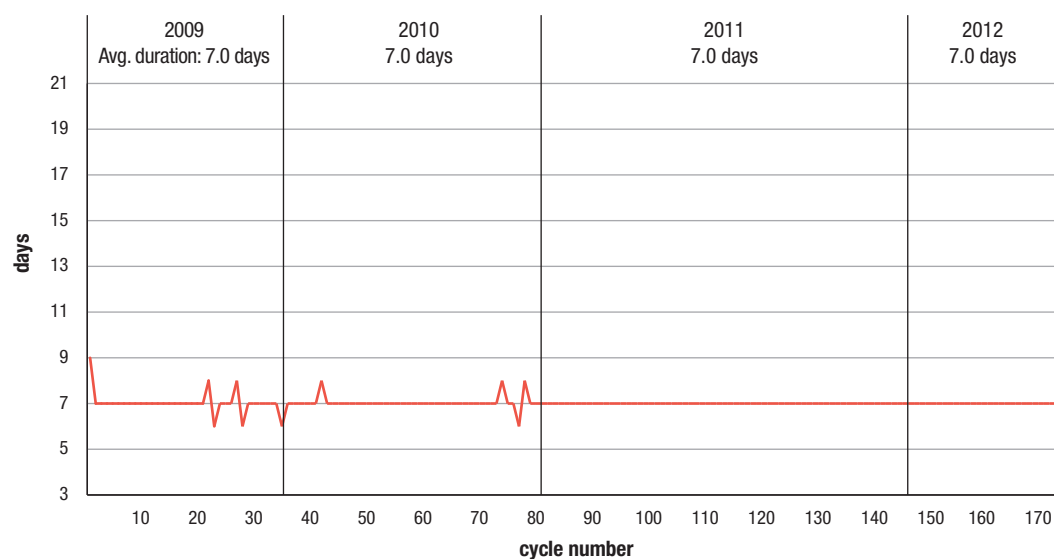
Source: ACCC analysis based on Informed Sources data

Table 10.7 Quarterly and annual average price cycle duration, trough–peak duration and peak–trough duration, Perth: March 2009 to September 2012 quarter

	Average cycle duration	Average duration trough–peak	Average duration peak–trough
Mar 2009	8.0	4.5	3.5
Jun 2009	7.0	3.0	4.0
Sep 2009	7.0	3.0	4.0
Dec 2009	6.9	2.7	4.2
2009	7.0	3.0	4.0
Mar 2010	7.1	3.3	3.9
Jun 2010	7.0	2.0	5.0
Sep 2010	7.0	1.9	5.1
Dec 2010	7.1	1.9	5.2
2010	7.0	2.2	4.9
Mar 2011	7.0	1.1	5.9
Jun 2011	7.0	1.0	6.0
Sep 2011	7.0	1.0	6.0
Dec 2011	7.0	1.0	6.0
2011	7.0	1.0	6.0
Mar 2012	7.0	1.0	6.0
Jun 2012	7.0	1.1	5.9
Sep 2012	7.0	1.2	5.8
2012	7.0	1.1	5.9

Source: ACCC analysis based on Informed Sources data

Chart 10.16 Duration of price cycles, Perth: March 2009 to September 2012



Source: ACCC analysis based on Informed Sources data

Change in price cycle durations

In the four eastern cities:

- In 2009 the duration of price cycles was always seven days in Sydney and Melbourne and generally seven days in Brisbane and Adelaide. The average annual price cycle duration was seven days in each city.
- In 2010 the duration of price cycles became more variable, with price cycles more frequently being longer than seven days. The average annual price cycle duration was over seven days in each city.
- In 2011 there was a noticeable increase in the average duration of price cycles in the September 2011 quarter in all four cities. It increased from around seven or eight days to around 10 days. The average annual price cycle duration was close to nine days in each city.
- In the first three quarters of 2012 the average quarterly durations continued to increase. The average price cycle duration in the first three quarters of 2012 was over 12 days in each city.
- Overall, between the March 2009 and September 2012 quarters, average quarterly price cycle durations increased by five days or more.
 - In all cities the average duration in the March 2009 quarter was seven days. By the September 2012 quarter this had increased to around 12 days in Sydney and Brisbane, around 13 days in Adelaide and around 16 days in Melbourne.

In contrast, in Perth average quarterly price cycle durations between the March 2009 and September 2012 quarters remained largely constant at seven days. The duration of price cycles was largely seven days in 2009 and 2010 and always seven days in subsequent years.

Change in trough–peak and peak–trough durations

In the four eastern cities:

- In 2009 each city generally had seven day price cycles, and the average trough to peak duration was around two days and the average peak to trough duration was around five days.
- By the first three quarters of 2012 these cities generally had 12-day price cycles and the average trough to peak duration was around three days (an increase of one day) and the average peak to trough duration was around nine to 10 days (an increase of four to five days).
- While the duration of price cycles has increased between the March 2009 and September 2012 quarters, the proportion of time in the trough to peak movement (around 20–30 per cent) and in the peak to trough movement (around 70–80 per cent) has not materially changed.

The story is different in Perth, which generally had seven day price cycles over the whole period. In 2009 the average trough to peak duration was three days and the average peak to trough duration was four days. By the first three quarters of 2012 the average trough to peak duration was around one day (a decrease of two days) and the average peak to trough duration was around six days (an increase of two days).

- The proportion of time in the trough to peak movement in Perth decreased from around 43 per cent in 2009 to around 16 per cent in 2012.
 - This indicates that the shape of the price cycle in Perth has changed substantially since 2009.

