Technical attachment – Analysis of impact of changing costs on retail fuel prices

This attachment provides the technical detail on the cost pass-through analysis we undertook to examine whether cost increases and decreases are passed through symmetrically to retail fuel prices. The attachment begins with an executive summary of our analysis and findings.

Sections 1 and 2 present an overview of asymmetric cost pass-through, data, and the analysis and model.

Sections 3, 4 and 5 present the results and a discussion.

Section 6 discusses the economic model and alternative approaches.

Executive summary

In a competitive fuel market, changes in costs should be fully passed through to retail prices at the same (symmetric) speed whether costs increase or decrease. The purpose of this report is to analyse whether there is cost pass-through asymmetry in the New Zealand fuel market. While it may not necessarily be a direct result of overt anti-competitive behaviour, asymmetric cost pass-through is not expected to occur in a workably competitive market.

To investigate the possible presence of asymmetric cost pass-through, the Commerce Commission replicated an analysis by the CMA (Competition and Markets Authority) in the United Kingdom in their 2023 market study into retail fuel.[1] Utilising this model, the CMA found some evidence for asymmetric pass-through in 2022/23 for diesel in the United Kingdom.

The Commission last examined asymmetric pass-through in the 2019 market study, which did not find evidence of asymmetry. While the focus of this analysis is on the model utilised by the CMA, the approach used in the market study is also estimated here for comparison. The model and its results are summarised in section 6.

Our data sources include Gaspy and the Ministry of Business, Innovation and Employment (MBIE).[2] The work complements the analysis of data that we receive from fuel sector participants under the Fuel Industry Act. We utilise the broader coverage of fuel sites in Gaspy data to obtain a comprehensive view of the industry.

Utilising Gaspy and MBIE data from January 2019 to November 2023, we find evidence of asymmetry in the speed of cost pass-through in the New Zealand fuel market – prices increase like a rocket but fall like a feather in response to cost changes. We find that both regular and premium petrol prices respond to cost increases faster than cost decreases, a

1 Competition and Markets Authority (CMA). (2023). Supply of road fuel in the United Kingdom market study. https://assets.publishing.service.gov.uk/media/64a280e845b6a200123d46e7/Supply_of_road_fuel_in_the_United_Kingdom_market_study_Final_Report.pdf.

2 Gaspy is a fuel finding smartphone application with live fuel prices.

pattern also seen in certain Canadian markets utilising the same model.[3] This asymmetry could be working to inflate firms' margins in the short term.

The analysis demonstrates that while there is no evidence that firms eventually fail to pass-through any cost change, there is evidence to suggest that they pass-through cost increases faster than cost decreases in the initial weeks after a cost change, exhibiting "rocket and feather pricing".

The results of this analysis imply that consumers can face higher prices than they should, especially in periods of rapid price changes, as firms utilise cost changes as a short-term opportunity to increase margins, at consumers' expense. Consumers of Regular 91 and Premium 95 fuel may be the victim of lethargic price movement in response to a cost decrease, compared to rapid price responses to cost increases.

1. Asymmetric cost pass-through overview

Asymmetric cost pass-through relates to a form of pricing behaviour that, while not an explicit sign of collusion, has been linked to firms exercising market power. This allows firms to inflate profit margins (most notably in the short term) at the expense of consumers, by pushing cost increases onto prices faster than cost decreases.

Cost pass-through asymmetry has been widely evaluated in related literature with a specific term, rocket and feather pricing, being attributed to a specific kind of behaviour. This term refers to how prices may rise quickly like a rocket when costs increase but fall slowly like a feather when costs decrease. [4]

The result of asymmetric pass-through is an inflation of firms' profit margins. This is noted in the 2023 market study into retail fuel by the CMA, who additionally noted that evidence of this behaviour may not in itself be indicative of a lack of competition.[5] Academic literature has demonstrated links between pass-through asymmetry and anti-competitive behaviour. For example, asymmetric pass-through can occur when firms fail to undercut rivals' prices as costs decrease, resulting in a lack of price reduction.

A possible explanation for this outcome is that firms engage in a repeated Bertrand game with a 'grim trigger' strategy.[6] In this setting, following a cost decrease firms would maintain a higher than competitive price level and 'share' the market. The trigger occurs whenever a firm decides to undercut their rivals' price to increase its share of sales in the market. Following this trigger, firms begin to compete, and price is pushed down to a competitive

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3 Byrne. D. P. (2019). Gasoline Prices in the Country and the City.

