

11 Retail pricing analysis

Key points

- In 2011, petrol price cycles in four of the five largest cities were characterised by considerable variability:
 - the day of the week on which price cycles peaked and troughed moved through the week
 - the duration of price cycles was more often greater than a week.
- Perth was the exception to this pattern—it had stable price cycles, with little variation in the duration of price cycles or the timing of the cycle during the week.
- Petrol prices change infrequently during the day—on average less than twice a day—and the vast majority of price changes are decreases, rather than increases.
- Price cycle increases before public holidays were on average no larger than in other weeks of the year.

11.1 Introduction

Regular price cycles are a prominent feature of petrol prices in Australia's largest cities. Price cycles occur only at the retail level; wholesale prices do not exhibit similar cyclical movements. Price cycles concern some consumers due to the large price increases that occur in a single day, and across most retail sites, on an almost weekly basis.

A petrol price cycle is a movement in price from the trough to a peak to a subsequent trough. A price cycle is considered to have occurred if 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. The price cycle increase is the increase in price from the initial trough to the peak.

Detailed analysis of petrol price cycles was undertaken in previous ACCC monitoring reports. This chapter extends that analysis to the end of September 2011.²⁰⁸ In particular, it considers:

- price cycle increases (that is, the increase in price from trough to peak)
- the days of the week on which prices peak and trough and the duration of price cycles
- the regularity (or otherwise) of price cycles
- movements of prices during the day
- changes in consumer buying patterns during the price cycle
- the size of price cycle increases before public holidays.

²⁰⁸ All references to petrol in this chapter are to regular unleaded petrol (RULP). All references to the year 2011 are to the period 1 January 2011 to 30 September 2011.

11.2 Price cycles in recent years

11.2.1 Price cycles in 2009 and 2010

Price cycles in the five largest cities in 2009 were much more consistent—both in terms of the number of price cycles and their pattern—than in previous or subsequent years. There was only one failed price cycle in 2009 (which was in Brisbane).²⁰⁹ Price cycle troughs generally occurred on Wednesday in all cities except Perth (which was generally on Tuesday) and peaks generally occurred on Friday in all cities except Adelaide (which was generally on Thursday).

In contrast, in 2010 the day of the week on which prices troughed and peaked changed significantly in Sydney, Melbourne, Brisbane and Adelaide. In Perth the day of the week on which prices most commonly peaked was the same as in 2009 (i.e. Friday) but the day of the week on which prices most commonly troughed changed in March 2010 from Tuesday to Wednesday. In addition, there were a significant number of failed and truncated price cycles in 2010.

11.2.2 Price cycles in 2011

In contrast to 2009, when price cycles generally had a duration of seven days, in 2011 price cycles of eight and nine days' duration were increasingly common. As a result, the cheapest and most expensive days to buy petrol changed throughout the week. The exception was Perth, where the pattern of price cycles was fairly consistent and their duration in 2011 was almost always seven days.

Across the five largest cities, there were 15 failed or truncated price cycles in 2011. Of these instances, nine were in Adelaide and three were in Brisbane. There were no failed or truncated price cycles in Perth.

11.3 Data on price cycles

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 cpl is likely to be higher than when prices are around 100 cpl.

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 can vary from the average price cycle increase.

Data on the number of price cycles and average price cycle increases in the five largest cities for the period 1 January 2005 to 30 September 2011 is shown in table 11.1.²¹⁰

²⁰⁹ See section 11.5.1 for definitions of the various types of price cycles.

²¹⁰ 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: in Perth, FuelWatch operates, which prevents intra-day price changes; in Brisbane, prior to July 2009 there was a state subsidy to retail prices of around 9.2 cpl (including GST); and in Sydney, the number of retail sites selling RULP has been declining since October 2007 following the introduction of an ethanol mandate in New South Wales.

Table 11.1 Average price cycle increase in cents per litre and as a percentage of average price, and number of price cycles, in the five largest cities: 2005 to 2011*

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth
Average price cycle increase (cpl)					
2005	7.0	7.1	7.1	7.6	10.8
2006	9.0	9.2	8.2	9.8	7.3
2007	9.4	9.6	8.4	10.3	8.0
2008	10.1	9.9	8.5	11.2	9.1
2009	12.2	11.0	9.3	13.5	7.6
2010	10.2	11.3	9.3	12.9	7.2
2011*	9.2	11.2	8.9	13.7	8.3
Price cycle increase as a percentage of average annual price (%)					
2005	6.3	6.4	6.9	6.7	9.8
2006	7.2	7.3	7.0	7.8	5.9
2007	7.5	7.7	7.1	8.3	6.4
2008	7.1	6.9	6.3	7.9	6.5
2009	10.2	9.1	7.9	11.3	6.5
2010	8.2	9.0	7.3	10.4	5.8
2011*	6.6	8.0	6.3	9.9	5.9
Number of price cycles					
2005	46	28	34	49	6
2006	47	43	45	50	20
2007	44	49	50	45	24
2008	52	48	47	46	11
2009	52	52	51	52	38
2010	45	47	48	49	49
2011*	33	33	31	29	39

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

In 2011, average price cycle increases were smaller compared with 2010 in Sydney, Melbourne and Brisbane, and larger in Adelaide and Perth. In Sydney, the average price cycle increase was the lowest since 2006.

Adelaide had the largest average price cycle increase in 2011 of 13.7 cpl. It has also had the highest average price cycle increase of the five cities each year since 2006. Perth had the lowest average price cycle increases in 2011, at 8.3 cpl. As a percentage of the average price, the average price cycle increase in 2011 was lower in all cities except Perth.

In the 39 weeks of 2011, Perth had a price cycle every week. There were a smaller number of price cycles in the other cities, because of price cycle failures and an increase in the duration of price cycles. The number and classification of price cycles in 2011 by city are analysed further in section 11.5.

Over the period January 2005 to September 2011, all cities except Perth had their highest number of price cycles in 2009 (Sydney also had the equal highest number in 2008). The highest number of price cycles for Perth was in 2010. Between 2005 and 2008, Perth had a significantly lower number of price cycles than the other cities. This was due to a longer average duration of price cycles (of around two weeks compared with one week in the other cities) and periods where price cycles were irregular or absent.

11.4 Recent changes in price cycles

11.4.1 Number of peaks and troughs by day of the week

Prior to 2010, there were long periods when price cycle peaks and troughs generally occurred on the same day each week. Since then, changes in the day of the week on which prices peak and trough have made price cycle movements less predictable for consumers. The converse is true in Perth, where price cycles have become more predictable in 2010 and 2011 than in previous years.

Tables 11.2 to 11.6 show 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 for the period 1 January 2005 to 30 September 2011.

Table 11.2 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, Sydney: 2005 to 2011*

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Trough								
2005	11 (24%)	27 (59%)	6 (13%)	2 (4%)				46
2006	1 (2%)	44 (94%)					2 (4%)	47
2007		43 (98%)			1 (2%)			44
2008		26 (49%)	26 (49%)				1 (2%)	53
2009			52 (100%)					52
2010	1 (2%)	2 (5%)	11 (25%)	10 (23%)	13 (30%)	4 (9%)	3 (7%)	44
2011*	3 (9%)	2 (6%)	3 (9%)	6 (18%)	15 (45%)	1 (3%)	3 (9%)	33
Total	16 (5%)	144 (45%)	98 (31%)	18 (6%)	29 (9%)	5 (2%)	9 (3%)	319
Peak								
2005			4 (9%)	31 (67%)	6 (13%)	3 (7%)	2 (4%)	46
2006			3 (6%)	44 (94%)				47
2007				44 (100%)				44
2008				51 (98%)	1 (2%)			52
2009				12 (23%)	40 (77%)			52
2010	4 (9%)		2 (4%)	1 (2%)	15 (33%)	11 (24%)	12 (27%)	45
2011*	8 (24%)	2 (6%)	1 (3%)	4 (12%)	3 (9%)	5 (15%)	10 (30%)	33
Total	12 (4%)	2 (1%)	10 (3%)	187 (59%)	65 (20%)	19 (6%)	24 (8%)	319

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

Table 11.3 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, Melbourne: 2005 to 2011*

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Trough								
2005	9 (32%)	12 (43%)		6 (21%)			1 (4%)	28
2006	2 (5%)	41 (95%)						43
2007	1 (2%)	47 (96%)	1 (2%)					49
2008		23 (47%)	26 (53%)					49
2009			52 (100%)					52
2010	1 (2%)	3 (7%)	10 (22%)	11 (24%)	15 (33%)	4 (9%)	2 (4%)	46
2011*	4 (12%)	2 (6%)	2 (6%)	5 (15%)	12 (36%)	5 (15%)	3 (9%)	33
Total	17 (6%)	128 (43%)	91 (30%)	22 (7%)	27 (9%)	9 (3%)	6 (2%)	300
Peak								
2005			3 (11%)	16 (57%)		2 (7%)	7 (25%)	28
2006				43 (100%)				43
2007				49 (100%)				49
2008				48 (100%)				48
2009				8 (15%)	44 (85%)			52
2010	3 (6%)	2 (4%)		2 (4%)	16 (34%)	10 (21%)	14 (30%)	47
2011*	5 (15%)	3 (9%)	3 (9%)	3 (9%)	5 (15%)	4 (12%)	10 (30%)	33
Total	8 (3%)	5 (2%)	6 (2%)	169 (56%)	65 (22%)	16 (6%)	31 (10%)	300

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

Table 11.4 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, Brisbane: 2005 to 2011*

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Trough								
2005	5 (15%)	10 (29%)	1 (3%)	11 (32%)	3 (9%)	1 (3%)	3 (9%)	34
2006		42 (93%)	1 (2%)			1 (2%)	1 (2%)	45
2007		43 (86%)	6 (12%)				1 (2%)	50
2008		21 (45%)	26 (55%)					47
2009		1 (2%)	51 (98%)					52
2010	1 (2%)	3 (6%)	11 (23%)	13 (28%)	13 (28%)	4 (9%)	2 (4%)	47
2011*	4 (13%)	4 (13%)	1 (3%)	5 (16%)	13 (42%)	4 (13%)		31
Total	10 (3%)	124 (41%)	97 (33%)	29 (9%)	29 (9%)	10 (3%)	7 (2%)	306
Peak								
2005			1 (3%)	15 (44%)	2 (6%)	6 (18%)	10 (29%)	34
2006				45 (100%)				45
2007				49 (98%)	1 (2%)			50
2008				45 (96%)	2 (4%)			47
2009				3 (6%)	48 (94%)			51
2010	3 (6%)	2 (4%)	1 (2%)	1 (2%)	15 (31%)	11 (23%)	15 (31%)	48
2011*	5 (16%)	3 (10%)	1 (3%)	4 (13%)	4 (13%)	3 (10%)	11 (35%)	31
Total	8 (3%)	5 (2%)	6 (1%)	162 (53%)	72 (23%)	20 (6%)	36 (12%)	306

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

Table 11.5 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, Adelaide: 2005 to 2011*

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Trough								
2005	1 (2%)	14 (29%)	1 (2%)	6 (12%)	27 (55%)		2 (4%)	49
2006	2 (4%)	47 (92%)					2 (5%)	51
2007		41 (93%)	1 (2%)				1 (2%)	44
2008		34 (72%)	12 (26%)				1 (2%)	47
2009		1 (2%)	50 (96%)				1 (2%)	52
2010	1 (2%)	2 (4%)	26 (54%)	7 (15%)	7 (15%)	4 (8%)	1 (2%)	48
2011*	4 (14%)	3 (10%)	3 (10%)	7 (24%)	10 (34%)	1 (3%)	1 (3%)	29
Total	8 (2%)	142 (45%)	93 (29%)	20 (6%)	44 (14%)	5 (2%)	8 (2%)	320
Peak								
2005			1 (2%)	15 (31%)		7 (14%)	26 (53%)	49
2006			1 (2%)	49 (98%)				50
2007				45 (100%)				45
2008				46 (100%)				46
2009				36 (69%)	16 (31%)			52
2010	2 (4%)	3 (6%)	1 (2%)	2 (4%)	27 (55%)	9 (18%)	5 (10%)	49
2011*	1 (3%)		3 (10%)	5 (17%)	1 (3%)	9 (31%)	10 (34%)	29
Total	3 (1%)	3 (1%)	6 (2%)	198 (62%)	44 (14%)	25 (8%)	41 (13%)	320

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

Table 11.6 Number of troughs and peaks (and percentage of annual total) in petrol prices on each day of the week, Perth: 2005 to 2011*

Year	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Total
Trough								
2005	3 (43%)		1 (14%)	1 (14%)			2 (29%)	7
2006	2 (11%)				1 (5%)	4 (21%)	12 (63%)	19
2007	10 (42%)	4 (17%)	1 (4%)	1 (4%)		1 (4%)	7 (29%)	24
2008	4 (36%)	3 (27%)	2 (18%)				2 (18%)	11
2009		34 (87%)	4 (10%)				1 (3%)	39
2010		11 (23%)	37 (77%)					48
2011*			39 (100%)					39
Total	19 (10%)	52 (28%)	84 (45%)	2 (1%)	1 (1%)	5 (3%)	24 (13%)	187
Peak								
2005	1 (17%)	2 (33%)	1 (17%)	2 (33%)				6
2006		1 (5%)	13 (65%)	6 (30%)				20
2007			3 (13%)	8 (33%)	11 (46%)	2 (8%)		24
2008		2 (18%)		2 (18%)	4 (36%)		3 (27%)	11
2009				1 (3%)	33 (87%)	4 (11%)		38
2010				7 (14%)	34 (69%)	8 (16%)		49
2011*				38 (97%)	1 (3%)			39
Total	1 (1%)	5 (3%)	17 (9%)	64 (33%)	83 (45%)	14 (7%)	3 (2%)	187

Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

The tables show that in 2010 there was a significant change in the days of the week on which prices peaked and troughed, as well as the number of days on which a peak or trough occurred.