10.5.3 Factors that may have contributed to the change in the price cycle

The 2010 ACCC petrol monitoring report noted that the ACCC had sought the views of the major petrol retailers in September 2010 about reasons for the change in the pattern of the price cycle in 2010.¹²⁹ Factors identified by a number of retailers included:

- an increase in the degree of retail price competition
- some retailers had been delaying price increases until later in the week in order to increase their market share.

The report also noted that the ACCC's decision in late 2009 to oppose the sale of Mobil's retail assets to Caltex may also have led to a greater degree of uncertainty in the industry.

In January 2012 the ACCC again sought the views of the major petrol retailers about reasons for the change in the pattern of the price cycles. The same factors identified in September 2010 were also mentioned in January 2012. Other factors identified were:

- changes in the pricing behaviour of the supermarkets (such as remaining at the bottom of the price cycle longer and increased use of shopper docket with a value greater than 4.0 cpl)
- a greater sensitivity among consumers of high petrol prices.

If some retailers delay putting up their prices, other retailers respond to this delay in the current and subsequent price cycles. Over time, this can lead to the movement through the week of trough and peak days of the price cycle and a longer duration of price cycles. It may also increase uncertainty in the market and lead to a degree of instability with retailers unsure about the behaviour of the market and the response of competitors.

10.6 Regularity of price cycles

This section analyses price cycles in 2011 and 2012 to determine the extent to which there have been regular, failed and truncated price cycles.

Regular cycles

The typical pattern of the petrol price cycle in the five largest cities in recent years has been one where prices increase quickly at the outset (over one to three days) and then steadily decrease over the rest of the cycle (between six and nine days); that is, they move in a 'sawtooth' pattern. This is classified as a 'regular' price cycle. During regular price cycles, most market participants increase prices within a few days of each other. Generally, a small number of retailers increase their prices first and the rest of the market follows.

Irregular cycles

There are a number of price cycles that could be considered to be irregular. These can be classified as 'failed' or 'truncated' price cycles. These types of price cycles are often associated with relatively lower prices, ostensibly due to strong price competition between retailers.

Failed and truncated price cycles can occur because some market participants do not increase prices at the time that might be expected during a regular price cycle. This can lead to price cycles taking longer to occur (or not occur at all), or to a collapse in the price cycle (as those retailers that increased their prices first notice that the rest of the market has not followed them, and subsequently they decrease their prices).

¹²⁹ See ACCC, *Monitoring of the Australian petroleum industry*, December 2010, p. 180.

10.6.1 Methodology

Price cycles have been classified into three broad categories:

- **Regular:** this is a price cycle which meets the 3 per cent definition (referred to in section 10.2), where the peak occurs at a time when a peak might have been expected, and where the regular sawtooth pattern is apparent.
- **Truncated:** this is a price cycle which meets the 3 per cent definition, where the peak occurs at a time when a peak might have been expected, but the typical sawtooth pattern is shortened (that is, there is a return to a lower price within one or two days of the trough to peak movement). Generally, the price cycle increase is significantly lower than might have been expected.
- **Failed:** this is where there is a small (or no) increase in price, at a time when an increase might have been expected, and the magnitude of the price increase (if any) does not meet the 3 per cent definition.

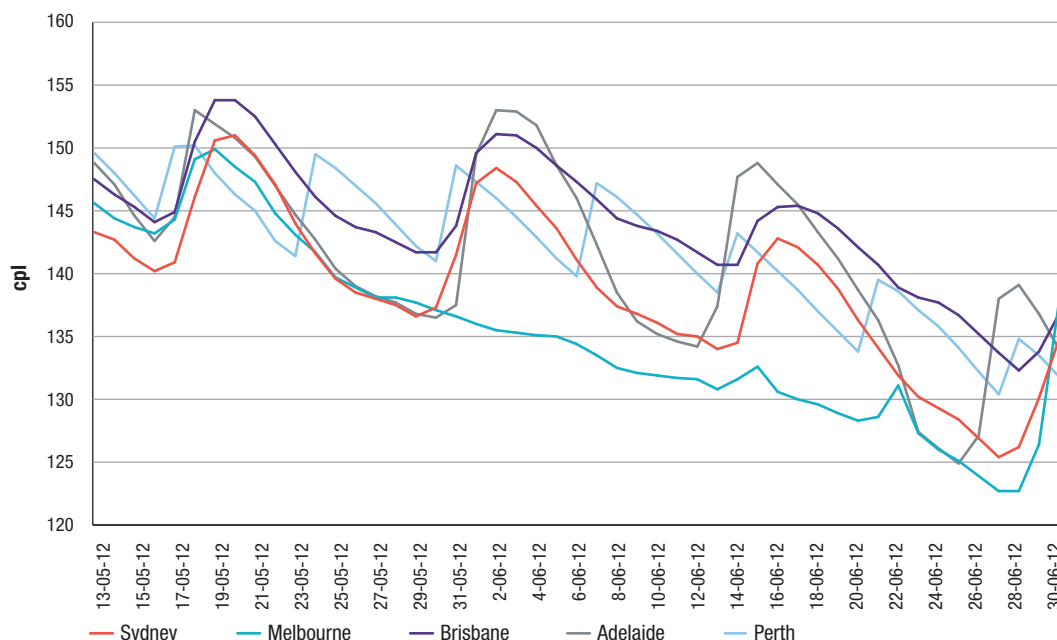
10.6.2 Example of regular and failed price cycles

Chart 10.17 shows daily average retail petrol prices in the five largest cities for the period 13 May to 30 June 2012. There were regular and failed price cycles during this period.