4 We found evidence of rocket and feather behaviour in mortgage lending as part of our Market study into personal banking services, see: https://comcom.govt.nz/__data/assets/pdf_file/0029/347375/Dimitris-Margaritis2C-Maryam-Hasannasab-Market-power-in-banking-A-study-of-New-Zealand-banks-March-2024.pdf.

5 Competition and Markets Authority (CMA). (2023). Supply of road fuel in the United Kingdom market study. https://assets.publishing.service.gov.uk/media/64a280e845b6a200123d46e7/Supply_of_road_fuel_in_the_United_Kingdom_market_study_Final_Report.pdf.

6 Verlinda. J. A. (2008). Do Rockets Rise Faster and Feathers Fall Slower in an Atmosphere of Local Market Power? Evidence from the Retail Gasoline market. Bertrand competition is where firms compete by setting prices and consumers select the quantities purchased at these prices.

level. At this point firms share the market at a lower price than before, reducing every firm's profit. The stability of this game is dependent on a few factors, most commonly the patience of each firm (the less patient any given firm is, the more likely it is to undercut rivals to increase profit in the short term at the expense of higher long-term margins), and the number of firms in the market (a larger number of firms increases the likelihood of a grim trigger occurring). While this is not explicit collusion, it may demonstrate an ability to tacitly collude under the right market conditions.

This grim trigger strategy theory may explain an observed relationship between pass-through asymmetry and the presence of firms with large market power, as found in one US study.[7] Another study in Canada found that 'sticky prices' were utilised by fuel retailers as a method to inflate prices above costs and help maintain a stable cartel.[8] The cartel was discovered by authorities and the participants involved were charged.

More recent papers have engaged in pass-through asymmetry analysis. One such article identifies other variables that influenced asymmetric pass-through in fuel stations in Ontario, finding that one of the largest was the distance between a station and their single closest competitor.[9] The relationship between cost pass-through asymmetry and competition means that its presence may be an indicator of a firm's ability to derive greater profit from the market through the exercise of market power.

A separate theory on the possible cause of rocket and feather pricing proposes that consumers' behaviour affects the speed of cost pass-through.[10] This theory proposes that when costs are consistently high, consumers form an expectation that prices are high, and they are unlikely to search for lower prices. An expectation that prices will sit around their current levels means that, when costs decrease, consumers are unlikely to search for a lower price alternative, allowing firms to pass-through a cost decrease slowly. Various other theories have also been developed.[11, 12]

2. Models/Analysis Structure

2.1. Data

The data utilised in this analysis come from two sources, spanning from January 2019 to November 2023.

Weekly importer cost data is sourced from MBIE. This dataset contains weekly values for average importer cost, tax, and fuel price in cents per litre.[13] All variables are national level, with one observation for each variable in each week. This source is used to estimate the

7 Deltas, G. (2008). Retail gasoline price dynamics and local market power.

8 Clark. R., J. F. Houde. (2013). Collusion with Asymmetric Retailers: Evidence from a Gasoline Price-Fixing Case.

9 Byrne. D. P. (2019). Gasoline Prices in the Country and the City.

10 Tappata. M. (2009) Rockets and Feathers: Understanding Asymmetric Pricing.

11 Ball. L., Mankiw. N. G. (1994) Asymmetric Price Adjustment and Economic Fluctuations. This paper proposes that menu costs along with trend inflation mean that costs should be updated more frequently for cost increases than for decreases.

12 Eckert. A. (2002) Retail Price Cycles and Response Asymmetry. This paper identifies a cyclical pricing pattern which can result in asymmetry appearing to exist in analysis, even if the behaviour is not present.

13 The publicly available MBIE dataset can be found here. Weeks are from Saturday to Friday.

change in costs over time for each station. Our dataset contains observations for three fuel types: Regular 91, Premium 95, and diesel.

Daily station-specific price data is provided by Gaspy. The dataset contains prices for all displayed fuel types, for Regular 91, Premium 95, and diesel in cents per litre. We then aggregated these data to weekly averages by station to align with the time frequency of cost and tax data sourced from MBIE. This data is used because it allows for analysis at a station-specific level.