For example, in 2009 in Sydney all troughs occurred on Wednesday, whereas in 2010 there was at least one trough on each day of the week. The most common day in Sydney for prices to trough changed to Friday. A similar change occurred for peaks in Sydney: in 2009 all peaks in Sydney occurred on either Thursday or Friday; in 2010, apart from Tuesday, there was at least one peak on each day of the week. Friday remained the most common day for prices to peak in Sydney.

Similar changes occurred in Melbourne, Brisbane and Adelaide between 2009 and 2010. However, in Perth there was no change in the day of the week on which prices most commonly peaked and troughed.

In 2011, both troughs and peaks have occurred on every day of the week in Sydney and Melbourne, and on at least six days of the week in Brisbane and Adelaide. In contrast, in Perth peaks have occurred on two days of the week and troughs on only one day of the week.

11.4.2 Changes in days of the week of peaks and troughs

Charts 11.1 to 11.10 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 from 1 July 2009 to 30 September 2011. Each dot in the charts depicts a trough or a peak during the price cycle.

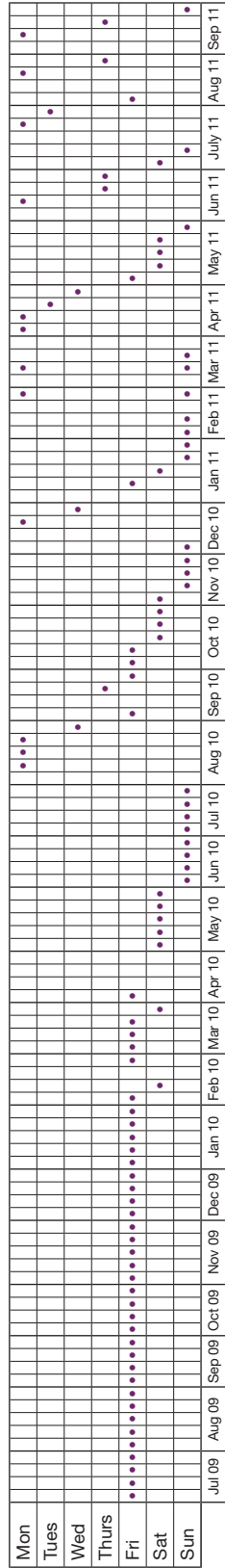
The charts highlight the significant changes in the peak and trough days that have occurred in 2010 and 2011.

From July 2009 to around April 2010, the day of the week on which the peak occurred was generally Friday in Sydney, Melbourne and Brisbane and Thursday or Friday in Adelaide. The day of the week on which the trough occurred in Sydney, Melbourne, Brisbane and Adelaide was almost exclusively Wednesday.

From April–May 2010, the day of the week on which prices peaked and troughed shifted through the week. The movement of peaks and troughs through the week reflects the increase in the duration of price cycles in these cities from seven days to eight or more days.

In Perth, price cycles have been quite stable since regular weekly cycles commenced in March 2009. In 2010, price cycle peaks generally occurred on Friday and troughs on Wednesday. In 2011, every price cycle trough occurred on Wednesday, and all but one price cycle peak occurred on Thursday.

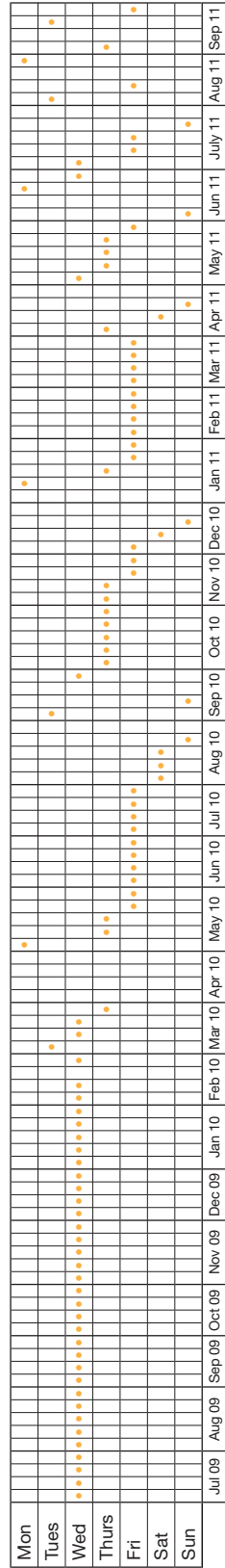
Chart 11.1 Day of peak, Sydney: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one peak in a cycle.

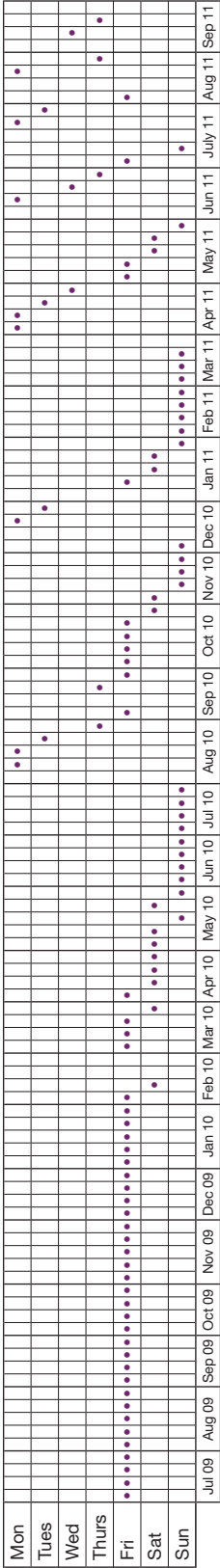
Chart 11.2 Day of trough, Sydney: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one trough in a cycle.

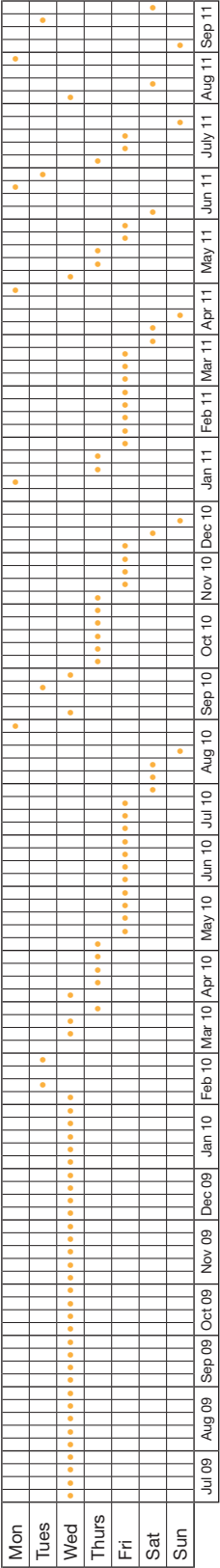
Chart 11.3 Day of peak, Melbourne: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one peak in a cycle.

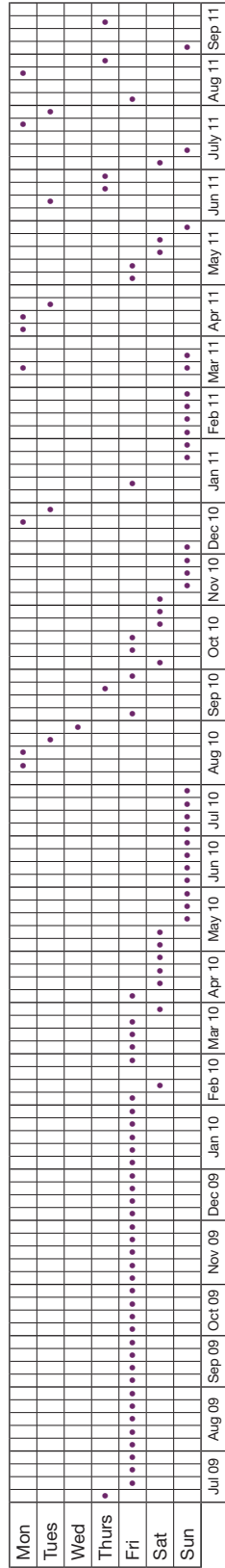
Chart 11.4 Day of trough, Melbourne: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one trough in a cycle.

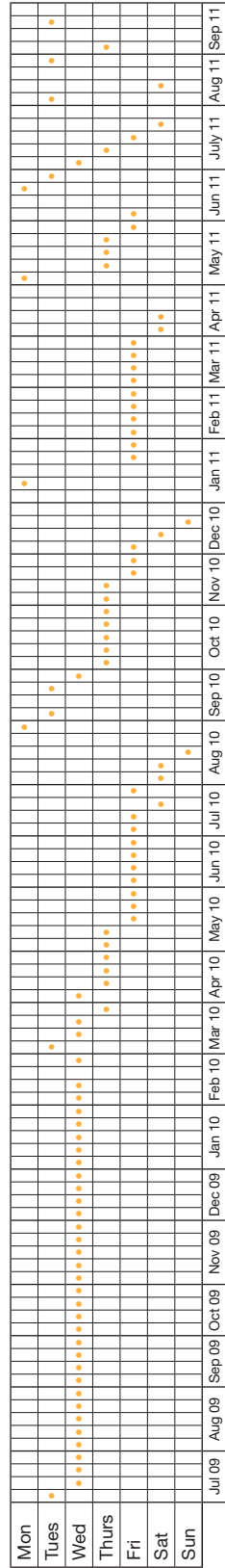
Chart 11.5 Day of peak, Brisbane: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one peak in a cycle.

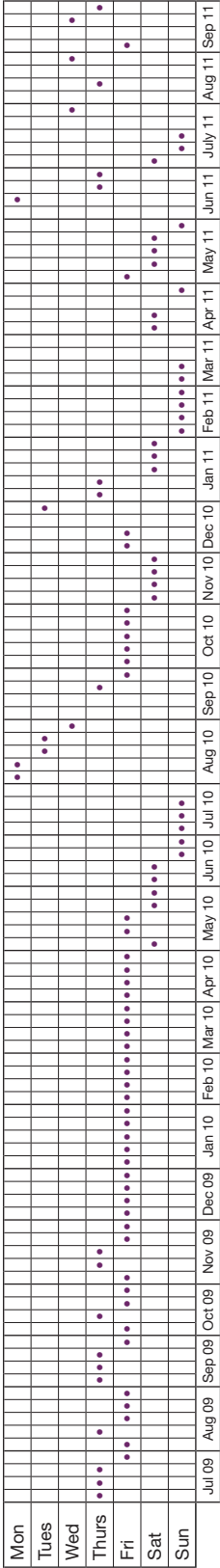
Chart 11.6 Day of trough, Brisbane: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one trough in a cycle.

