

Daily Price Cycles and Constant Margins: Recent Events in Canadian Gasoline Retailing

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Retail gasoline pricing in Canada has typically followed two or three distinct patterns. First, many markets have shown considerable price rigidity relative to wholesale prices, with prices remaining constant often for weeks or months at a time, despite wholesale prices typically adjusting daily. In contrast, other cities exhibit the Edgeworth cycle pattern now widely documented in Canada, the U.S., Europe, and Australia. In such a pattern, retail prices increase quickly within one or two days, and fall slowly back to initial levels, typically within days or weeks. Finally, markets that appear to exhibit neither cycles nor price rigidity have been classified in the literature as following cost-based pricing.

One purpose of this paper is to provide detailed evidence regarding the changes to pricing patterns in a number of Canadian cities. Establishing these stylized facts is an important first step that should lead to extensions of price cycle theory.

We first examine the timing and location of price volatility changes. To do so, retail prices were obtained from the Kent Marketing website, which consist of the average price of a consistent sample of stations taken each Tuesday morning at 10:00 AM. We find that volatility in the retail margin in Toronto falls in late 2004; margins then become almost constant in February 2007.

To consider whether this reduction in volatility occurred in other Canadian retail markets, weekly retail prices were obtained for 30 Canadian cities surveyed by Kent Marketing over the 2000–2010 period. Cities in Atlantic Canada were excluded because of price regulations in the Atlantic provinces. While the Quebec retail gasoline industry was subject to a price floor during our sample period, it is included because of its proximity to Ontario.

We find that four other cities experienced large reductions in volatility. London, Hamilton, and Ottawa experience shocks similar to those observed in Toronto, with volatility reductions in 2004, and roughly constant margins as of early 2007. In addition, a reduction in margin volatility is observed in Vancouver, British Columbia in 2004, but without the switch to constant margins in 2007. In all other cities in our sample, margin volatility was greater on average from 2005–2010 than from 2000–2004.

The cities that exhibit both shocks to margin volatility are concentrated in southern and eastern Ontario. Nonetheless, not all cities in this area exhibited the changes to margin volatility.

Next, we use data collected from GasBuddy.com for Toronto, Ontario to describe the retail pricing patterns that existed before the first and second shocks to margin volatility discussed above. Data consisting of all price reports received by this website from January 1, 2004 (prior to the first supply shock) to June 16, 2007 were purchased from GasBuddy.com. This dataset was supplemented with price data for the period June 17, 2007 to September 17, 2009, collected from the website by the authors, every 12 hours at noon and midnight Eastern Standard Time.

Retail prices in 2004 prior to the first shock in volatility appear to follow a standard Edgeworth cycle, with price restorations occurring on average every 2.6 days. During June and July, 2004, retail price restorations become much more frequent, occurring almost daily. Over the period from July 2004 to January 2007 (immediately preceding the second shock), restorations occur on average every 1.2 days. During the period from July 2004 to January 2007, price restorations overwhelmingly occur overnight.

While daily or near-daily price cycles occurred for most of this period, there were some periods of relative price stability. A dramatic decline in the rate of price

restorations occurred in August and September 2005, corresponding to Hurricanes Katrina and Rita.

We then consider some possible explanations for changes in the nature and presence of price cycles, which highlight the role of wholesale supply and capacity constraints, and also the effect of retail market structure. In summary, the immediate cause of the changes to pricing in 2004 is unclear. These changes may be affiliated with the initiation of new sulfur content regulations and the associated shutdown of Petro-Canada's Oakville, Ontario refinery. Price wars due to the entry of and discounts offered by supermarket owned stations may have triggered a pricing change in Vancouver, and have been associated with price wars in southern Ontario. However, the presence of these retailers in our cities of interest was small. Hurricanes in 2005 explain the temporary elimination of daily price cycles in Toronto, but do not appear to have had a permanent effect. Finally, the switch to constant margins in 2007 seems clearly associated with the supply disruption caused by the Nanticoke, Ontario refinery fire (in conjunction with the rail strike and scheduled refinery maintenance). This temporary event may have triggered a permanent switch from one pricing equilibrium (daily cycles) to another (constant margins).

As a second contribution, this paper illustrates the effect that price data frequency can have on policy analysis. Much of the analysis of Canadian gasoline retail pricing has been conducted using price data from Kent Marketing Services, in which a sample of stations in a city is surveyed each Tuesday morning. Such data have also

played an important role in policy analysis, being used repeatedly in reports issued by the Competition Bureau and Natural Resources Canada. In this paper, we combine the Kent price data with the high-frequency price data obtained from GasBuddy.com to examine how the discrete changes in pricing patterns are reflected in the different data sources.

We find that given the fact that these Kent price data are typically collected on Tuesday mornings, they can produce a misleading picture of pricing in a retail market that is subject to a price cycle. We see that if gasoline prices are restored overnight or in the early morning in a market, Kent price data can overestimate margins and underestimate the change in margins. In addition, observations of weekly average prices do not contain enough information to fully describe the underlying dynamics of pricing in retail gasoline markets. Policymakers using weekly average price data need to proceed with caution when trying to draw any conclusions about pricing in a market characterized by a price cycle.