The chart indicates that:

- Price cycles in Sydney, Brisbane, Adelaide and Perth were broadly regular in pattern.
- In Melbourne (the aqua line in the chart) there were two failed cycles.
- The average duration of price cycles in Sydney, Brisbane and Adelaide was almost twice that of the price cycles in Perth.

Chart 10.17 Daily average petrol prices in the five largest cities: 13 May 2012 to 30 June 2012



Source: ACCC based on Informed Sources data

10.6.3 Classification of price cycles in 2011 and 2012

Table 10.8 indicates the classification of price cycles in the five largest cities in 2011 and 2012.

Table 10.8 Classification of price cycles in the five largest cities: 2011 and 2012

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Total
Regular						
2011	40	42	39	35	52	208
2012	22	17	22	21	39	121
Truncated						
2011	2	–	–	2	–	4
2012	–	–	–	–	–	–
Failed						
2011	–	–	3	6	–	9
2012	–	3	–	2	–	5

Source: ACCC analysis based on Informed Sources data

In 2011 and 2012:

- there were 14 failed price cycles
 - Adelaide had six failed price cycles in 2011 and Brisbane had three
 - in 2012 only two cities had failed price cycles: Melbourne (three) and Adelaide (two)
- there were four truncated price cycles in 2011: two each in Adelaide and Sydney
- no truncated price cycles occurred in any city in 2012
- altogether there were a total of 18 failed and truncated price cycles in the five largest cities in the period.
 - more than half of these occurred in Adelaide (two truncated and eight failed cycles)
- Perth had regular price cycles every week during the period.

The occasions in the second half of 2011 and the first half of 2012 when failed price cycles occurred in Sydney, Melbourne, Brisbane and Adelaide can be seen in the charts at appendix G.

10.7 Consumer buying patterns during the price cycle

This section provides information on the volume of retail petrol sales and the average price of petrol by day of the week in the five largest cities in 2011–12.

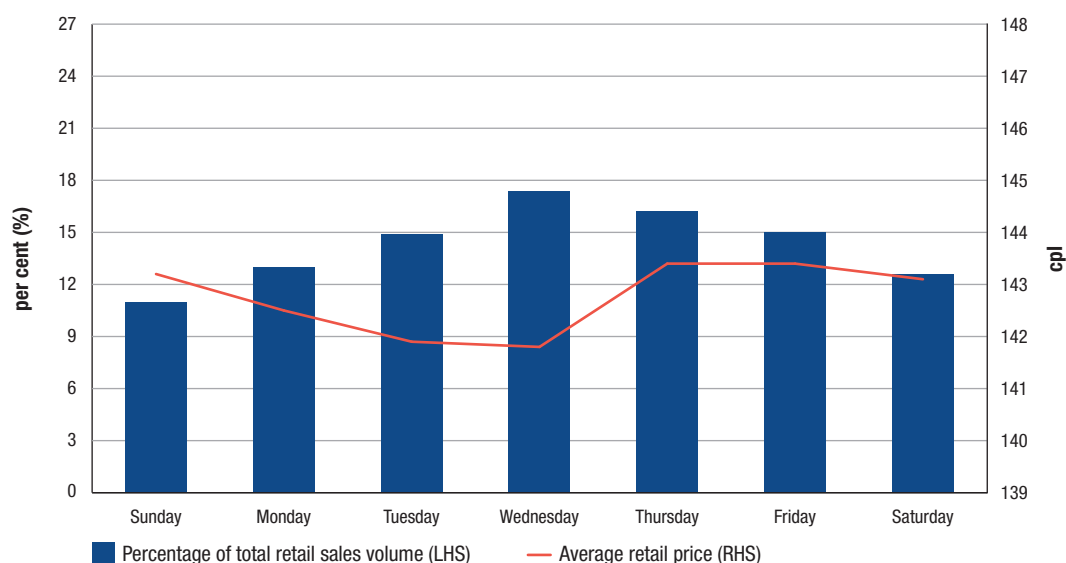
In Perth, the cheapest day of the week to buy petrol was always Wednesday, and the most expensive day was almost always Thursday. Therefore, consumers in Perth had the opportunity to take advantage of petrol price cycles by buying relatively cheap petrol on Wednesday each week.

In contrast, in the four eastern cities, the days of the week on which price cycles peaked and troughed varied from week to week in 2011–12. As noted in section 10.5.2 the average duration of price cycles in these cities was over 12 days in 2012. Therefore, there were many weeks which had neither a peak nor a trough.

10.7.1 Average petrol sales and volumes by day of the week by city

Chart 10.18 shows the percentage of average sales volumes and average retail petrol prices by day of the week in 2011–12 in the five largest cities in aggregate.