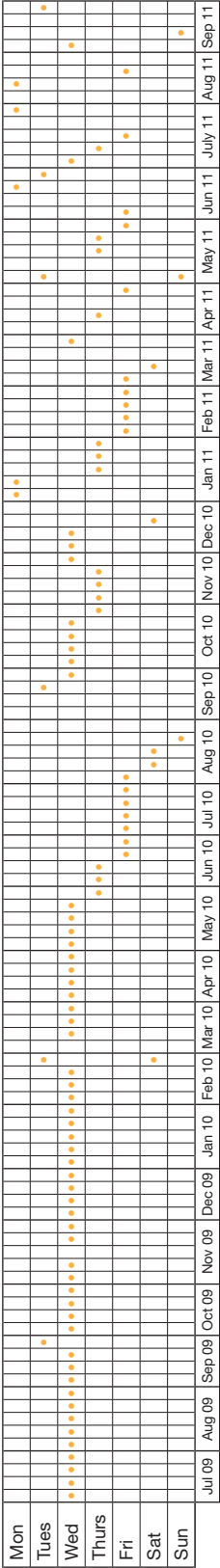
Chart 11.7 Day of peak, Adelaide: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

Note: Each dot depicts one peak in a cycle.

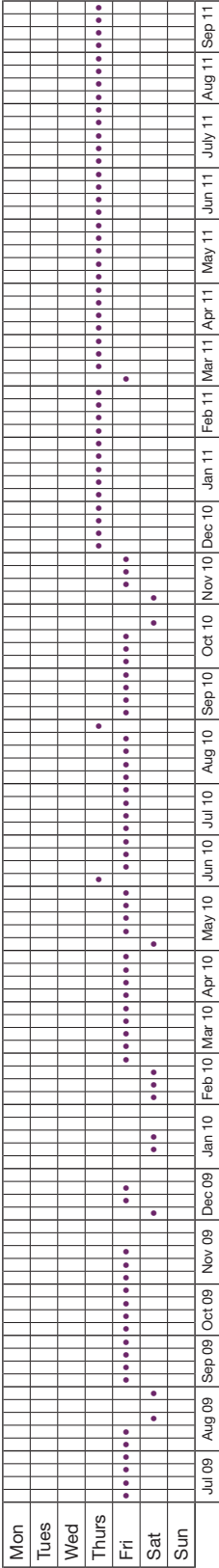
Chart 11.8 Day of trough, Adelaide: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.

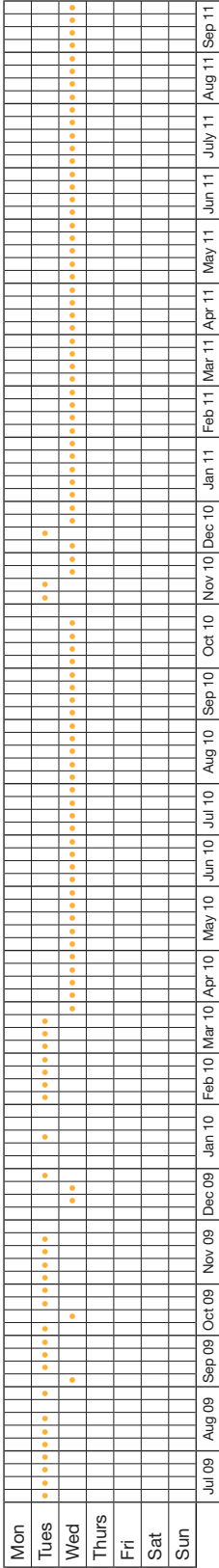
Note: Each dot depicts one trough in a cycle.

Chart 11.9 Day of peak, Perth: 1 July 2009 to 30 September 2011



Source: ACCC analysis based on Informed Sources data.
Note: Each dot depicts one peak in a cycle.

Chart 11.10 Day of trough, Perth: 1 July 2009 to 30 September 2011

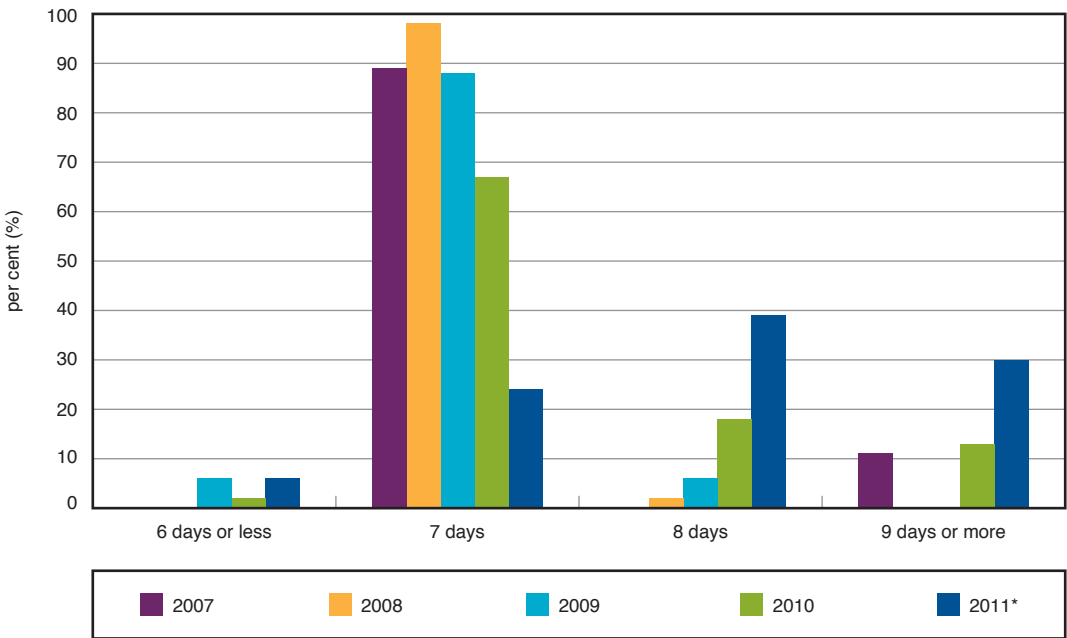


Source: ACCC analysis based on Informed Sources data.
Note: Each dot depicts one trough in a cycle.

11.4.3 Duration of price cycles

Charts 11.11 to 11.15 show the duration of price cycles over the years 2007 to 2011 in each city.

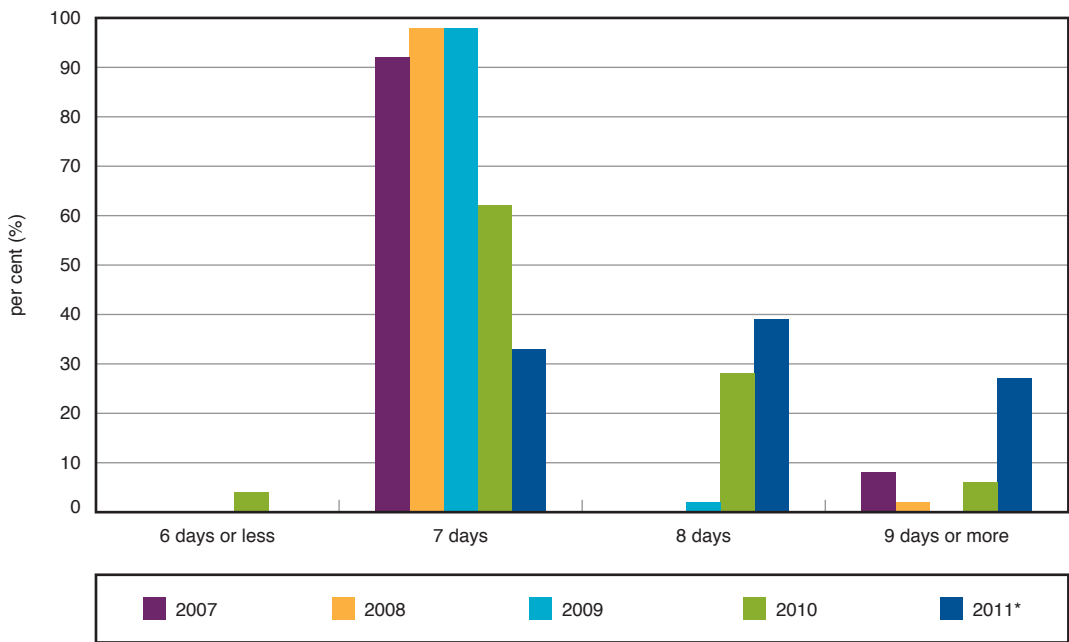
Chart 11.11 Duration of price cycles, Sydney: 2007 to 2011*



Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

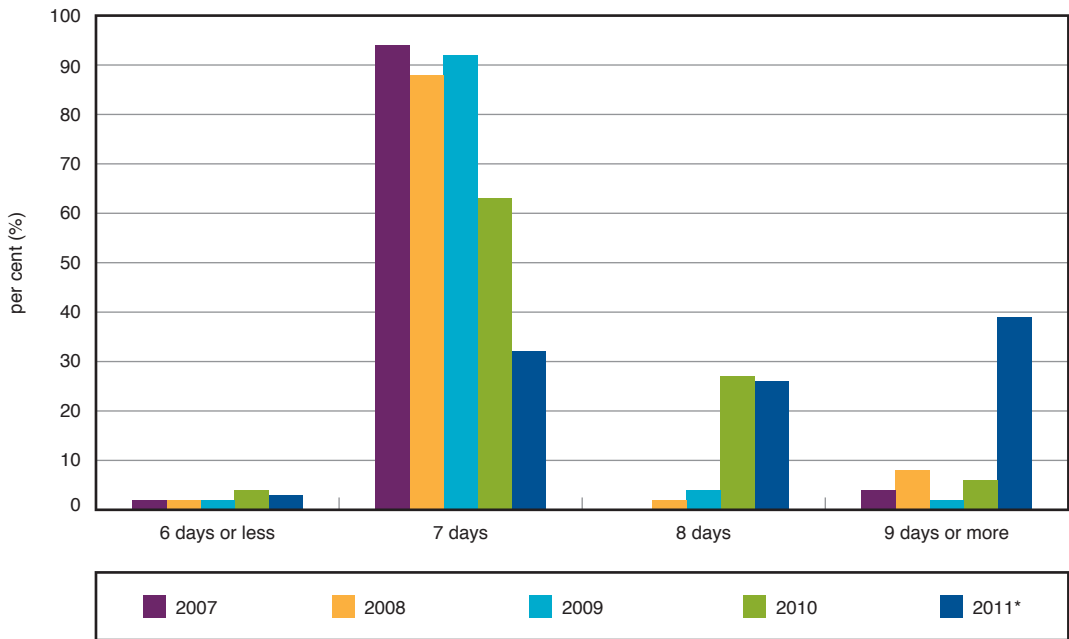
Chart 11.12 Duration of price cycles, Melbourne: 2007 to 2011*



Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

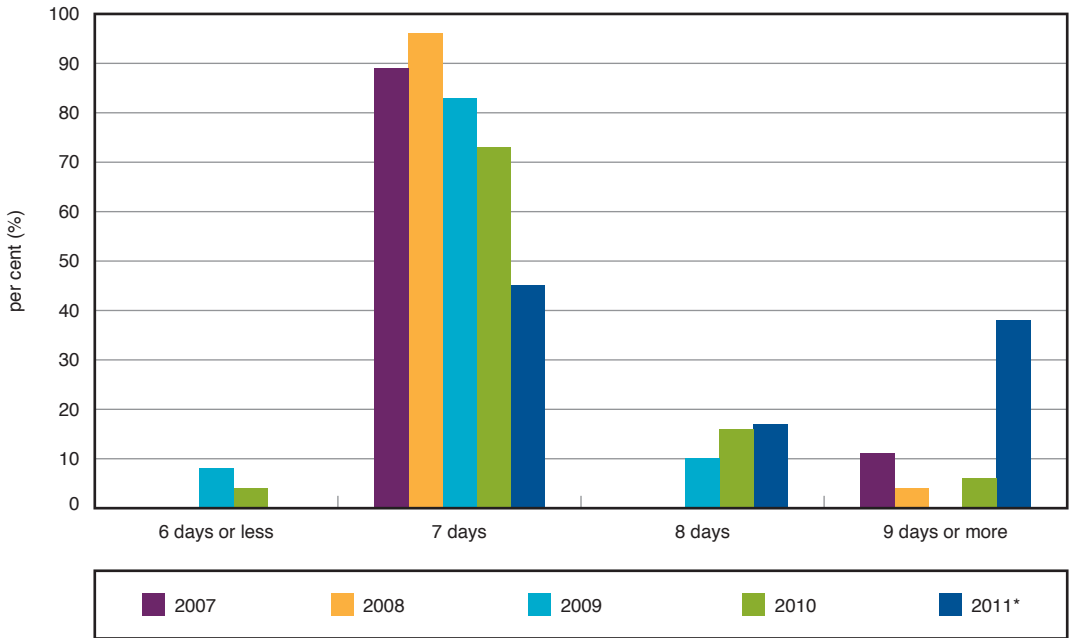
Chart 11.13 Duration of price cycles, Brisbane: 2007 to 2011*



Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

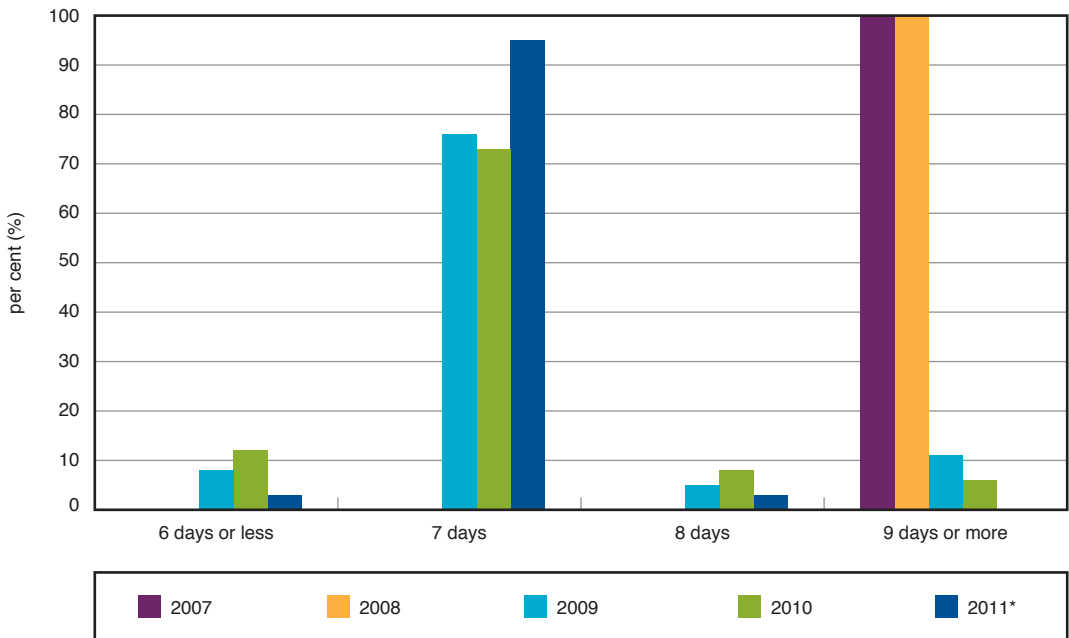
Chart 11.14 Duration of price cycles, Adelaide: 2007 to 2011*



Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

Chart 11.15 Duration of price cycles, Perth: 2007 to 2011*



Source: ACCC analysis based on Informed Sources data.

Note: *Year to 30 September 2011.

The charts show that:

- From 2007 to 2009, on more than 80 per cent of occasions the duration of price cycles in Sydney, Melbourne, Brisbane and Adelaide was seven days.
- Over the last two years, there has been a trend toward price cycles with a duration of more than seven days in Sydney, Melbourne, Brisbane and Adelaide.
- Seven-day price cycles in 2011 occurred less than a third of the time in Sydney, Melbourne and Brisbane. They occurred less than half of the time in Adelaide.
- In contrast, Perth price cycles were always nine days or more in 2007 and 2008.
- Since 2009, price cycles in Perth have been seven days in duration most of the time.

11.5 Regularity of price cycles

The typical pattern of the petrol price cycle in the five largest cities in recent years has been one where prices have risen quickly at the outset (over one to two days) and then steadily declined over the rest of the week; that is, they moved in a 'sawtooth' pattern. This can be considered to be a 'regular' price cycle. The duration of regular price cycles in recent years has generally been a period of around seven days.

There are also a number of price cycles that could be considered to be irregular. These can be classified as 'failed' or 'truncated' price cycles. Price cycles in 2011, as well as in the period 2005 to 2010, have been analysed to determine the extent to which there have been regular, failed and truncated price cycles.

11.5.1 Methodology

Price cycles have been classified into three broad categories:

- **Regular:** this is a price cycle which meets the 3 per cent definition (as discussed in section 11.1), where the peak occurs at a time when an increase would have been expected, and where the regular sawtooth pattern is apparent.
- **Truncated:** this is where the trough to peak increase meets the 3 per cent definition of a price cycle, and where the peak occurs at a time when an increase would 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 increase). Generally, the price cycle increase is significantly less than would be expected.
- **Failed:** this is where there is a small (or no) increase in price, at a time when an increase would have been expected, but the magnitude of the price increase does not meet the 3 per cent definition.

The classification of price cycles has been made on a weekly basis (as defined by Monday to Sunday). This classification tended to work well in the past, when price cycles were generally of seven days duration. However, in 2011 price cycles were generally of a longer duration. This means that there were weeks in which no price cycle peak was recorded but price cycle movements were regular in nature.²¹¹

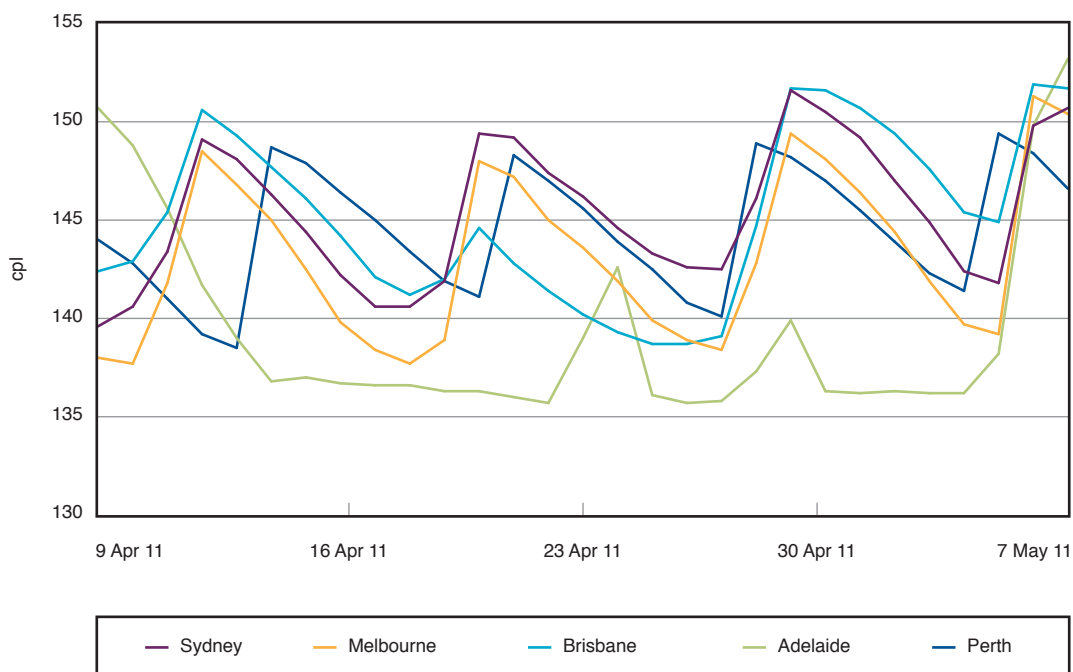
²¹¹ These are denoted by an asterisk in table 11.7.

During regular price cycles, most market participants increase prices within a day or so of each other. Generally, a small number of retailers increase their prices first and the rest of the market follows. Failed and truncated price cycles can occur because some market participants do not increase prices during this time. 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 decrease their prices).

11.5.2 Categories of price cycles

Chart 11.16 shows daily average retail prices in the five largest cities for the period 9 April 2011 to 7 May 2011. There were regular, failed and truncated price cycles during this period.

Chart 11.16 Daily average prices in the five largest cities: 9 April 2011 to 7 May 2011



Source: ACCC based on Informed Sources data.

The chart indicates that:

- Price cycles in Sydney, Melbourne and Perth over this period were consistently regular.
- In Adelaide (the green line in the chart) there was a failed price cycle (around 16 April), followed by a truncated price cycle (around 23 April) and then another failed price cycle (around 30 April).²¹²
- In Brisbane (the light blue line in the chart) there was a failed price cycle (around 20 April) in between two regular price cycles.

²¹² While the third price cycle looks like a truncated price cycle it is actually a failed price cycle because it does not meet the 3 per cent rule discussed in section 11.1.

11.5.3 Classification of price cycles in 2011

Table 11.7 indicates the weekly classification of the price cycle for the 39 weeks in the period 27 December 2010 to 25 September 2011.

Table 11.7 Price cycles in the five largest cities by classification: 27 December 2010 to 25 September 2011

Starting Monday	Ending Sunday	Sydney	Melbourne	Brisbane	Adelaide	Perth
27 Dec	2 Jan	Failed	Failed	Failed	Truncated	Regular
3 Jan	9 Jan	Regular	Regular	Regular	Regular	Regular
10 Jan	16 Jan	Regular	Regular	Failed	Regular	Regular
17 Jan	23 Jan	Regular	Regular	Regular	Regular	Regular
24 Jan	30 Jan	Regular	Regular	Regular	Regular	Regular
31 Jan	6 Feb	Regular	Regular	Regular	Regular	Regular
7 Feb	13 Feb	Regular	Regular	Regular	Regular	Regular
14 Feb	20 Feb	*	Regular	Regular	Regular	Regular
21 Feb	27 Feb	Regular^	Regular	Regular	Regular	Regular
28 Feb	6 Mar	*	Regular	*	Regular	Regular
7 Mar	13 Mar	Regular^	Regular	Regular^	Truncated	Regular
14 Mar	20 Mar	Regular	Regular	Regular	Failed	Regular
21 Mar	27 Mar	*	*	*	Failed	Regular
28 Mar	3 Apr	Regular	Regular	Regular	Regular	Regular
4 Apr	10 Apr	Regular	Regular	Regular	Regular	Regular
11 Apr	17 Apr	Regular	Regular	Regular	Failed	Regular
18 Apr	24 Apr	Regular	Regular	Failed	Truncated	Regular
25 Apr	1 May	Regular	Regular	Regular	Failed	Regular
2 May	8 May	Regular	Regular	Regular	Regular	Regular
9 May	15 May	Regular	Regular	Regular	Regular	Regular
16 May	22 May	Regular	Regular	Regular	Regular	Regular
23 May	29 May	Regular	Regular	Regular	Regular	Regular
30 May	5 Jun	*	*	*	*	Regular
6 Jun	12 Jun	Truncated	Regular	Regular	Regular	Regular
13 Jun	19 Jun	Regular	Regular	Regular	Regular	Regular
20 Jun	26 Jun	Regular	Regular	Regular	Regular	Regular
27 Jun	3 Jul	Regular	Regular	Regular	Regular	Regular
4 Jul	10 Jul	Regular	Regular	Regular	Regular	Regular
11 Jul	17 Jul	*	*	*	Regular	Regular
18 Jul	24 Jul	Regular	Regular	Regular	*	Regular
25 Jul	31 Jul	Regular	Regular	Regular	Regular	Regular
1 Aug	7 Aug	Regular	Regular	Regular	Failed	Regular
8 Aug	14 Aug	*	*	*	Regular	Regular
15 Aug	21 Aug	Regular	Regular	Regular	Failed	Regular
22 Aug	28 Aug	Regular	Regular	Regular	Regular	Regular
29 Aug	4 Sep	*	*	Regular	Regular	Regular
5 Sep	11 Sep	Regular	Regular	*	*	Regular
12 Sep	18 Sep	Regular	Regular	Regular	Regular	Regular
19 Sep	25 Sep	Regular	*	*	Regular	Regular

Source: ACCC analysis based on Informed Sources data.

Notes: * Denotes where there was no price cycle peak in the specified week. These occasions are associated with price cycles of durations longer than seven days.

^ Denotes where there were two price cycle peaks in the specified week. These occasions are associated with price cycles of durations less than seven days.

Table 11.7 shows that over the 39 weeks in 2011 to Sunday, 25 September:

- There were 11 failed price cycles:
 - Adelaide had six failed cycles, Brisbane had three, and Sydney and Melbourne had one each.
 - In the first week of 2011, the price cycle failed in Sydney, Melbourne and Brisbane.
- There were four truncated price cycles: three were in Adelaide and one was in Sydney.
- Altogether there were a total of 15 failed and truncated price cycles in the five largest cities (nine of which occurred in Adelaide).
- Perth had regular price cycles every week during the period.

The occasions in the second half of 2010 and the first half of 2011 when failed and truncated price cycles occurred in Sydney, Melbourne, Brisbane and Adelaide can be seen in the charts at appendix I.

