Full length article

The impact of major fuel retailers on regional New South Wales petrol prices

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Abstract

Consumer discontent suggests the lack of competition and the absence of independent retailers in Australian regional centres maintains upward pressure on petrol prices. These claims are examined by estimating a reduced form price model to assess the impact that major retailer market concentration, station density, brand effects and other variables may have on prices. Employing data from the New South Wales government’s mandatory FuelCheck reporting system, higher degrees of market concentration and lower station density in regional centres are found to impact prices positively. These findings are robust across data types including: individual station level retail prices, regional averages, retailer margins and alternative Australian Competition and Consumer Commission data. The negative price impacts of introducing an additional non-major retailer are estimated for individual regional centres and on average range from one half to one and half cents per litre depending on fuel type. These estimates appear to be small which, in part, may be the consequence of the sample focus on regional centres only and the introduction of FuelCheck and its objective to improve price transparency in the market.

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1. Introduction

The existence of asymmetric price cycles in metropolitan retail petrol prices in Australia has resulted in a growing body of literature aimed at understanding the determinants and effects of price fluctuations. For example, the Australian Competition and Consumer Commission (ACCC) (2014) and Valadkhani (2013a, b, c) examine the determinants of price changes using a series of timing factors and demographic variables, while Webb (2000) and Valadkhani and Mitchell (2002) examine the effects of petrol prices on measures such as inflation and household expenditures. Limited attempts, however, exist which explain why petrol prices are higher in regional locations compared to metropolitan centres, and why prices vary significantly between the regions. In part, the ACCC (2014) suggests higher and variable petrol prices in regional locations may be a product of lower levels of competition. However, as argued by Ning and Haining (2003) and Heppenstall et al. (2013) understanding of the dynamics and processes within spatially diversified petrol retail markets is highly challenging because of the complexity brought about by the interaction of consumers’ and competitors’ behaviours.

The nature of retail petrol price competition in Australian regional areas resonates strongly with consumers. Reports from regional media outlets about consumer discontent (for example, Port Macquarie News, 2013; Daily Advertiser, 2014;
Western Advocate, 2015) blame the dominance of major fuel retailers and the lack of independent retailers for higher prices in some regional centres. Despite the importance of the issue, there appears to be no substantial body of literature for Australian regional markets which explicitly addresses the influence major fuel retailers have on prices.

In addition to the impact of high petrol prices on consumers, from an industry policy perspective, it is also important to know what factors explain regional price variation. Given that high fuel prices directly impact transport and production costs, then an understanding of the factors determining prices would help design policy to help ensure the sustainability of regional locations. This issue is important since many industries in regional areas experience a loss of competitiveness resulting from higher costs, inefficient infrastructure and skill shortages (Sharma et al., 2016).

The aim of this paper is to empirically model regional fuel prices by employing a reduced form hedonic price specification using demand and supply fuel determinants. In addition to other factors, the employed specification will assess the price impact of major petrol retailers through market concentration, petrol station density and fuel brand measures. The focus is on regional New South Wales (NSW) prices given the recent advent of FuelCheck. In 2016, the NSW government introduced FuelCheck to mandatorily require all petrol stations to report prices. The mandatory nature of FuelCheck and the ability of the government to financially penalise outlets for misreporting, improves price transparency and provides some credence for the accuracy of the data.

The paper is organised as follows. Section 2 provides a review of the general international petrol price modelling literature and the related literature as it pertains to Australian markets. Section 3 presents an overview of the structure of the Australian fuel sector. In Section 4 the data and employed empirical specification is presented, with the empirical results described in Section 5. Section 6 concludes with a discussion of the implications of the results.

2. Empirical models of station petrol prices

2.1. General petrol price literature

Eckert (2013) surveys the international literature on empirical models of petrol station retail price or margin determination. To explain station level prices or margins, four sets of variables are used: (1) local competition; (2) local demography or location; (3) brand or vertical structure; and (4) station characteristics.

For the study of local competition and the influence of major brands, market concentration variables are employed. Two measures are typically used: (1) the proportion of stations associated with the major refiners or brands (or alternatively the proportion of independents), and (2) the Herfindahl–Hirschman Index (HHI) which employs volume shares. The expected impact of the variable is positive, that is, the greater the degree of market concentration, the higher the price. Two arguments suggest this, see Clemenz and Gugler (2006). If a firm can set up a cluster of local outlets then that protects it from outside competition and permits it to charge higher prices. Alternatively, there may be tacit collusion in driving higher prices if fewer firms exist. Previous empirical models produce mixed results. Clemenz and Gugler (2006) for Austria find no significant impact at a broad district level but identify significant positive effects at the zip code level. For Canada, Sen and Townley (2010) find that the HHI is significant and positive if ordinary least squares (OLS) is used but insignificant for an instrumental variables (IV) estimator. Finally, Nowakowski and Karasiewicz (2016) conduct a cross country study of European Union nations and find that market concentration significantly and positively influences prices.

The assessment of local demography influences on prices have predominantly been through station density variables. To assess station density three measure are typically used: (1) the number of stations within a certain radius distance; (2) the number of stations per population; and (3) the number of stations per sq km. The latter two measures tend to be highly correlated but have a different interpretation from the absolute number of local stations. Ceteris paribus, the greater the number of stations, the greater competition among stations which forces prices down. Barron et al. (2004) outline the theoretical models which support this monopolistic competition interpretation, but contrasts this to consumer search-theoretic models which may imply a positive relation between the number of sellers and prices. In contrast to absolute measures, when a per capita (or sq km size) measure of the number of stations is employed, an increase in the density can occur for at least two reasons: (1) a higher number of stations, which potentially increases competition and hence reduces prices; or (2) a lower population which reflects a smaller market, leading to diseconomies of scale (weaker coverage of fixed costs) and hence higher prices. The relative effects of these opposing forces will determine the relation between density per capita and prices, see ACCC (2014) and Nowakowski and Karasiewicz (2016).

Given this recognition, it is not surprising that the estimated relation between station density and prices is mixed. Van Meerbeeck (2003) for Belgian and Barron et al. (2004), Cooper and Jones (2007) and Yilmazkuday and Yilmazkuday (2016) for the USA estimate a statistically significant and negative relation between absolute station density and prices. While, employing either stations per capita or per sq km, Clemenz and Gugler (2006) for Austria find a negative relation with prices; Sen and Townley (2010) for Canada identify a significant negative relation when using an IV estimator (but not OLS); and Nowakowski and Karasiewicz (2016) estimate a positive relation across EU nations.

Additionally, at least two studies including Hosken et al. (2008) for the USA and Pennerstorfer (2009) for Austria, use a number of separate variables to identify the impact of station density on prices. Hosken et al. (2008) finds that the number of stations is unimportant when used as a separate regressor with population (negative and significant) and population density (positive and significant) variables, while Pennerstorfer (2009) finds three separate significant price effects from the number of stations (negative), stations per capita (positive) and population density (positive).
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