Chart 10.18 Average petrol sales volumes and prices by day of the week, five largest cities: 2011–12



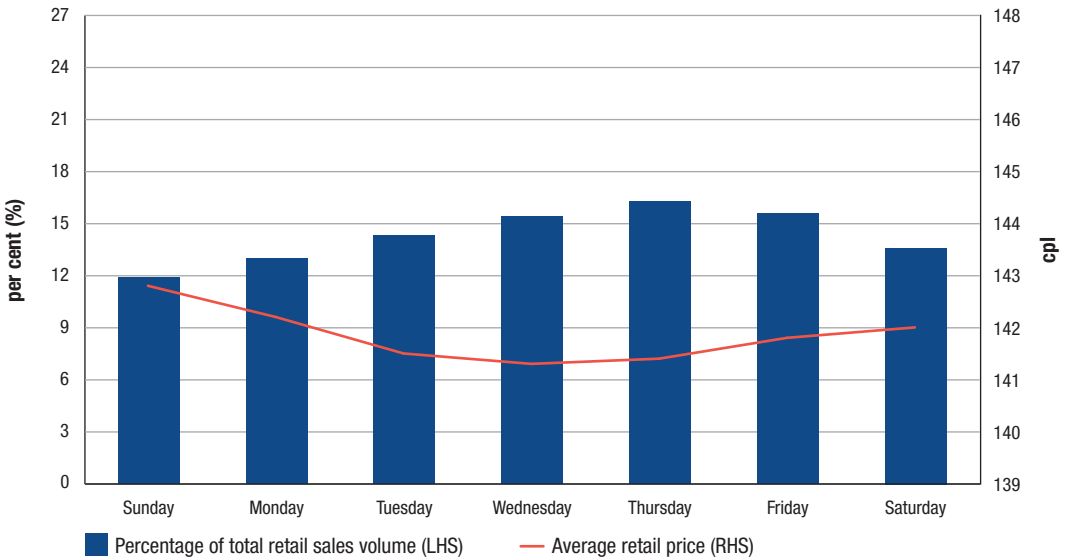
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

There was a smaller variation in average retail prices from day to day over the week in 2011–12 compared with the previous year—1.6 cpl in 2011–12 compared with 3.4 cpl in 2010–11.

There was also a slightly more uniform pattern of sales volumes over the week in 2011–12—they ranged from a low of 11 per cent (on Sunday) to a high of 17 per cent (on Wednesday) in 2011–12, compared with a range of 10 per cent to 18 per cent in 2010–11.

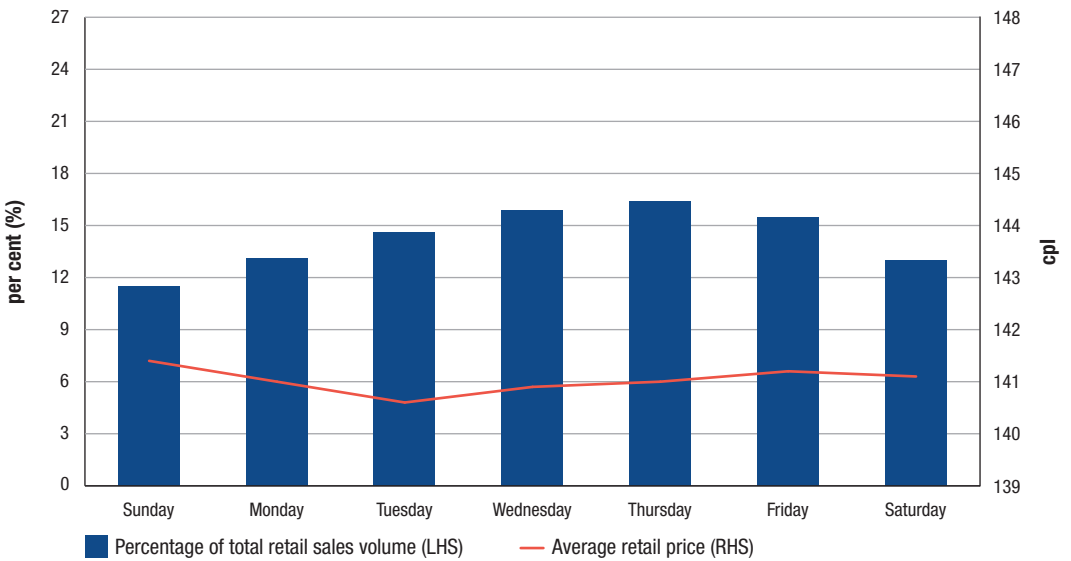
The flattening in the shape of sales volumes and prices over the week reflects the increasing duration of petrol price cycles in the eastern capital cities in 2011–12. This is evident from charts 10.19 to 10.22, which show the percentage of average sales volumes and average retail petrol prices by day of the week in 2011–12 in each of the eastern capital cities.

Chart 10.19 Average petrol sales volumes and prices by day of the week, Sydney: 2011–12



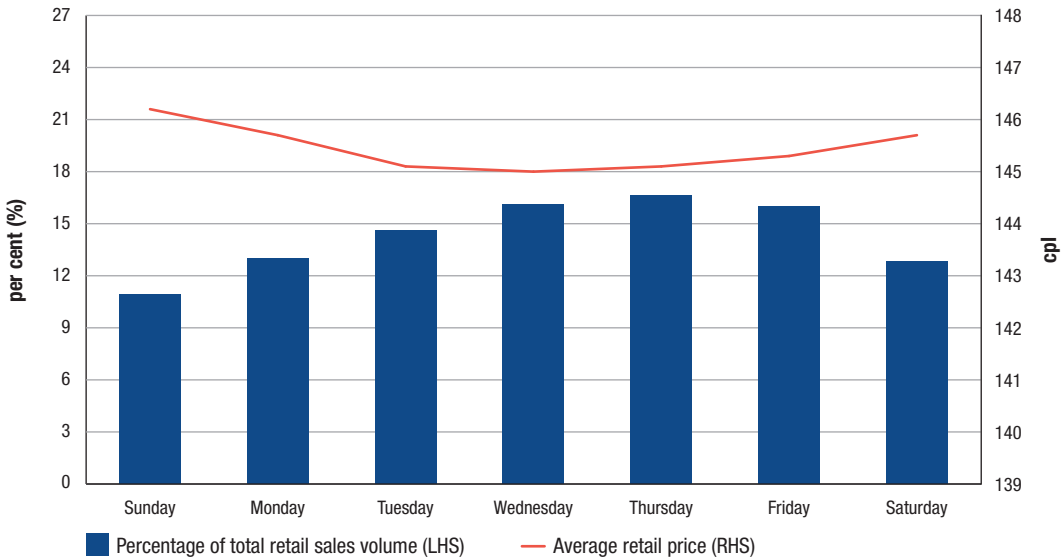
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

