COPEC-CGL MERGER: AN EX-POST EMPIRICAL ASSESSMENT OF THE FNE'S DECISION

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Abstract: This article studies the acquisition of an independent service station (CGL) by COPEC to assess its impact on prices in the local gasoline retail market. I adopt a differences-in-differences strategy that compares the relevant geographic market affected by the increased market concentration due to the acquisition with geographic markets not affected by the merger within the region. I found evidence of a modest but statistically significant price increase in the stations affected by the acquisition, with average increases of approximately 0.7% for both gasoline 93 and 97. These findings are broadly consistent with the GUPPI calculations performed by the Chilean Competition Agency (FNE), although diesel price effects are slightly lower than the FNE's predictions. Overall, since both the FNE's GUPPI calculations and the empirical results indicate price increases below the 5% threshold—implying limited competitive concerns—the FNE's decision to approve the merger is justified based on this analysis.

1. Introduction

Ex-post assessments of merger effects offer competition authorities the opportunity to retrospectively evaluate previous merger decisions, examining whether their conclusions and final verdict unfolded as expected or could have been improved. Despite their importance, such evaluations are often hindered by data constraints and resource limitations.

In this article, I attempt to address this gap by examining a merger case within the retail gasoline market in Chile. Specifically, I analyse the acquisition of an independent service station (CGL) by the market's dominant player (COPEC) to evaluate its effects on prices in the local gasoline retail market (FNE F65-2016, Chile). My goal is to ascertain whether this merger resulted in increased consumer prices.

In the merger report, the Chilean Competition Authority's (FNE) competitive risk assessment partly relied on the Gross Upward Pricing Pressure Index (GUPPI) to estimate the potential effects of the merger on gasoline prices. The GUPPI calculations indicated possible price increases of 0.6% for Gasoline 93 and 0.9% for Gasoline 97 and Diesel, in the absence of efficiency gains. This analytical tool provides a preliminary proxy of the pricing pressure resulting from the merger, offering a benchmark for evaluating potential competitive risks. My empirical analysis aims to validate these predictions by comparing them against observed post-merger price changes, thereby assessing the effectiveness of the FNE's decision to approve the merger.

Recent concerns expressed by Chilean authorities regarding potential anticompetitive practices among gasoline retailers underscore the urgency of such investigations[1]. Moreover, the Chilean Competition Authority has flagged the Chilean gasoline market for its high concentration levels and significant entry barriers, amplifying the potential risks of post-merger unilateral and coordinated effects (TDLC, 2012).

To shed light on these issues, I employ a standard difference-in-differences (DiD) method to causally assess the impact of this merger on gasoline prices. This econometric approach enables us to compare the geographic market affected by the increased market concentration due to the acquisition with unaffected geographic markets within the region. By juxtaposing the FNE's estimates with my empirical findings, this study aims to provide a comprehensive assessment of the merger's competitive effects.

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[1]For recent examples, refer to "Test de precios predatorios en decisión de la FNE sobre estaciones de combustible" (CeCo, 2022), "La fallida consulta de la FNE en el mercado de combustibles líquidos" (CeCo, 2022), "La FNE, estación de servicios de Hualpén y empresa en crisis" (CeCo, 2020).

2.   The Merger

On April 18, 2016, *Compañía de Petróleos de Chile COPEC S.A.* (COPEC) and *Inmobiliaria y Administradora CGL Limitada* (CGL) notified the Chilean competition authority, the *Fiscalía Nacional Económica* (FNE), of COPEC's intention to acquire real estate assets and lease contract rights for a CGL's service station located on the Ancud-Castro route in Chiloé Island (Los Lagos Region).

At that time, CGL was a company with a network of 6 service stations, acquired as part of the divestment process ordered by the Supreme Court following the Shell-Terpel merger ([Rol N° 3993-2012](#)). COPEC, on the other hand, was the largest gasoline retailer in Chile, accounting for 50-60 % of national sales. In 2015, COPEC operated 627 service stations from Arica to Puerto Williams, covering virtually the entire Chilean territory. Additionally, COPEC owned 6 stations on Chiloé Island at the time of the merger.

In August 2016, the FNE initiated an investigation into the potential competitive effects of the merger, ultimately approving it in December 2016 after dismissing potential anti-competitive effects.

2.1.   Competition Agency Assessment

The FNE's appraisal of competition effects in the retail gasoline market partly relied GUPPI calculations. The GUPPI draws on a combination of two principal parameters – the diversion ratio and the gross profit margin earned on those diverted sales – to provide a prediction of the strength of upward pricing pressure.