2.2. Model

This analysis replicates a model utilised by the United Kingdom's CMA in its 2023 retail fuel investigation. The model is an Error Correction model (ECM) and is often used to investigate price-cost pass-through asymmetry. A more detailed explanation of the model is given in section 6.

An ECM examines pass-through over a chosen time period, evaluating the lagged impact of a cost shock. It builds Impulse Response Functions (IRFs) that show how prices are expected to change in future periods given a cost increase or decrease. To evaluate asymmetry, the model estimates two sets of parameters, a set for positive cost changes and a set for negative cost changes. Asymmetry is found if there is a significant difference between the IRF for a positive cost change and the IRF for a negative cost change. The primary specification of this model uses prices excluding taxes. This model assumes that importer costs are the only remaining external factor impacting on price changes. For robustness, we also estimated the model with two alternative specifications: tax as a separate independent variable and prices including tax as the dependent variable.

It should be noted that this model does not necessarily establish a causal relationship. Other factors may influence prices, such as changes in demand, local competition, inventory levels, etc.

The ECM is dynamic because it captures multiple levels of lagged effects, from cost changes and price changes, allowing for an analysis of how pass-through evolves over time. This allows for detection of behaviour such as rocket and feather pricing, whose impact is only identifiable in the time periods before pass-through is complete.

3. Results

Our results show asymmetric pass-through for Regular 91 and Premium 95: that is cost increases are passed through more immediately than cost reductions. This effect is short lived. This effect is not present for diesel.

Figures 1-3 show the absolute price change in response to a 1 cent change in cost, with the blue line showing the response to a positive cost change, and the red line showing the response to a negative price change. The dotted lines are 95% confidence intervals.