Chart 10.20 Average petrol sales volumes and prices by day of the week, Melbourne: 2011–12



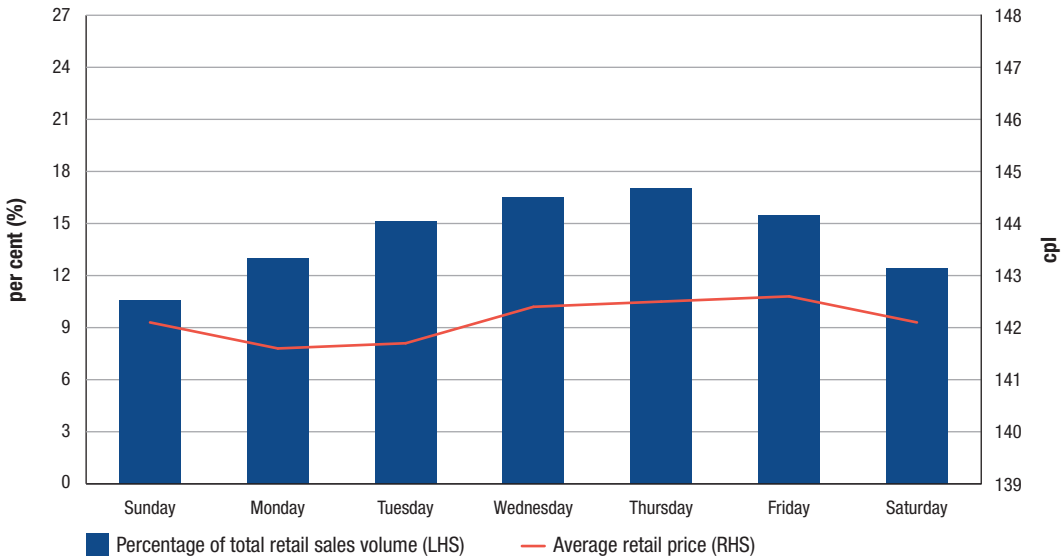
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

Chart 10.21 Average petrol sales volumes and prices by day of the week, Brisbane: 2011–12



Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

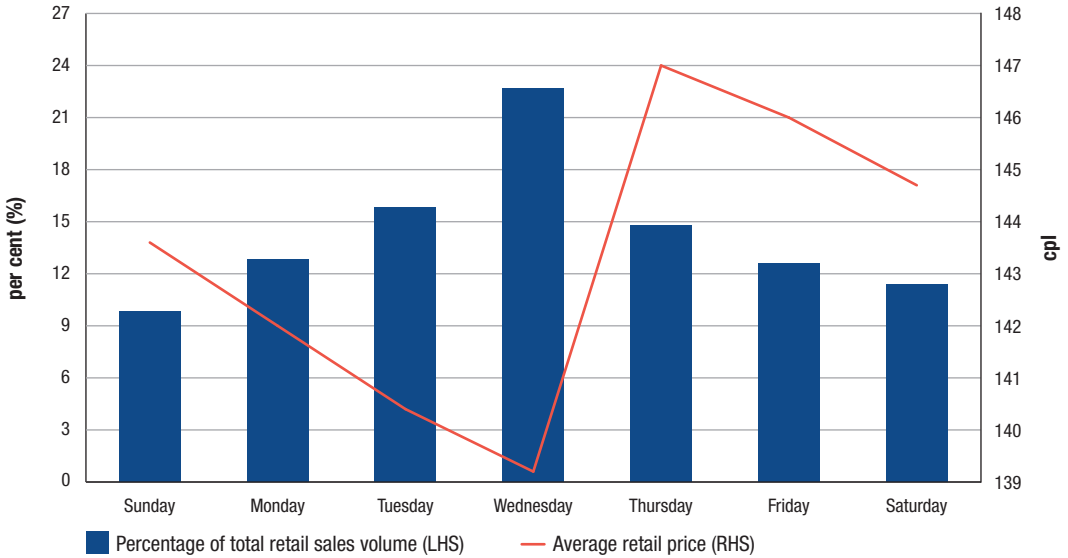
Chart 10.22 Average petrol sales volumes and prices by day of the week, Adelaide: 2011–12



Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

In contrast to the eastern capital cities, Perth—which has regular seven-day petrol price cycles—exhibited a clear inverse relationship between average prices and sales volumes over the week (see chart 10.23). The variation in average retail prices from day to day over the week was 7.8 cpl—from a high of 147.0 cpl on Thursday to a low of 139.2 cpl on Wednesday. The variation in sales volumes ranged from 23 per cent (on Wednesday) to around 9 per cent on Sunday.

