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The impact of lengthening petrol price cycles on consumer purchasing behaviour

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ABSTRACT

This article investigates the impact of petrol price cycles on consumer purchasing behaviour in Brisbane, Australia. By comparing the sales volume data to the gross retail margin—the difference between the recorded retail price and the average terminal gate price, relationships between price and sales volume are examined. This study found that the price cycle observed in some Australian cities has become less predictable and hence it is more difficult for motorists to take advantage of the heavily discounted petrol around the trough. The study uses fuel purchase data for the period between July 2011 and March 2013, collected by the Royal Automobile Club of Queensland.

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1. Introduction

According to Rod Sims, Chairman of the Australian Competition and Consumer Commission (ACCC), the increased duration of price cycles and unpredictability of the low-price day has added to the frustration of consumers, particularly those who seek to take advantage of the low point in the cycle to purchase petrol (ACCC, 2013). Media reports suggest that the recent increase in the duration of the petrol price cycle has changed the purchasing behaviour of consumers. There is little corresponding empirical work investigating whether consumers have changed their purchasing behaviour with respect to the lengthening of the price cycles.

This article investigates relationships between price and sales volume and the subject of the recent lengthening and increasing variability of petrol price cycles. It analyses consumer purchasing behaviour by using sales volume to examine whether consumers purchase more or less petrol on cheap days. This study used Royal Automobile Club of Queensland (RACQ) fuel data collected from 1056 volunteer drivers. The fuel purchase data was collected for the period 1 July 2011–29 March 2013. This article investigates consumers' willingness to buy petrol. The study calculated and analysed total, as well as mean, litres of fuel purchased to gain an understanding of consumer purchasing behaviour.

Petrol prices in Brisbane as well as other large Australian cities including Adelaide, Melbourne, Sydney and Perth follow a price cycle (ACCC, 2014a,b). De Roos and Katayama (2010) describe these price cycles as "frequent, highly asymmetric and

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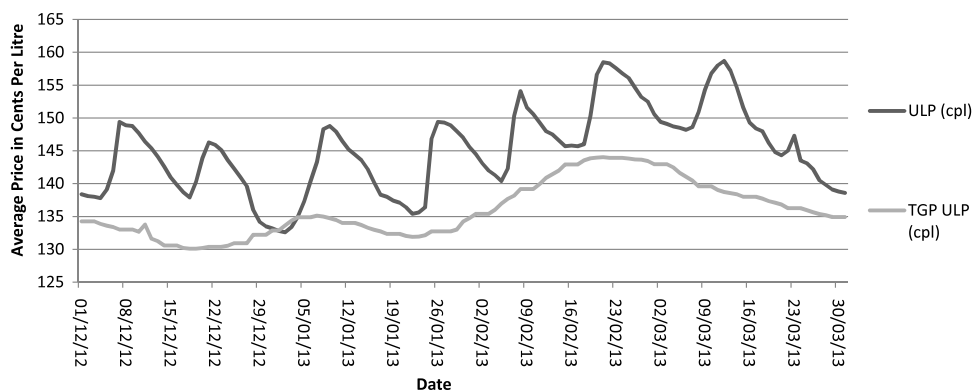


Fig. 1. Average daily retail price for Brisbane, Unleaded Petrol, 01/12/2012 to 31/03/2013.

of substantial amplitude". The cycles follow a saw tooth pattern typified by a short price hike and an extended discounting period (Wang, 2009; ACCC, 2014a,b). Fig. 1 displays the daily average retail price and average terminal gate price for Brisbane, from December 2012 to March 2013. Prior to 2011, the cycle was consistently seven days long and the cheapest day to buy petrol generally fell on the same day each week (ACCC, 2011). As a result, consumers were able to make informed and timely fuel purchasing decisions and could benefit significantly from purchasing fuel at the lowest weekly price (Australian Institute of Petroleum, 2008). Between 2010 and 2014, the length of the petrol price cycle extended from one week to between two and four weeks (Royal Automobile Club of Queensland, 2013).

The hypothesis for this research is that the welfare of motorists is threatened by the lengthening and increasing variability of petrol price cycles. Also, that the petrol price cycle has become less predictable and this makes it more difficult for consumers looking to purchase petrol at the low end of the cycle, when it is cheapest. Following this introduction, Section 2 provides a review of literature. Section 3 presents methodology and a description of variables and data employed in this study. Empirical results are presented and discussed in Section 4. Section 5 outlines the key conclusions.

2. A review of consumer behaviour, petrol prices and price cycles

There is little empirical and theoretical work in Australia on the impact of lengthening petrol price cycles on consumer purchasing behaviour. In November 2007, the Australian National Opinion Polls (ANOP) survey, commissioned by the ACCC, found that 76% of motorists who drive regularly and use unleaded petrol keep a close watch or have a good idea of petrol prices (ACCC, 2007).

The ANOP survey suggests that in 2007 Australian consumers were increasingly feeling the pressure of the changing pattern of the price cycle and the practice of shopping around for the cheapest price was at an all-time high, up from 41% in 2005 to 49% (ACCC, 2007). In their submission to the 2007 unleaded petrol price enquiry (commissioned by the Australian federal government and conducted by the ACCC, reported in ACCC, 2007), Caltex stated that about 60% of Australian consumers were price sensitive (Caltex, 2007), and about 15% were actively comparing prices and about 40% were generally aware of prices.

Petrol price cycles in Australia show similar patterns to the petrol price cycles in the US and Canada (Wang, 2009; Zimmerman et al., 2011). These cycles are typified by a repeated sequence of asymmetric cycles where a sharp price increase is followed by gradual decreases (Wang, 2009; De Roos and Katayama, 2010; Zimmerman et al., 2011). This price pattern is linked to Maskin and Tirole's (1988) theoretical duopoly pricing game that produces a similar pattern to Edgeworth price cycles. Valadkhani (2013a) analysed the cheapest and dearest days in 114 locations in Australia, including capital cities, regional cities and regional centres. They found that the cheapest price of petrol was on Sunday or Tuesday and dearest on Thursday and Friday. This supports the finding of RACQ (2013) that weekly petrol cycles were observed prior to 2010. Valadkhani studied the period January 2005–April 2012. According to RACQ (2013) in the period 2005–2010 the Brisbane ULP market followed a weekly cycle. From 2010 onwards the Brisbane price cycle extended and by late 2012 cycles lasted two to three weeks. Studying disequilibria in Australian petrol market (Valadkhani, 2013b) noted that Brisbane had the greatest level of price asymmetry of the large Australian capitals. The only capital with a greater level of asymmetry was observed in Hobart. Valadkhani continued to assert that Brisbane is one of the cities that should be closely monitored by regulatory bodies.

Wang (2009) in a case study in Perth undertaken in 2002, investigates and confirms the assumption that consumers are sensitive to price differentials between retailers. They measure the cross-price elasticity between retailers in the Perth market and find a high degree of cross-price elasticity between neighbouring retailers. Price differentials between neighbouring retailers will lead to higher sales volumes at the cheaper retailer. Wang (2009) noted that elasticity increases with proximity of competing retailers, cross-elasticity between neighbouring retailers was substantially higher than retailers several kilometres apart. De Roos and Katayama (2010) provide a description of retailer behaviour in Western

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