Figure 1 – Impulse Response Function for Regular 91

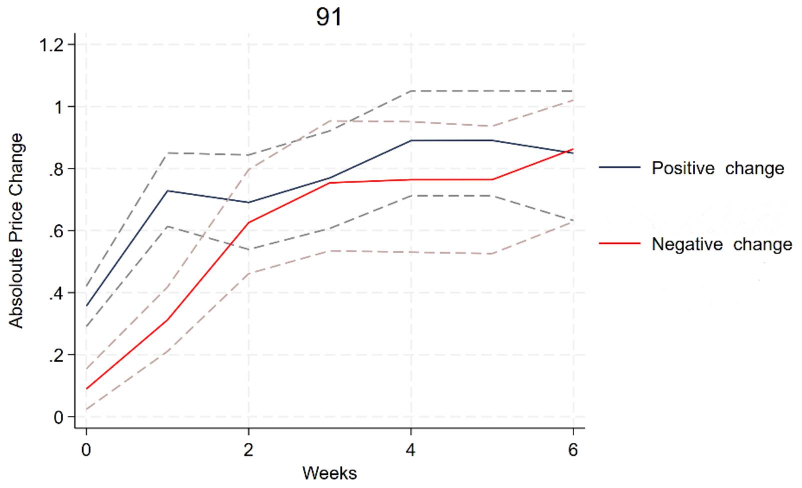


Figure 2 – Impulse Response Function for Premium 95

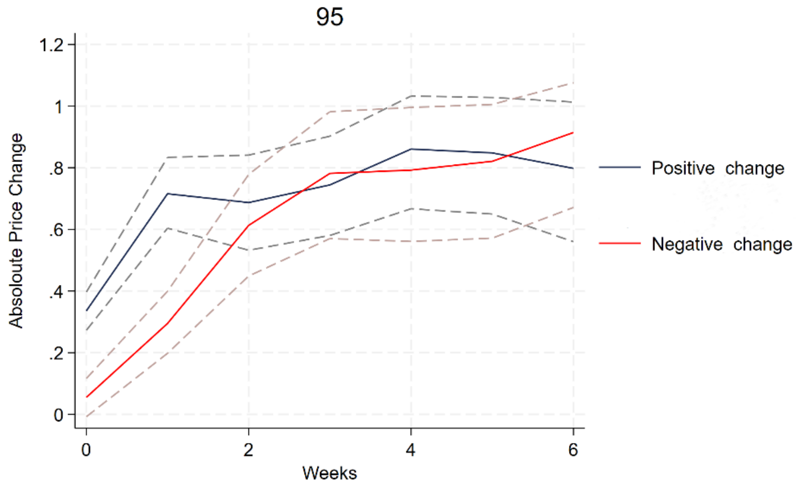
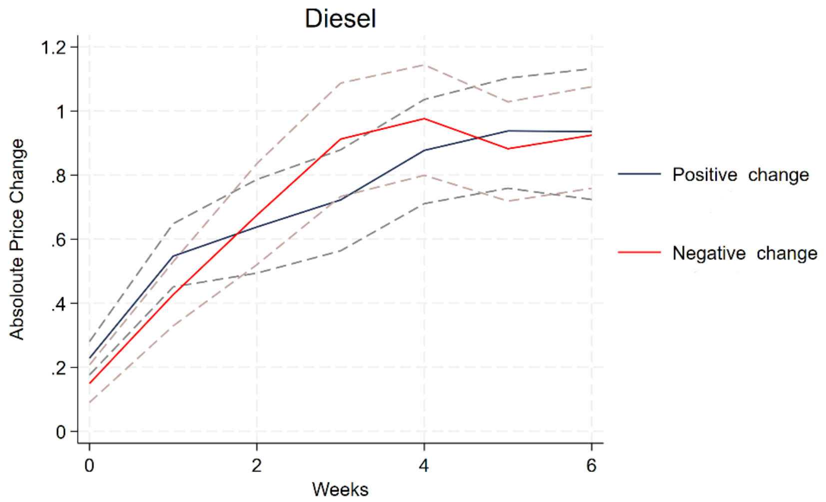


Figure 3 – Impulse Response Function for Diesel



For Regular 91 and Premium 95, asymmetric pass-through can be seen both contemporaneously in the week of the cost change and in the first week following the cost change. Only about a third of a cost decrease is passed through after one week; in contrast, 70-80% of a cost increase is passed through in the same time frame. The difference between pass-through rates is statistically significant in the first week. This is not the case after two weeks as the response functions trend closer. Asymmetry then disappears for both fuel types.

The effect of this asymmetry is an inflation of firm margins in the short term. In the initial weeks following a cost decrease, the slow pass-through results in a larger gap between cost and price. Over time this fades away.

In contrast to other fuel types, the diesel market appears to operate as would be expected in a workably competitive market, with no statistically significant asymmetry.

Robustness checks using other specifications support these findings.

3.1. The model was estimated with multiple levels of lags that all maintained the same patterns in the initial weeks of the pass-through.

3.2. Different model specifications were used to allow for different equilibria across different years. All specifications found results that supported the conclusion of the primary model.

3.3. The model was estimated using data from 2021-2023 to exclude the disruptive period around the COVID-19 pandemic. Again, the results supported the conclusions of the primary model.

3.4. Two variations with differing approaches to tax were also estimated. The first model included tax in the regression separately from price and cost (model specifications are displayed in section 6). The second model considered tax as a part of cost. The rocket and feather behaviour was not present when tax is considered as a part of cost (possibly due to preliminary analysis finding that tax is passed through contemporaneously with no asymmetry), but the behaviour was present when tax was included as a separate variable. It should be noted that the approach taken in the primary model (using a pre-tax price) is used in the wider literature.[14, 15]

4. Discussion

These results are interesting as they indicate that asymmetry may be present in fuel pricing, with different levels of asymmetry across fuel types. This section discusses the possible reasons for this and how this relates to the literature.

Asymmetric pass-through is more often present in markets with less competition, as a limited number of firms decreases the possibility of undercutting occurring at any given point in time. This may come into greater consideration given the localised nature of

[14] Byrne. D. P. (2019). Gasoline Prices in the Country and the City.

[15] Borenstein. S., Cameron. A. C., Gilber. R. (1997) Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?

competition in retail fuel markets. However, this theory cannot explain the lack of asymmetry in diesel.

A possible explanation for the difference in cost pass-through between diesel and the two petrol fuels may stem from differences in market composition combined with consumer behaviour. A much higher proportion of diesel buyers is commercial users than is the case for petrol, which is predominantly a retail market. To the extent that retail consumers may undertake less searching for better prices, particularly around times of high cost, this could result in a greater degree of asymmetric pass-through in relation to petrol.[16] This is because if petrol consumers are less likely to search for lower prices, there may be less pressure to pass on cost decreases when compared to diesel, resulting in the difference in asymmetry observed.