11.5.4 Classification of price cycles in 2005–10

Petrol price cycles in Sydney, Melbourne, Brisbane and Adelaide over the period 2005 to 2010 were examined in order to provide a historical context for the failed and truncated price cycles in 2011. The analysis covered a total of 1248 weeks across the four cities over the six years. Price cycles in Perth were not included in the analysis as they were not as regular, or as frequent, as those in the other cities for much of this period (this can be seen in table 11.1 in section 11.3).

Table 11.8 indicates the number of failed and truncated price cycles in each of the cities for each year from 2005 to 2010.

Table 11.8 Failed and truncated price cycles in Sydney, Melbourne, Brisbane and Adelaide: 2005 to 2010

	Sydney	Melbourne	Brisbane	Adelaide	Total
Failed price cycles					
2005	6	24	18	3	51
2006	5	9	7	2	23
2007	8	3	2	7	20
2008	–	4	5	6	15
2009	–	–	1	–	1
2010	5	3	2	2	12
Total	24	43	35	20	122
Truncated price cycles					
2005				1	1
2006	1	–	–	3	4
2007	–	–	1	1	2
2008	1	–	1	1	3
2009	–	–	–	3	3
2010	5	2	3	6	16
Total	7	2	5	15	29
Failed and truncated cycles					
2005	6	24	18	4	52
2006	6	9	7	5	27
2007	8	3	3	8	22
2008	1	4	6	7	18
2009	–	–	1	3	4
2010	10	5	5	8	28
Total	31	45	40	35	151

Source: ACCC analysis based on Informed Sources data.

Table 11.8 shows that from 2005 to 2010 there were 122 failed price cycles and 29 truncated price cycles, representing 12 per cent of the total weeks in that time. This indicates that for 88 per cent of the weeks during the six year period, price cycles were classified as regular.

Failed price cycles

Failed price cycles occurred simultaneously in all four cities on four occasions; in three cities on five occasions; and in two cities on 19 occasions. There were 53 occasions when a failed price cycle occurred in only one city.

The four occasions when failed price cycles occurred simultaneously in all four cities were the weeks beginning 29 August 2005, 15 January 2007, 10 September 2007 and 6 September 2010. It is not always apparent why the price cycle failed in all four cities simultaneously. However, the occurrence in 2005 is likely to have been associated with the steep increase in wholesale and retail prices as a result of Hurricane Katrina.

Failed price cycles occurred most frequently in 2005, with 51 failed price cycles (42 per cent of the total). The frequency of failed price cycles steadily diminished each year to only one in 2009. However, in 2010 there were 12 failed price cycles.

Truncated price cycles

There were 29 truncated price cycles identified over the six-year period. Sixteen truncated cycles occurred in 2010, including six in Adelaide and five in Sydney.

In 2010, truncated price cycles occurred simultaneously in all four cities in the week beginning 25 January 2010, in three cities in the week beginning 1 February 2010, and in two cities in the week beginning 22 February 2010. Prior to 2010, there was only one other occasion when truncated price cycles occurred in more than one city at the same time.

Price cycles in Perth

Prior to May 2008, Perth had regular price cycles with an average duration of around two weeks, compared with an average of around one week in the other four largest cities. Price cycles thereafter were very irregular until March 2009, since when they have been regular with an average duration of around seven days.

From March 2009, Perth had eight failed price cycles: four each in 2009 and 2010. The only truncated cycle was in the week beginning 14 December 2009, which immediately preceded two consecutive failed cycles.

11.6 Movement of prices during the day

Petrol price changes during the day are an issue of concern for motorists.²¹³ This section analyses the frequency of petrol price changes within a day and the size of petrol price changes. As most retail sites are open for 24 hours, this analysis records data on prices and price changes between midnight and 11.59 pm each day. It examines prices in Sydney, Melbourne, Brisbane and Adelaide over the period 1 July 2004 to 30 June 2011.

Perth was not included in the analysis because the FuelWatch arrangements in Western Australia require that retail prices are fixed for 24 hours from 6.00 am each day. Therefore, prices in Perth can only change once per day.

This analysis was undertaken by Informed Sources for the ACCC and is based on electronically collected data from the major petrol retailers.²¹⁴ Some caveats on the results include:

- As not all retailers are subscribers to Informed Sources the analysis covers most, but not all, retail sites in each city.
- These are average results across the retail sites in each city. Therefore, they may not represent the results at any specific retail site.
- A degree of caution is required when considering the results for Sydney because the number of retail sites selling RULP has decreased substantially over the period. This is primarily due to the ethanol mandate in NSW, which has led to retail sites selling E10 petrol and ceasing to sell RULP.

11.6.1 Frequency of price changes per day

The frequency of price changes within a day was assessed using two indicators: the average number of price changes per day, and the average price duration per day.

Average number of price changes per day

The average number of changes per day was derived by counting the number of changes in a day at each site and averaging across all the retail sites in a city each year.

Table 11.9 shows the average number of price changes per day in each year (and half years in the case of 2004 and 2011) in each city.

213 See the summary of the ANOP consumer survey in November 2007 commissioned by the ACCC and included in appendix H of the 2007 ACCC petrol inquiry report.

214 This analysis is based on price data from BP, Caltex, Mobil, Coles Express, Woolworths, 7-Eleven, and On The Run. Some methodological issues are noted below.

Informed Sources collects price data electronically from its subscribers, which enables the collection of price changes throughout the day. However, the data is subject to distortions that can occur as the result of operators misusing the system. In particular, there are cases where console operators have made one-off changes to their price in order to allow a fuel customer to make incidental purchases (e.g. cigarettes) on a company petrol card.

These rapid, short duration changes can significantly bias the results of any analysis of change frequency (although they have little impact on average price). For the purposes of this analysis Informed Sources filtered out all changes that had a duration of less than an hour.

The manual overrides of prices by operators can also lead to unrealistically high or low prices, and although these have little impact on the average prices, they can significantly impact on assessment of price ranges. Therefore, the top and bottom 0.5% of prices in each city and year have been excluded from the analysis.

Table 11.9 Average number of price changes per day—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide	Brisbane	Melbourne	Sydney	Four-city average
H2-2004	1.2	1.4	1.1	1.2	1.2
2005	1.5	1.3	1.2	1.3	1.3
2006	1.5	1.4	1.6	1.3	1.4
2007	1.4	1.4	1.6	1.3	1.4
2008	1.6	1.2	1.6	1.3	1.4
2009	1.9	1.4	1.9	1.4	1.7
2010	1.7	1.2	1.6	1.1	1.4
H1-2011	1.6	1.1	1.7	1.1	1.5
Average	1.6	1.3	1.6	1.3	1.4

Source: Informed Sources.

Table 11.9 shows that over the period July 2004 to June 2011, on average petrol prices changed less than twice a day. They changed most in Melbourne and Adelaide (on average 1.6 times per day) and least in Sydney and Brisbane (on average 1.3 times per day).

Table 11.9 also indicates that:

- The average number of price changes across all four cities ranged from a low of 1.2 times per day in the second half of 2004 to a high of 1.7 times per day in 2009.
- On an individual city basis, the highest number of changes per day (1.9 times) occurred in Adelaide and Melbourne in 2009 and the lowest number of changes per day (1.1 times) occurred in Sydney in 2010 and the first half of 2011, in Melbourne in the second half of 2004 and in Brisbane in the first half of 2011.

While the table shows the average number of price changes per day in each city in each year, the actual number of price changes per day at individual retail sites ranged from no changes per day to more than 10 changes per day. However, the number of retail sites with a high number of price changes was so small as to be relatively insignificant. Over the period July 2004 to June 2011, 96 per cent of the total number of price changes per day at each retail site ranged between no price changes to three price changes per day.

Average price duration per day

The average price duration was calculated by finding the average duration of all the price changes at a retail site on a given day (in hours), and averaging this across all the retail sites in a city. By taking an average of retail site averages (rather than an average of all changes), equal weight was given to each retail site.

Table 11.10 shows the average price duration per day for each year (and half years in the case of 2004 and 2011) in each city.

Table 11.10 Average price duration per day (in hours)—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide	Brisbane	Melbourne	Sydney	Four-city average
H2-2004	14.1	13.0	15.0	13.8	14.0
2005	12.1	13.9	13.7	13.5	13.5
2006	12.4	13.0	11.5	12.8	12.4
2007	12.3	12.5	10.9	12.9	12.1
2008	11.6	13.3	11.0	12.8	12.1
2009	10.0	12.4	9.5	12.0	10.9
2010	11.3	13.3	11.0	15.1	12.4
H1-2011	12.0	13.6	10.1	13.6	11.9
Average	11.8	13.1	11.3	13.1	12.3

Source: Informed Sources.

Over the period July 2004 to June 2011, the average petrol price duration per day was 12.3 hours. The duration was shortest in Melbourne (on average 11.3 hours per day) and longest in Sydney and Brisbane (on average 13.1 hours per day).

Table 11.10 also shows that:

- The average price duration across all four cities was shortest in 2009 (10.9 hours per day) and longest in the second half of 2004 (14.0 hours per day).
- On an individual city basis, the shortest price duration occurred in Melbourne (9.5 hours per day) in 2009 and the longest occurred in Sydney (15.1 hours per day) in 2010.
- Over time, the average price duration per day in Adelaide and Melbourne has tended to decline, whereas in Sydney and Brisbane it has tended to be more stable.

There is a relationship between the number of price changes per day and the average duration of price changes per day. In Melbourne petrol prices change more frequently per day and therefore the average price duration per day is shorter. Conversely, in Sydney, there are fewer price changes per day and therefore the average price duration is longer.

11.6.2 Size of price changes

To assess the size of price changes, a number of indicators were used:

- Price decreases as a percentage of total price changes, and the average price decrease.
- Price increases as a percentage of total price changes, and the average price increase.²¹⁵

Price decreases

Table 11.11 shows the percentage of price changes that were price decreases in each year (and half years in the case of 2004 and 2011) in each city. It clearly indicates that the vast majority of petrol price changes were price decreases.

²¹⁵ When comparing prices and price changes across cities it is important to remember the caveat on Sydney prices noted earlier, and that the magnitude of price changes in Brisbane may have been influenced by the Queensland Government retail subsidy (of around 9.2 cpl including the GST) which applied prior to July 2009.

Table 11.11 Percentage of price changes that were price decreases—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide %	Brisbane %	Melbourne %	Sydney %	Four-city average %
H2-2004	76.6	79.4	76.1	76.1	77.0
2005	81.5	76.4	79.8	76.8	78.3
2006	85.2	83.9	87.7	83.6	85.3
2007	85.9	85.8	88.9	85.3	86.9
2008	86.6	82.9	88.3	84.3	85.8
2009	90.2	85.4	91.0	87.1	88.8
2010	88.8	83.4	89.2	83.4	87.0
H1-2011	88.3	83.3	90.1	84.0	87.6
Average	86.3	82.9	87.8	82.9	85.2

Source: Informed Sources.

Table 11.11 shows that:

- Over the period July 2004 to June 2011, the average percentage of price decreases across all four cities was around 85 per cent.
 - It was highest in Melbourne (on average around 88 per cent) and lowest in Brisbane and Sydney (on average around 83 per cent).
- The average percentage of price decreases across all four cities ranged from a high of around 89 per cent in 2009 to a low of 77 per cent in the second half of 2004.

Table 11.12 shows the average price decrease in each year (and half years in the case of 2004 and 2011) in each city.

Table 11.12 Average price decrease—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide cpl	Brisbane cpl	Melbourne cpl	Sydney cpl	Four-city average cpl
H2-2004	1.8	2.3	1.8	2.0	2.0
2005	1.6	2.1	1.4	2.0	1.8
2006	1.7	1.8	1.4	1.9	1.7
2007	1.7	1.5	1.3	1.8	1.5
2008	1.8	1.8	1.4	2.1	1.7
2009	1.5	1.6	1.3	2.1	1.6
2010	1.8	1.9	1.6	2.5	1.8
H1-2011	1.6	1.6	1.3	2.0	1.5
Average	1.7	1.8	1.4	2.0	1.7

Source: Informed Sources.

Over the period July 2004 to June 2011, the average price decrease across all four cities was 1.7 cpl. It was highest in Sydney (2.0 cpl) and lowest in Melbourne (1.4 cpl). It was broadly similar in Brisbane and Adelaide (1.8 cpl and 1.7 cpl respectively).

Table 11.12 also indicates that:

- The average price decrease across all four cities ranged from a high of 2.0 cpl in the second half of 2004 to a low of 1.5 cpl in 2007 and the first half of 2011.
- The largest average price decrease was in Sydney in 2010 (2.5 cpl) and the smallest average price decrease was in Melbourne (1.3 cpl) in 2007, 2009 and the first half of 2011.