Chart 10.23 Average petrol sales volumes and prices by day of the week, Perth: 2011–12



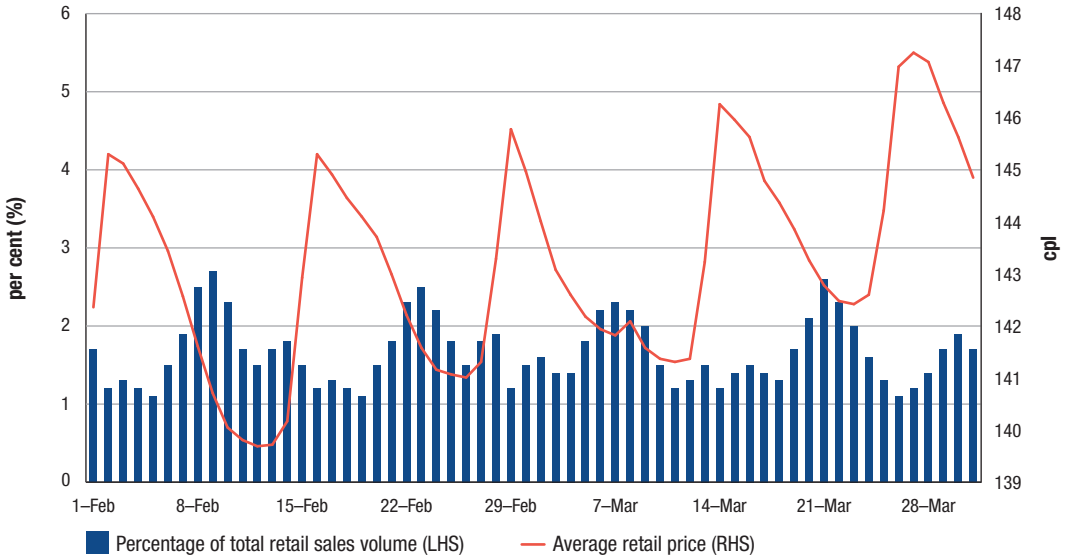
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

10.7.2 Average petrol sales and volumes over a two-month period

Daily average petrol prices and daily volumes of petrol sold in Adelaide and Perth were analysed over a two-month period to see how consumers responded to price levels during each price cycle.

Chart 10.24 shows daily average petrol sales (as a percentage of total sales for the period) and average retail petrol prices in Adelaide for the period 1 February to 31 March 2012. During this period, the duration of each price cycle in Adelaide varied from 13 to 14 days.

Chart 10.24 Daily average petrol sales volumes and prices, Adelaide: 1 February to 31 March 2012



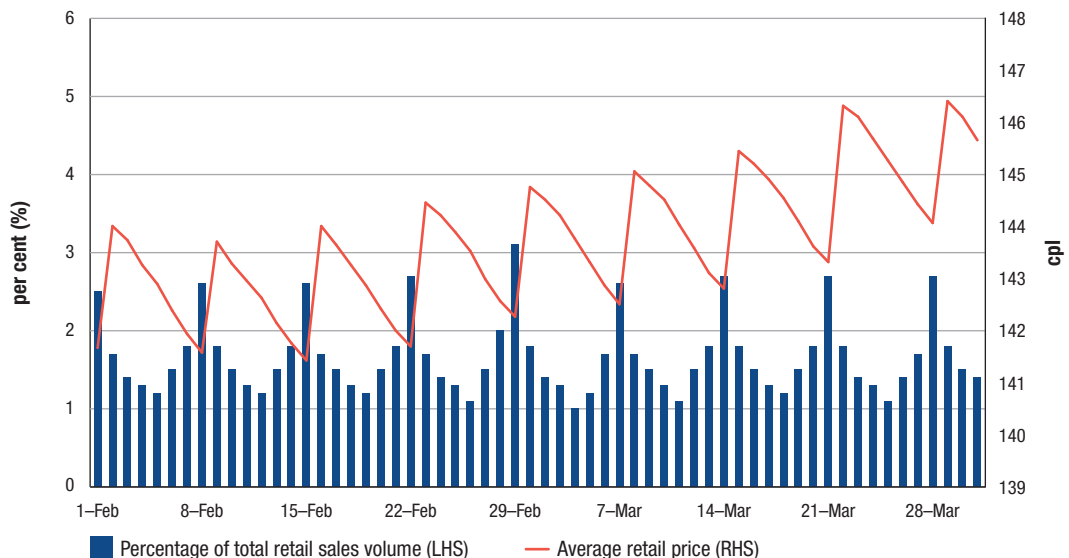
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

The chart shows that:

- there was a broadly inverse relationship between price levels and volumes of petrol sold
 - however, the highest volumes sold occurred on average three days before the trough of the price cycle
- there were lower volumes of petrol sold at the peak of the price cycle and a few days thereafter
- this pattern of buying shows that while consumers in Adelaide tended to purchase higher volumes on the cheaper days of the price cycle, they tend to purchase petrol before the trough price. This suggests that the longer and more variable price cycles in Adelaide have made it difficult for consumers to pick the cheapest days to buy petrol.

Chart 10.25 shows daily average petrol sales (as a percentage of total sales for the period) and average retail petrol prices in Perth for the period 1 February to 31 March 2012. In contrast to Adelaide, the duration of each petrol price cycle was always seven days. The cheapest day was always Wednesday and the most expensive day was always Thursday.