In any event, this report provides evidence of rocket and feather pricing patterns in the fuel market through a delayed pass-through of cost decreases relative to cost increases. This suggests a degree of market imperfection, but there is no requirement for explicit collusion for this behaviour to take place. Given this behaviour is not aligned with what should be seen in a workably competitive market, this suggests an opportunity for further analysis.

Further analysis could consider these two further areas. The first concerns the stages of the supply chain that may face asymmetric pass-through. This analysis utilised importer cost data reported by MBIE, analysing pass-through over a large portion of the industry. Analysis around the pass-through of cost changes at different levels of the supply chain may provide deeper insight into where asymmetry originates, for instance whether at the wholesale or retail level, or a mixture of both. A second area for consideration may be into a fuel station specific analysis into patterns of asymmetry.[17] This would be best done with station specific costs, allowing for a more robust analysis of pass-through across each station. This analysis could better illustrate the factors related to asymmetric cost pass-through in the New Zealand fuel industry.

5. Risks and limitations

Gaspy data has the advantage of being disaggregated, daily data at station level. However, when prices do not appear to change in the Gaspy dataset, we cannot tell whether prices were actually stationary or if price changes were not reported in the Gaspy application.[18] There are also periods with missing information in the Gaspy data.

As well as not being able to undertake this analysis at a daily frequency, while price data is available at the station level, the cost data is not and instead a nation-wide average must be

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16 Tappata. M. (2009) Rockets and Feathers: Understanding Asymmetric Pricing.

17 Byrne. D. P. (2019). Gasoline Prices in the Country and the City. This study analysed asymmetry at each station and used linear regression to identify variables with the largest relationship to asymmetric pass-through.

18 Gaspy data is crowd-sourced and reliant on members of the public / app users to update.

used. It should be noted that stations do not all face the same costs, but the assumption made in this analysis is that the cost changes will not differ across stations.[19]

In addition, the volatility present in the market following the COVID-19 pandemic, the Russia/Ukraine conflict, and more recent cost-of-living fuel tax relief may have disrupted industry dynamics, preventing any stable equilibrium from forming and therefore limiting the robustness of the ECM. Our robustness checks in section 3.3 above, removing the COVID-19 affected period, did support the conclusions drawn from the full period.

6. Further Error Correction model explanation

The model utilised is an Error Correction model, a replication of the model utilised by the CMA.[20] These models are built on two main assumptions. The first is that the market has a long-term equilibrium that it tends towards. The second is that the impact of a previous cost shock on current prices is a cumulative effect of the lagged impact of the shock on the current price, in addition to its impact on prices in previous periods and their flow on effects to the current price. The second assumption is built into the main model regression, with the version utilised by the CMA given below.

$$\Delta price_t = \sum_{i=1}^{n} \beta_{t-i}^{+} \Delta price_{t-i}^{+} + \sum_{i=1}^{n} \beta_{t-i}^{-} \Delta price_{t-i}^{-} + \sum_{i=0}^{n} \gamma_{t-i}^{+} \Delta cost_{t-i}^{+} + \sum_{i=0}^{n} \gamma_{t-i}^{-} \Delta cost_{t-i}^{-} + \delta^{+} z_{t-1}^{+} + \delta^{-} z_{t-1}^{-} + \varepsilon_t$$

As is standard in ECMs analysing cost pass-through asymmetry, the model utilises two different variables for each value, with z^{-} referring to $\min\{0, z\}$ and z^{+} referring to $\max\{z, 0\}$. This enables the model to build two separate market responses (Impulse Response Functions (IRFs)), one for a cost increase and another for a cost decrease. z refers to the error correction term and is the residual from the simple regression of retail prices on contemporaneous wholesale cost below.

$$price_t = \theta_0 + \theta_1 cost_t + z_t$$

The error correction term embodies the first assumption, that the prices have a long-term equilibrium relationship with cost. Pre-tax prices are used, although an alternative specification is also used that includes tax and utilises board prices. The assumption of a long-term equilibrium means that all cost changes do eventually reach the same level of pass-through, an assumption that should hold if the market behaviour does not differ greatly over the relevant time period. A relaxation of this assumption can be accommodated: the CMA calculated the error correction term with the addition of a dummy for the period 2022/23, to allow for a different equilibrium across different time periods. Other approaches have added in dummy variables for each station, allowing for different equilibria across

[19] For further analysis of variation in retail prices and costs, see the Commission's Retail fuel price variation report: https://comcom.govt.nz/__data/assets/pdf_file/0020/351146/Weaker-competition-in-some-local-markets-appears-to-be-contributing-to-variation-in-retail-petrol-prices-April-2024-.pdf.