Price increases

Table 11.13 shows the percentage of price changes that were price increases in each year (and half years in the case of 2004 and 2011) in each city. It clearly shows that, on average over the period, less than one in six price changes were price increases.

Table 11.13 Percentage of price changes that were price increases—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide %	Brisbane %	Melbourne %	Sydney %	Four-city average %
H2-2004	23.4	20.6	23.9	23.9	23.0
2005	18.5	23.6	20.2	23.2	21.7
2006	14.8	16.1	12.3	16.4	14.7
2007	14.1	14.2	11.1	14.7	13.1
2008	13.4	17.1	11.7	15.7	14.2
2009	9.8	14.6	9.0	12.9	11.2
2010	11.2	16.6	10.8	16.6	13.0
H1-2011	11.7	16.7	9.9	16.0	12.4
Average	13.7	17.1	12.2	17.1	14.8

Source: Informed Sources.

Table 11.13 shows that:

- Over the period July 2004 to June 2011, the average percentage of price increases across all four cities was around 15 per cent.
 - It was highest in Brisbane and Sydney (on average around 17 per cent) and lowest in Melbourne (on average around 12 per cent).
- The average percentage of price increases across all four cities ranged from a low of around 11 per cent in 2009 to a high of 23 per cent in the second half of 2004.
- The highest percentage of price increases was in Sydney and Melbourne in the second half of 2004 (around 24 per cent).
- The lowest percentage of positive price changes was in Melbourne in 2009 (9 per cent).

Table 11.14 shows the average price increase in each year (and half years in the case of 2004 and 2011) in each city.

Table 11.14 Average price increase—Adelaide, Brisbane, Melbourne and Sydney: July 2004 to June 2011

Year	Adelaide cpl	Brisbane cpl	Melbourne cpl	Sydney cpl	Four-city average cpl
H2-2004	5.5	8.0	5.5	6.4	6.4
2005	6.7	6.8	5.6	6.8	6.4
2006	9.3	9.1	9.4	9.7	9.4
2007	9.8	9.2	10.3	10.2	9.9
2008	10.0	8.3	9.7	10.5	9.6
2009	13.2	9.6	12.2	13.9	12.1
2010	12.4	9.0	11.5	11.6	11.0
H1-2011	11.0	7.6	11.0	10.3	9.9
Average	9.8	8.5	9.5	9.6	9.3

Source: Informed Sources.

Table 11.14 shows that over the period July 2004 to June 2011, the average price increase across all four cities was 9.3 cpl. It was highest in Adelaide (9.8 cpl) and lowest in Brisbane (8.5 cpl).

The table also indicates that:

- The average price increase across all four cities ranged from a high of 12.1 cpl in 2009 to a low of 6.4 cpl in the second half of 2004 and 2005.
- The highest average price increase was in Sydney in 2009 (13.9 cpl) and the lowest average price increase was in Adelaide and Melbourne (5.5 cpl) in the second half of 2004.

The data in this section confirms the regular sawtooth pattern of petrol price changes, with large increases followed by smaller more frequent decreases.

11.7 Consumer buying patterns during the price cycle

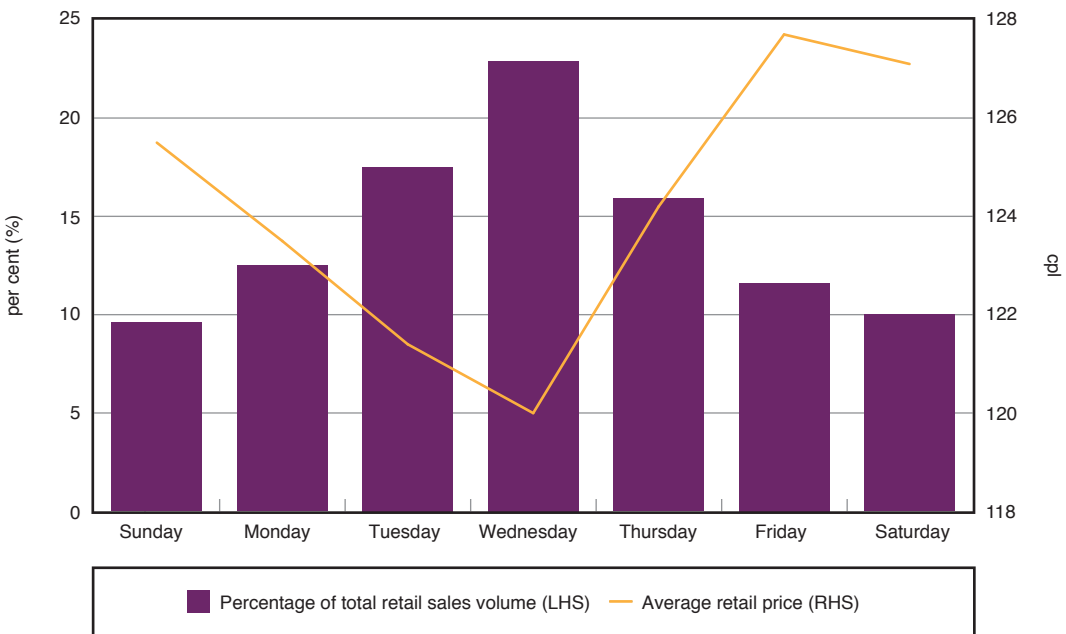
This section provides information on the volume of retail petrol sales and the average price of petrol by day of the week in the five largest cities in 2009–10 and 2010–11.²¹⁶

11.7.1 Consumer buying patterns in 2009–10

In 2009–10, the day of the week on which the price cycle peak occurred was generally Thursday or Friday in Adelaide, and Friday in the other cities. The day of the week on which the price cycle trough occurred in Sydney, Melbourne, Brisbane and Adelaide was almost exclusively Wednesday, and in Perth it was Tuesday and Wednesday.

Chart 11.17 shows the percentage of average sales volumes and average retail petrol prices by day of the week in 2009–10 in the five largest cities. Almost one quarter (23 per cent) of the total volume of retail petrol sales across the five largest cities was sold on Wednesday, when average retail prices were at their lowest. The lowest percentage was sold on Saturday and Sunday (with around 10 per cent each) when average retail prices were relatively high. The most expensive day to buy petrol was Friday.

Chart 11.17 Average petrol sales volumes and prices by day of the week, five largest cities: 2009–10



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

²¹⁶ The analysis in this section examines volumes and prices in the five largest cities only. It is therefore not comparable with information on consumer buying patterns during the price cycle in the 2009 and 2010 ACCC petrol monitoring reports which provided data on national sales volumes.

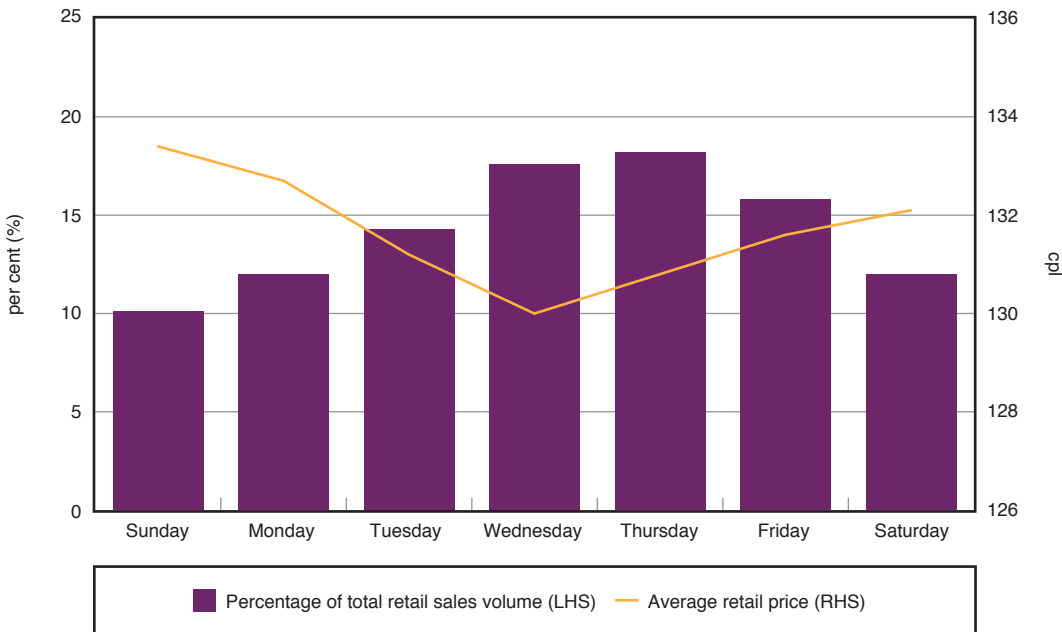
11.7.2 Consumer buying patterns in 2010–11

Chart 11.18 shows the percentage of average sales volumes and average retail petrol prices by day of the week in 2010–11 in the five largest cities. The chart shows that compared with 2009–10 there was a smaller variation in average retail prices from day to day over the week, as well as a more uniform pattern of sales volumes.

This reflects the fact that compared with 2009–10, in 2010–11 in most cities:

- there were more price cycles with durations of more than seven days
- there were more days of the week on which price cycles peaked and troughed.

Chart 11.18 Average petrol sales volumes and prices by day of the week, five largest cities: 2010–11



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

The chart shows that in 2010–11 there was still an inverse relationship between average retail petrol price levels and retail sales volumes, but the relationship was less pronounced than in 2009–10. This suggests that, despite changes in the duration of price cycles in 2010–11, consumers still tended to buy a greater volume of petrol when prices were at or near the price cycle trough. As with 2009–10, the lowest volume was sold on Sunday, which was also the most expensive day to buy petrol in 2010–11.

Similar charts for 2007–08 and 2008–09 are provided in appendix J.

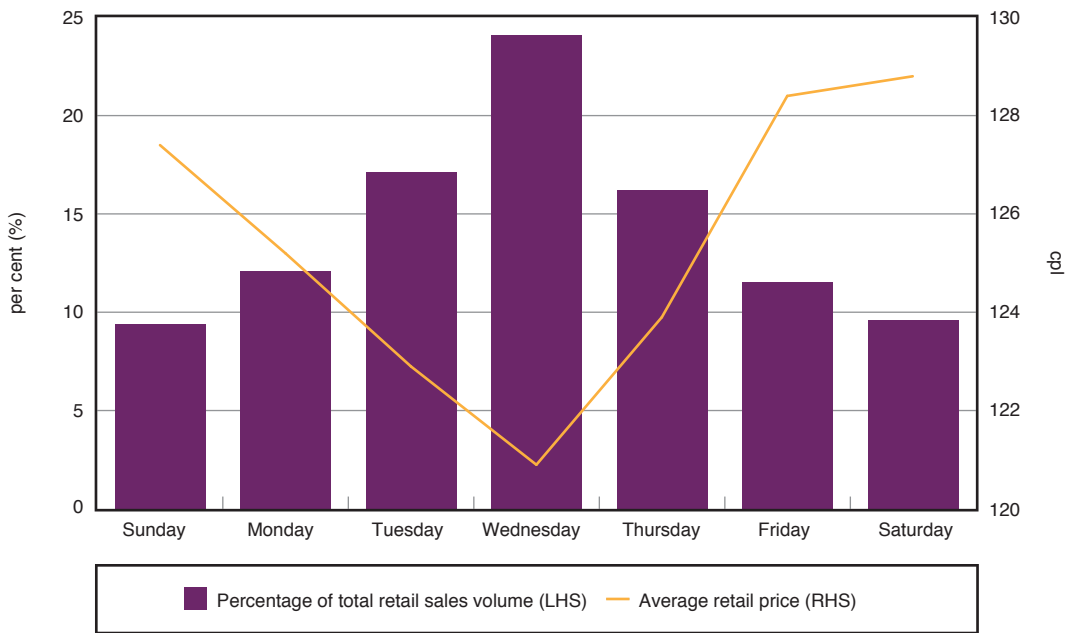
11.7.3 Consumer buying patterns in Melbourne and Perth in 2010–11

The changes in the price cycles in 2010–11 mentioned in section 11.7.2 occurred in Sydney, Melbourne, Brisbane and Adelaide but not in Perth. In Perth, price cycles have shown a more consistent weekly pattern in 2010–11 than in previous years, with the price cycle peak and trough generally occurring on the same day from week to week.