Chart 10.25 Daily average petrol sales volumes and prices, Perth: 1 February to 31 March 2012



Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies

The chart shows that:

- the highest volumes of petrol sold always occurred on the cheapest day of the price cycle (i.e. Wednesday)
- the lowest volume of petrol sold was on Sunday. Higher volumes of petrol were sold on Thursday and Friday, despite average prices on these days being relatively higher than on the weekend
- the predictable nature of price cycles in Perth (combined with elements of the FuelWatch system, such as retail prices being fixed for 24 hours and prices at each site being publicly available on the FuelWatch website) make it easier for consumers to purchase petrol on the cheapest day of the price cycle each week.

10.8 Price cycle increases and public holidays

It is often claimed that retail petrol prices always increase before public holidays. These price increases are not surprising given the regularity of petrol price cycle increases in the five largest cities. It is also often claimed that the price increases before public holidays are always higher than the price cycle increases when there is no public holiday.

The 2011 ACCC petrol monitoring report examined petrol price increases before public holidays in each of the five largest cities for the period January 2007 to June 2011. It found that during this period the average price cycle increase before public holidays was equal to or above the annual average price cycle increase less than half (45 per cent) of the time.¹³⁰

As noted in section 10.3 there are three main influences on the size of price cycle increases: changes in wholesale prices, the extent of discounting before the price cycle increase and the overall price level. These factors are not influenced by the timing of public holidays.

Analysis of price cycle increases has been updated to cover the five and a half year period January 2007 to June 2012. In each of the years 2007 to 2011, and the first half of 2012, the price cycle increase before a public holiday was compared with the relevant yearly average price cycle increase (or half yearly in the case of 2012). The results are shown in table 10.9. Charts showing price cycle increases and public holidays in the five largest cities in 2011–12 are provided in appendix G.

Table 10.9 shows that during this period the price cycle increases before public holidays were equal to or above the yearly average price cycle increase less than half (48 per cent) of the time.¹³¹

Table 10.9 Number (and percentage) of price cycle increases before public holidays for the five largest cities: January 2007 to June 2012

	Total	Greater than or equal to calendar year average	Less than calendar year average	Less than calendar year maximum
Sydney	39	19 (49%)	20 (51%)	39 (100%)
Melbourne	41	17 (41%)	24 (59%)	39 (95%)
Brisbane	42	19 (45%)	23 (55%)	41 (98%)
Adelaide	41	28 (68%)	13 (32%)	39 (95%)
Perth	35	13 (37%)	22 (63%)	34 (97%)
Total	198	96 (48%)	102 (52%)	192 (97%)

Source: ACCC analysis based on Informed Sources data

The table shows that:

- a majority of price cycles before public holidays had smaller price increases than the yearly average price cycle increase
- in Sydney, Melbourne, Brisbane and Perth, price cycle increases before public holidays were below the yearly average price cycle increase more than half of the time

¹³⁰ See ACCC, *Monitoring of the Australian petroleum industry*, December 2011, pp. 225–6.

¹³¹ In the eastern capital cities, a price cycle increase before a public holiday has been defined as having occurred within the week up to and including the day of the public holiday in the years 2007 to 2010, and within two weeks in 2011 and 2012. The methodology was modified this year to reflect the increasing duration of price cycles since late-2010. In Perth, a price cycle increase before a public holiday has been defined as having occurred within two weeks up to and including the day of the public holiday prior to 2009 and within one week subsequently. The price increase before (or on) the New Year's Day public holiday is compared with the average price cycle increase for the previous year. This is because the price increase usually occurs in the last week of the previous year.

- in Adelaide price cycle increases before public holidays were equal to or above the yearly average price cycle increase around two-thirds of the time
- in Melbourne and Adelaide, there were two occasions when the price cycle increase before a public holiday was the highest price cycle increase for the year. In Brisbane and Perth there was one occasion and in Sydney there were none.

The results from this analysis are consistent with the conclusions from previous ACCC monitoring reports and show that there is little evidence to support the claim that price cycle increases before public holidays are always higher than the price cycle increases when there is no public holiday.

10.9 Relationship between changes in wholesale prices and retail prices

The ACCC has noted many times that the main determinant of retail prices in Australia is the international benchmark price of refined petrol, which in Australia's case is the price of Mogas 95. Movements in Mogas 95 prices are first reflected in movements in domestic wholesale prices (i.e. terminal gate prices, or TGPs) and then in retail prices.

There is usually a time lag between changes in TGPs and changes in retail prices; i.e. retailers do not necessarily pass on changes in TGPs straight away. This may reflect the stage in the petrol price cycle when TGPs change, and also that some retail sites may not need to purchase petrol immediately when TGPs change. The ACCC has found that there is generally a lag of five days between changes in TGPs and changes in retail prices.

The relationship between changes in TGPs and changes in retail prices is broadly stable over time. However, in the short term it can vary due to the influence of a number of factors. These include:

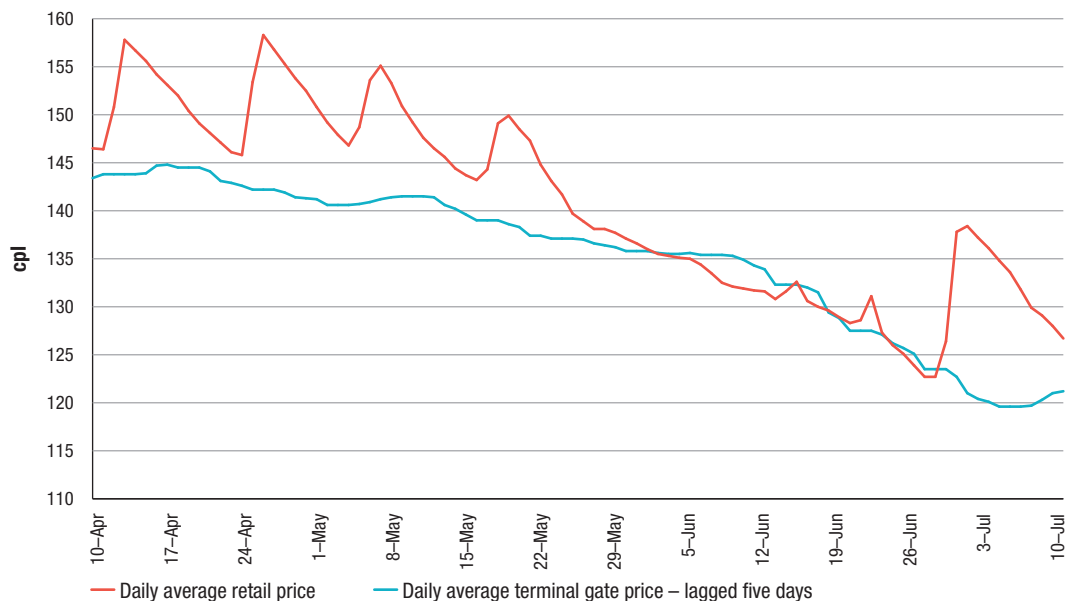
- the extent to which there is extended discounting at the retail level in particular markets
- the magnitude of the change in TGPs.

These factors are considered further below.

10.9.1 Periods of extended discounting

Chart 10.26 shows daily average retail petrol prices in Melbourne for the three month period 10 April to 10 July 2012 and daily average TGPs lagged five days.

Chart 10.26 Daily average retail prices and daily average terminal gate prices lagged five days, Melbourne: 10 April to 10 July 2012



Source: ACCC analysis based on Informed Sources, BP, Caltex, Mobil and Shell data

During this period there were two failed price cycles in Melbourne. As a result of this extended discounting, the decrease in retail prices in Melbourne was greater than the decrease in TGP over that period. Between May and June 2012 monthly average TGPs (lagged by five days) decreased by around 10 cpl whereas monthly average retail prices in Melbourne decreased by around 15 cpl.

This indicates that the state of the market needs to be considered when the relationship between TGPs and retail prices (and gross indicative retail differences—GIRDs—which are the difference between the two series) is being examined.

10.9.2 Magnitude of the change in terminal gate prices

The size of the change in TGPs also appears to be an influence on the relationship between TGPs and retail prices.

The ACCC has analysed monthly changes in TGPs and retail prices in the five largest cities over the four and a half year period from January 2008 to June 2012.¹³² The analysis found that large changes in average monthly TGPs (i.e. changes in TGPs of 5.0 cpl or more per month) led to a less than commensurate change in retail prices. This applied to both increases and decreases in TGPs.

In the 54 months between January 2008 and June 2012 there were 14 months when the change in average monthly TGPs was 5.0 cpl or more. These months are shown in table 10.10, along with the change in retail prices in the month and the difference between the two.

¹³² In the analysis daily average TGPs were lagged by five days and then averaged over the month. Seven-day rolling average retail prices were used (to smooth out the effects of price cycle movements) and averaged over the month.

Table 10.10 Changes in monthly average TGPs equal to or greater than 5.0 cpl, changes in monthly average retail prices and the difference, five largest cities: January 2008 to June 2012

Month	Change in TGPs cpl	Change in retail prices cpl	Difference cpl
May 2008	6.4	4.9	1.5
Jun 2008	9.7	11.3	-1.6
Aug 2008	-12.3	-11.8	-0.5
Nov 2008	-25.4	-25.0	-0.4
Dec 2008	-19.3	-18.9	-0.4
Feb 2009	15.0	13.6	1.4
Mar 2009	-5.0	-3.9	-1.1
Jun 2009	6.3	6.0	0.3
Oct 2009	-6.4	-5.9	-0.5
Dec 2010	5.5	5.0	0.5
Mar 2011	6.9	5.9	1.0
Nov 2011	-6.3	-4.1	-2.2
Mar 2012	5.0	4.7	0.3
Jun 2012	-8.2	-9.2	1.0

Source: ACCC analysis based on Informed Sources, BP, Caltex, Mobil, Shell and WA FuelWatch data

Of the 14 months when monthly average TGPs changed by 5.0 cpl or more:

- there were an equal number of months (seven each) when prices decreased and when prices increased
- there were 12 occasions when the change in monthly average retail prices was smaller than the change in average monthly TGPs. Six of these were when prices increased and six were when prices decreased
- the change in average monthly retail prices in June 2008 (an increase of 11.3 cpl) was greater than the change in average monthly TGPs (an increase of 9.7 cpl). This may have been influenced by price cycle failures in the previous month causing higher than usual increases in retail prices in June 2008
- the change in average monthly retail prices in June 2012 (a decrease of 9.2 cpl) was greater than the change in average monthly TGPs (a decrease of 8.2 cpl). This is likely to have been influenced by the price cycle failures in Melbourne in June 2012.

This analysis suggests that retail prices, in the short run, are slow to reflect large changes in TGPs. This applies equally to increases and decreases. This can have the effect of increasing GIRDs when TGPs decrease by large amounts, and decreasing GIRDs when TGPs increase by large amounts. The analysis highlights the importance of examining changes in GIRDs over a longer time period.