[20] ECMs are first detailed in Borenstein. S., Cameron. A. C., Gilbert. R. (1997) Do Gasoline Prices Respond Asymmetrically to Crude Oil Price Changes?

stations.[21] A further extension of this could involve allowing each station to have its own equilibrium value, and estimating the error correction regression for each station. Our analysis uses a 2019-2023 market level equilibrium for its primary analysis; we have also tested regressions with multiple equilibria, with dummies to account for the disruption of the COVID-19 pandemic.

Asymmetry is found by estimating the regression then simulating a 1 cent cost increase and 1 cent cost decrease to build the two IRFs respectively. A statistically significant difference between the two IRFs over time is a pass-through asymmetry. The price change at any point after a cost shock is found from (1) the previous periods' price, (2) the impact of the cost shock on the current period, (3) the impact of being away from the equilibrium, and (4) the lagged impact of previous price changes. The expressions for the first three periods are as follows (P = pass-through, γ and β values are negative or positive for the associated price/ cost change value):

$$P_0 = \gamma_0$$

$$P_1 = P_0 + \gamma_1 + \delta(P_0 - \theta_1) + \beta_1 P_0$$

$$P_2 = P_1 + \gamma_2 + \delta(P_1 - \theta_1) + \beta_1(P_1 - P_0) + \beta_2 P_0$$

Unlike the model used in our retail fuel market study, this analysis allows for possible asymmetry at every time period over the period measured.

A parametric bootstrap is used to construct the confidence intervals for the IRFs. 1000 random values for the coefficients are drawn from their variance-covariance matrix and means, and each set of values drawn is used to construct an IRF. Sorting by ascending order, the confidence intervals are the 50th and 950th values found for each period.

Another consideration for this model is the number of lags chosen. The CMA market study uses up to 5 weeks of lag after a combination of statistical assessment and total pass-through analysis. This analysis utilises 6 weeks of lag, as it best fits the statistical significance of the coefficients over time. Robustness checks with different lags (4-10 weeks) were conducted before the 6 week lag was chosen.

The model does come with an additional assumption of co-integration between cost and price. To test this assumption, the Engle-Granger test was used. This found co-integration with 99% confidence for all fuel types, using average fuel price and average fuel cost per week. Of note is that the assumption of co-integration does not hold for petrol fuel utilising default importer costs (from MBIE dataset) and board price (from Gaspy data).

[21] Byrne. D. P. (2019). Gasoline Prices in the Country and the City.

Alternative Error Correction Model

Primary Regression –

$$\Delta price_t = \sum_{i=1}^{n} \beta_{t-i}^{+} \Delta price_{t-i}^{+} + \sum_{i=1}^{n} \beta_{t-i}^{-} \Delta price_{t-i}^{-} + \sum_{i=0}^{n} \gamma_{t-i}^{+} \Delta cost_{t-i}^{+} + \sum_{i=0}^{n} \gamma_{t-i}^{-} \Delta cost_{t-i}^{-} + \delta^{+} z_{t-1}^{+} + \delta^{-} z_{t-1}^{-} + \Delta tax_t + \varepsilon_t$$

Error Correction Term –

$$price_t = \theta_0 + \theta_1 cost_t + \theta_2 tax_t + z_t$$

The construction of the IRFs remain unchanged.

6.1. The Commerce Commission market study approach

The Commission explored the possibility of asymmetric cost pass-through during the 2019 market study and found no evidence of asymmetry.[22] Although, we consider that the Error Correction model is best suited for this analysis, we replicated the earlier market study approach and applied it to new data. We summarise the model and results here.