To illustrate the difference between Perth and the other largest cities, charts 11.19 and 11.20 show the percentage of average sales volumes and average retail petrol prices by day of the week in 2009–10 and 2010–11 in Melbourne and charts 11.21 and 11.22 show the same information for Perth.

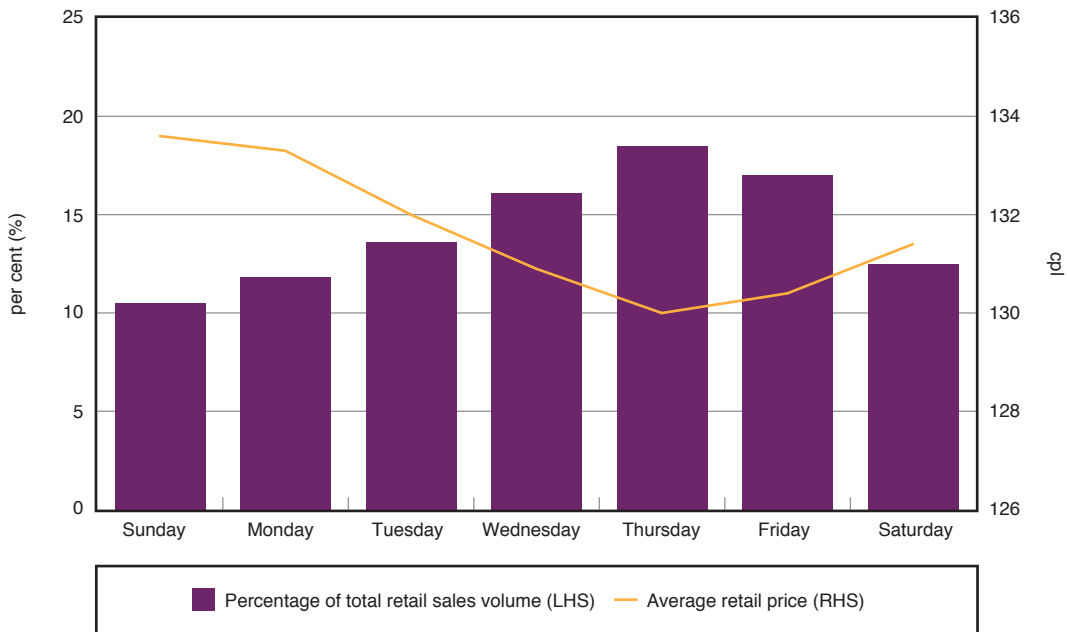
Appendix J provides similar charts for Sydney, Brisbane and Adelaide.

Chart 11.19 Average petrol sales volumes and prices by day of the week, Melbourne: 2009–10



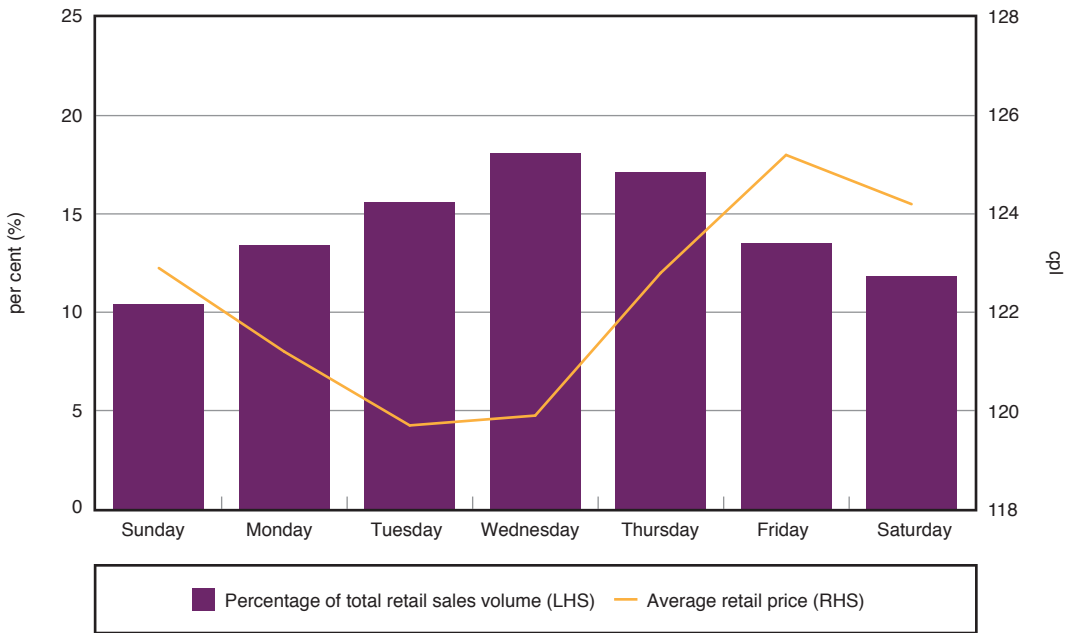
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies.

Chart 11.20 Average petrol sales volumes and prices by day of the week, Melbourne: 2010–11.



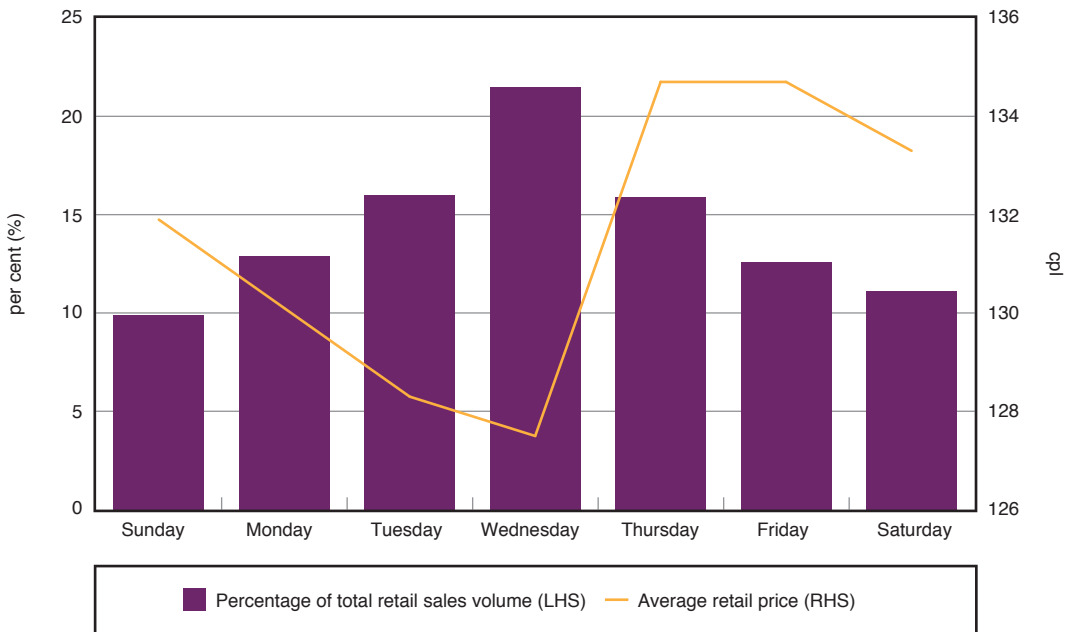
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies.

Chart 11.21 Average petrol sales volumes and prices by day of the week, Perth: 2009–10.



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

Chart 11.22 Average petrol sales volumes and prices by day of the week, Perth: 2010–11.



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

The charts show that:

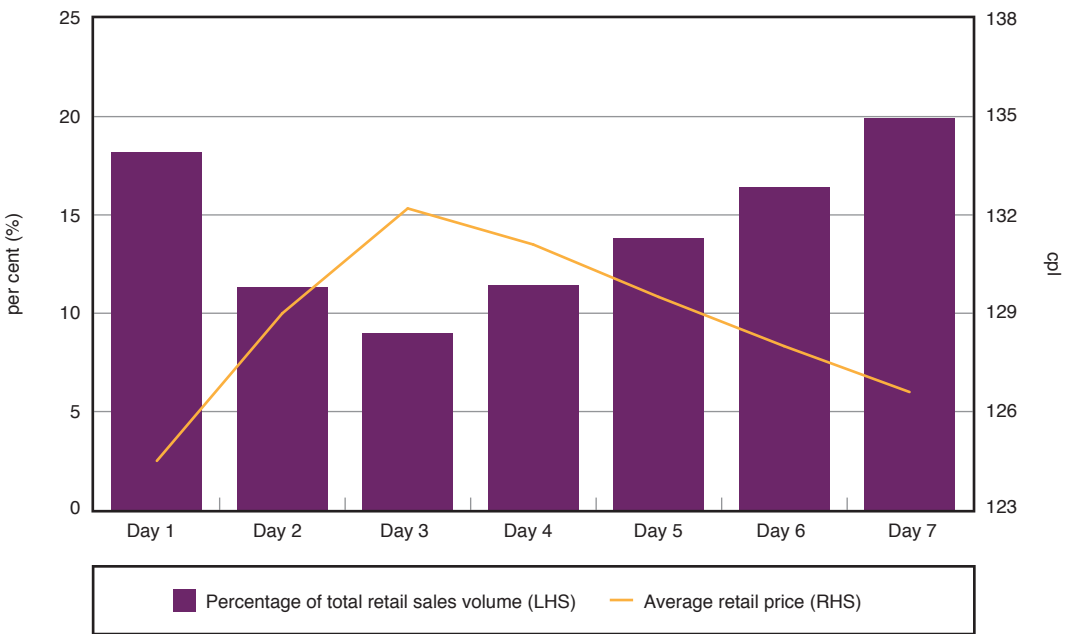
- In Melbourne in 2009–10:
 - The range in average retail price between the cheapest day of the week (Wednesday) and the most expensive (Saturday) was 7.9 cpl.
 - Almost a quarter of petrol volumes (24 per cent) were sold on the cheapest day.
 - There was a strong inverse relationship between the volume of petrol sold and the price of petrol.
- In Melbourne in 2010–11:
 - The range in average retail price between the cheapest day of the week (Thursday) and the most expensive (Sunday) was only 3.6 cpl.
 - The volume of petrol sold was more evenly distributed over the week compared with 2009–10; however, in aggregate, consumers bought more petrol on the cheaper days and less petrol on the more expensive days.
- In Perth in 2009–10:
 - The range in average retail price between the cheapest day of the week (Tuesday) and the most expensive (Friday) was 5.5 cpl.
 - There was broadly an inverse relationship between the volume of petrol sold and the price of petrol; however, more petrol was sold on Wednesday and Thursday than on the cheapest day. Likewise, less petrol was sold on Saturday and Sunday than on the most expensive day.
- In Perth in 2010–11:
 - The range in average retail price between the cheapest day of the week (Wednesday) and the most expensive (Thursday and Friday) increased to 7.2 cpl. Likewise, there was a greater variation in the volume of petrol sold throughout the week compared with 2009–10.
 - There was a stronger inverse relationship between the volume of petrol sold and the price of petrol (22 per cent of volume was sold on the cheapest day). However, less petrol was sold on Saturday and Sunday than on the most expensive days.

11.7.4 Case study 1: Brisbane—consumer buying patterns and changes in price cycle duration

Seven-day cycles

Chart 11.23 shows the percentage of average sales volumes and average retail petrol prices by day of the price cycle for the two weeks beginning Friday, 19 November 2011 in Brisbane. These two price cycles were of seven days duration.

Chart 11.23 Average petrol sales volumes and prices by day over two seven-day price cycles, Brisbane: Friday 19 November to Thursday 2 December 2010



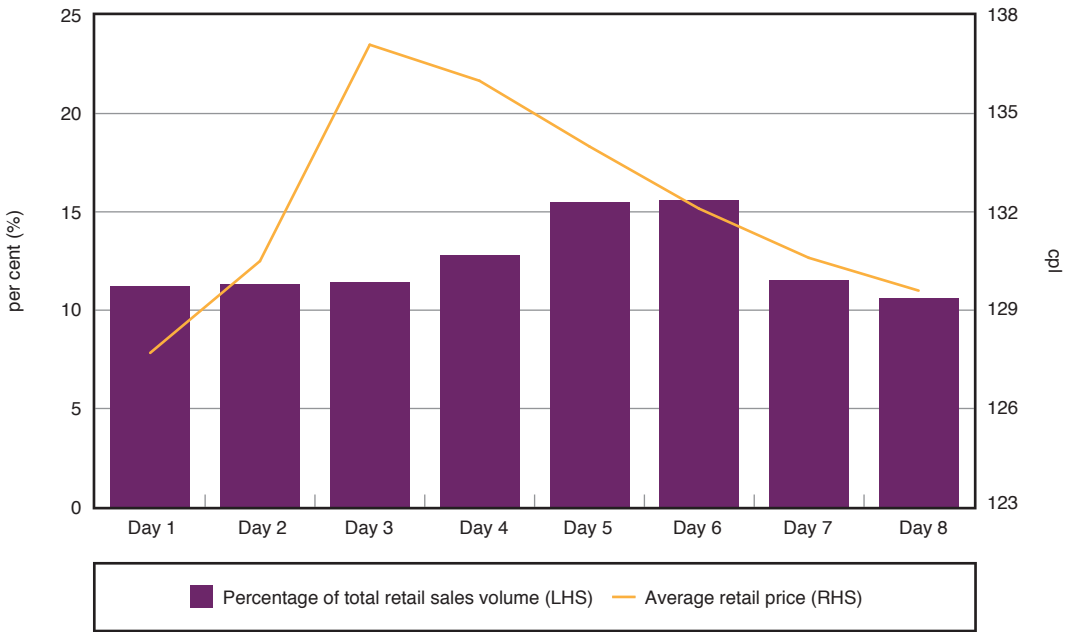
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies.

The chart shows a strong inverse relationship between the volume of petrol sold and the average retail price level across the price cycle. That is, consumers were effectively taking advantage of the lower prices around the trough.

Eight-day cycles

Chart 11.24 shows the percentage of average sales volumes and average retail petrol prices by day of the price cycle for the 16 days beginning Saturday, 11 December 2010 in Brisbane. These two price cycles were both of eight days duration.

Chart 11.24 Average petrol sales volumes and prices by day over two eight-day cycles, Brisbane: Saturday 11 December to Sunday 26 December 2010



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

The chart shows that average retail prices were at a trough on day one. They increased on days two and three, and then gradually decreased through to day eight. However, the largest volumes of petrol were sold on days five and six (over 15 per cent each), when prices were relatively high.

Charts 11.23 and 11.24 suggest that the recent changes in the price cycle (the increasing duration and changes to the peak and trough day from week to week) may have led to a degree of uncertainty among consumers about the timing of the price cycle. When this is the case, consumers in aggregate appear not able to take advantage of the cheaper days in the price cycle to the extent that they otherwise would when the peak and trough days are more predictable.

Case study 2: Melbourne and Perth—daily petrol sales volumes and average prices over a longer period

Daily average petrol sales were compared with daily average retail prices in Melbourne and Perth over June 2011.

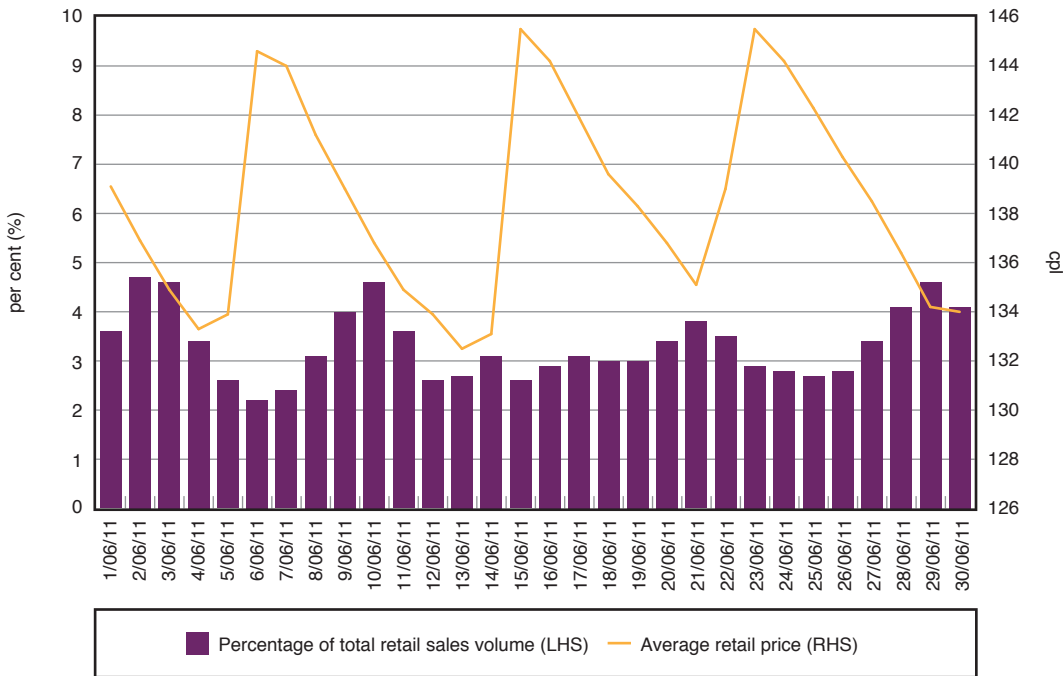
Melbourne

In Melbourne in June 2011, price cycles were around eight to nine days in duration with no day of the week consistently being the peak day or the trough day. In Perth, however, throughout June 2011 the trough was always on Wednesday and the peak was always on Thursday.

Chart 11.25 shows the daily percentage of average sales volumes and average retail petrol prices in June 2011 for Melbourne. It shows that:

- In the first half of the month, higher volumes of petrol were sold one or more days before prices reached the trough.
- In the second half of the month, higher volumes of petrol were sold around the trough.
- Lower volumes of petrol were sold at the peak days, although there was an occasion where low volumes were sold at around the trough (12–13 June) or mid-cycle (25–26 June).
- Overall, consumer buying patterns were somewhat inconsistent over the price cycle. This suggests that the changing pattern of the price cycle is leading to a degree of consumer uncertainty.

Chart 11.25 Daily petrol sales volumes and daily average retail petrol prices, Melbourne: June 2011



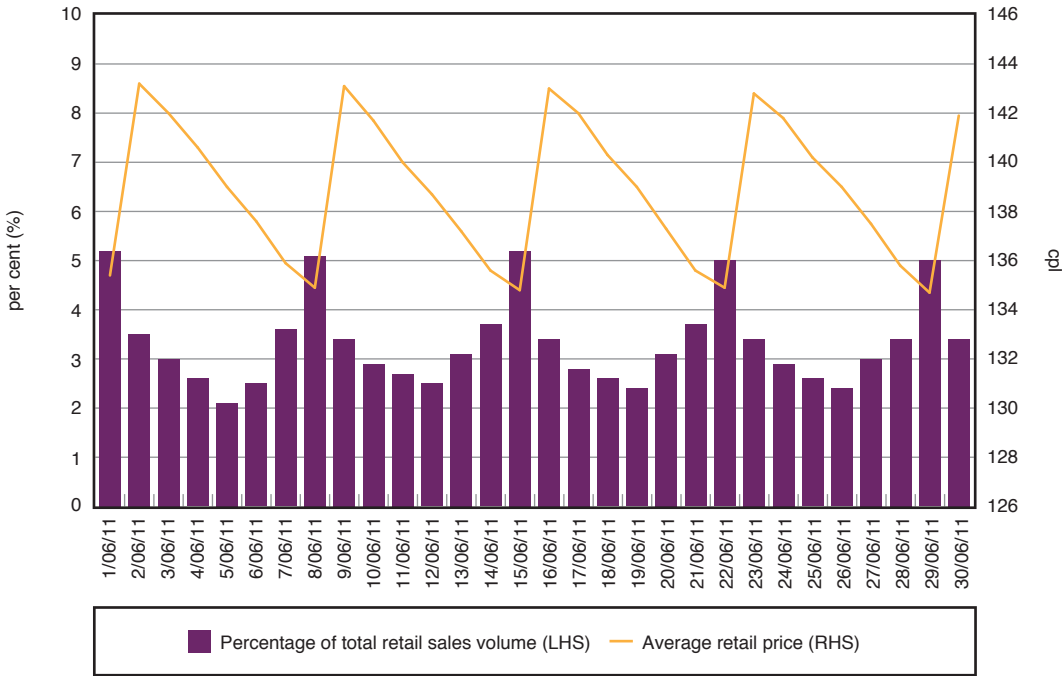
Source: ACCC calculations based on Informed Sources, and information provided by the monitored companies.

Perth

Chart 11.26 shows the daily percentage of average sales volumes and average retail petrol prices in June 2011 for Perth. It shows that:

- More than a quarter of petrol sold in June was sold on the trough day, Wednesday.
- The lowest volume sold during the month was on a Sunday, when prices were on average around 4.0 cpl lower than at the peak.
- On average, the peak day (Thursday) had the third highest volume sales in the month.
- Overall, consumer buying patterns were broadly consistent over the week.

Chart 11.26 Daily petrol sales volumes and daily average retail petrol prices, Perth: June 2011



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

11.8 Price cycle increases and public holidays

It is often claimed that retail petrol prices increase before public holidays. These increases are not surprising as petrol prices increase most weeks in the five largest cities. The 2010 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 2010. 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 (48 per cent) of the time.

As noted in section 11.3 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 four-and-a-half year period January 2007 to June 2011. In each of the years 2007 to 2010, and the first half of 2011, 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 2011). The results are shown in table 11.15. Charts showing price cycle increases and public holidays in the five largest cities in 2010–11 are provided in appendix I.

Table 11.15 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 (45 per cent) of the time.²¹⁷

Table 11.15 Number (and percentage) of price cycle increases before public holidays in the five largest cities: January 2007 to June 2011

Number of price cycle increases before public holidays				
	Total	Greater than or equal to calendar year average	Less than calendar year average	Less than calendar year maximum
Sydney	30	13 (43%)	17 (57%)	30 (100%)
Melbourne	33	13 (39%)	20 (61%)	31 (94%)
Brisbane	32	14 (44%)	18 (56%)	31 (97%)
Adelaide	32	21 (66%)	11 (34%)	30 (94%)
Perth	27	9 (33%)	18 (67%)	26 (96%)
Total	154	70 (45%)	84 (55%)	148 (96%)

Source: ACCC analysis based on Informed Sources data.

The table shows that:

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

²¹⁷ 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. However, the period before a public holiday was extended to two weeks prior to 2009 in Perth (because price cycles in Perth were around two weeks duration up to around April 2008). 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 average annual price cycle increase more than half 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 for the four-and-a-half year period January 2007 to June 2011 are consistent with the conclusions from previous ACCC monitoring reports. They continue to 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.

11.9 Coordinated pricing in the petrol industry

The regularity of price cycles in the five largest cities has enabled the refiner-marketers and other major retailers to largely understand and predict their competitors' likely response to changes in their own behaviour.

The price increases are generally led by BP or Caltex who raise the price at several retail sites in a city by sometimes more than 10 cpl and then wait for the market to respond. If the other major retailers respond to this move with a similar increase (which is generally the case) then the cycle is continued. In some cases where competitors do not respond or delay in responding the price cycle breaks down and prices can remain low for an entire week or more.

While they generally do not initiate the discount phase, Woolworths, 7-Eleven and other independents have been very active in this phase of the price cycle.

Given they do not reflect movements in underlying costs or wholesale prices, retail price cycles appear to be entirely due to the pricing policies employed by the local petrol retailers in the domestic market. Petrol price cycles do occur in other countries but those in Australia tend to be larger in amplitude and more consistent.²¹⁸

In previous petrol monitoring reports the ACCC has noted that the degree of coordination observed in price cycles is a source of concern for Australian consumers and for the ACCC.

Retail petrol markets in Australia are conducive to coordinated conduct. The high level of retail price transparency provided by the sharing of timely and comprehensive price information between major competing fuel retailers through the Oil Pricewatch system provided by Informed Sources assists retailers to quickly signal price moves, monitor competitor's responses and react to them.

The degree of coordination exhibited in the weekly price cycle remains a concern for the ACCC. The ACCC is analysing the likely effects of this behaviour on outcomes for consumers.

²¹⁸ See chapter 11 of the 2007 ACCC petrol inquiry report for analysis of overseas experience of price cycles.

11.10 Concluding comments on price cycles

In 2011:

- The day of the week on which prices peak and trough continued to move through the week.
- There were a greater percentage of price cycles with eight or nine days' duration than in previous years.
- The number of failed price cycles was broadly comparable with prior years (excluding 2009) and the number of truncated cycles was lower than in 2010 but higher than in previous years.
- Reflecting these changes to the price cycle in 2011, consumer buying patterns during the week in 2010–11 were different from the previous year.
- Petrol prices change infrequently during the day—on average less than twice a day—and the vast majority of prices changes are decreases.
- Price cycle increases before public holidays were on average no larger than in other weeks of the year.