It is worth noting that the model used in the market study is not typically used for asymmetric cost pass-through analysis. It is similar to models used for more general pass-through analysis. The Error Correction model is far more widely utilised for assessing asymmetric pass-through. The model used in the market study utilises a simple linear regression of price on cost and tax with two additional variables. The first is a dummy variable, equalling 1 if cost increased or stayed the same for that period and is labelled as cost increase. The second variable is an interaction between cost and the cost increase dummy. This variable measures how the effect of cost on price differs between a cost decrease and a cost increase. The regression equation is as follows.

$$Price_t = \beta_0 + \beta_1 cost_t + \beta_2 cost\ increase_t + \beta_3 (cost_t * cost\ increase_t) + \beta_4 tax_t + \varepsilon_t$$

Asymmetry is found if the interaction term is statistically significant. For example, a coefficient of -0.1 indicates that pass-through is 0.1 lower (for every cent of cost 0.1c less is seen in price) than when there is an increase in costs. This model utilises a regression with Driscoll-Kraay standard errors to adjust for the impacts of the temporal nature of the data.

This model has a few shortcomings. The largest issue comes in measuring the difference between cost pass-through with cost increases and decreases: it is possible to find a difference when, in fact, there is no asymmetry. This may occur if pass-through is equally lagged between cost increases and decreases, altering the relationship between costs and price upwards (for cost decreases) and downwards (for cost increases) in equal measure. This would appear as a difference between the two but, given an equal lag in pass-through, would not represent asymmetry. An additional issue may be the lack of interaction between time periods. All specifications of the model contain at most one lagged cost variable and no

22 The study also established that in theory there should be full cost pass-through to price. This was built on the assertions that demand was inelastic (did not change with price) and that suppliers had constant marginal costs (the cost per unit sold does not change as quantity changes).

lagged interaction variables. This limits the model as it can fail to fully account for the (possibly asymmetric) lagged impacts of previous cost changes over different weeks.

In addition, the model is not designed to have the scope to measure rocket and feather asymmetry. The basic version of this model measures absolute pass-through, a value that can be symmetric (total pass-through is the same between cost increases and decreases) even if rocket and feather pricing exists. As such, even if there is no asymmetry detected, there may be another form of asymmetry present.

Table 1 details the outputs from the analysis using the market study model, indicating that there is a difference in the pass-through of price onto cost for diesel but there is no statistically significant difference for Regular 91 or Premium 95.[23]

The results detail differences in the relationship between cost and price, given positive or negative cost changes at the time. This difference is most visible in Premium 95 and diesel, whose values are both statistically significant. For this analysis, asymmetry is found if there is a significant difference between the pass-through of a cost increase and cost decrease. The total rate of pass-through is inconsequential for this question. For diesel the pass-through rate decreases by 0.144 from a cost decrease to a cost increase. The differences for Regular 91 and Premium 95, however, are not as significant, with the decrease only being 0.06 for Regular 91 and 0.063 for Premium 95. Across all fuel types, there is a common trend that there is less cost passed through onto price with a cost increase than a cost decrease.

As noted above, however, this may not necessarily mean that asymmetry is present. Due to the lack of interactive lags (or change variables in the regression), the relationship between cost and price can change if a noticeable portion of cost changes are not passed onto cost contemporaneously (or with significant lag), as only part of a cost increase (or decrease) is passed on, creating the observed difference.

[23] It should be noted that for comparison to the market study the values are given in cents rather than dollars, meaning the intercept shift dummy should be divided by 100 to compare it to the market study.

6.2. Table

Table 1 – The Commerce Commission model output

Dependent variable: price	*Regular 91*	*Premium 95*	*Diesel*
Cost	*1.044**** *(0.0558)*	*1.050**** *(0.0567)*	*1.049**** *(0.0376)*
Cost increase indicator variable	*0.456* *(4.117)*	*0.931* *(4.269)*	*6.394**** *(2.582)*
*Cost * Cost increase indicator variable*	*-0.0696* *(0.0435)*	*-0.0781** *(0.0439)*	*-0.151**** *(0.0285)*
Tax	*0.771**** *(0.0966)*	*0.803**** *(0.105)*	*1.214**** *(0.225)*
Constant term	*54.23**** *(11.35)*	*63.39**** *(12.14)*	*40.44**** *(2.704)*
Observations	*356,106*	*267,132*	*386,077*

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

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