GUPPI indicates the percentage increase in initial prices absent efficiencies. Since the GUPPI is always positive by construction, its use as a decision rule also requires an appropriate choice of threshold value to separate problematic from unproblematic cases. Typically, this threshold is set at 5 % or 10 % ([Moresi, 2010](#)). Exceeding these thresholds may signal potential harm to competition. Table 1 shows the FNE's GUPPI calculations for the Copec-CGL merger:

Table 1: *Gross Upward Pricing Pressure Index of target gas station (CGL). Source: FNE (2016)*

	Gasoline 93	Gasolines 97	Diesel
GUPPI-GCL Ltda.	*0.6 %*	*0.9 %*	*0.9 %*

The FNE found an upward pricing pressure of 0.6 % for Gasoline 93, and 0.9 % for both Gasoline 97 and Diesel, suggesting limited competitive concerns.

2.2. "First Reaction" vs Actual Merger Price Effects

The goal of this article is to conduct an ex-post merger evaluation to assess whether the FNE's decision, based on the GUPPI calculations, was indeed correct. However, while GUPPI is clearly related to firms' pricing incentives, it does not directly estimate the actual price effects.

First, GUPPI does not account for the possibility that non-merging competitors may adjust their prices as the market shifts to a new equilibrium. Thus, GUPPI can be seen primarily as a '*First Reaction*' indicator rather than a direct measure of final price effects. Second, the predicted price increases suggested by GUPPI might not necessarily be passed on to consumers. Firms could opt to absorb a significant portion of the potential price hike when setting their prices (Farrell and Shapiro, 2010). The post-merger price effect therefore often differs from the estimates of upward pricing pressure produced by the GUPPI.

The post-merger equilibrium price effects depend upon how upward pricing pressure (UPP) is passed through to consumers. Relevant literature has shown that if this pass-through can be observed or estimated from data, UPP provides a reasonable approximation of the true price effects (Miller et al, 2013). Even more, Miller, Remer, Ryan and Sheu (2017) provided evidence that UPPs and GUPPIs may provide a useful prediction of the price effect as long as the merger pass-through is incomplete (below 1).

In the context of retail gasoline markets, empirical evidence indicates that the pass-through rate is often below 0.5 or around that value (Apergis & Vouzavalis, 2018; Yilmazkuday, 2021). This suggests that GUPPI can serve as a reasonably accurate approximation of actual price effects. In light of this, comparing the treatment effects derived from my identification strategy against the GUPPI estimates provides a reasonable basis for evaluating the FNE's decision.

3. Data and Sample

The dataset used for my empirical strategy relies on a panel dataset sourced from *https://www.bencinaenlinea.cl*, an initiative by the Chilean Energy Ministry that offers comprehensive information on gas station prices nationwide. The fundamental unit of observation is weekly observed retail prices (in Chilean pesos or CLP) from each gas station. The dataset also includes relevant information such as the date of each price modification, the station's geo-location (coordinates), the brand affiliation of the station and gasoline type (93, 97 or Diesel).

To ensure the manageability and relevance of the dataset, I opted to streamline the observations by focusing solely on the latest posted price of each station within a given month, resulting in a reduced dataset comprising 61,114 observations —the original dataset encompasses 2,712,543

observations spanning from 2015 to 2021—. This approach allows for a more concise and targeted analysis.

Given that the merger under scrutiny occurred within the Region of Los Lagos, I restricted my observations to stations within this region. However, to maintain an adequate sample size, I expanded the scope to include stations from its neighbouring region, Los Ríos. Both regions are part of the Chilean South Macro-Zone, ensuring geographic coherence within the analysis. The final number of observations was 18,423 from 89 service stations[2].

4.   Empirical Strategy

4.1.   Identification Strategy

Applying a simple before-after comparison will lead to biased estimates of the merger effects, as observed price changes might stem from changes in demand, costs, or other factors unrelated to the merger itself. Therefore, I aim to compare price changes around the merger to a counterfactual scenario in which no merger took place. Based on ex-post merger evaluation literature (Dafny et al., 2012; Ashenfelter et al., 2015; Argentesi et al., 2021), I compare the geographical market in which both the acquirer (COPEC) and the target (CGL) operated in the pre-merger period to markets that did not experience a change in market concentration (control markets).

My identification strategy is based on the expectation that the competitive effects of the merger are likely to be more pronounced in the so-called overlap area between the merging parties than in non-overlap areas where the parties did not compete directly, as only in overlap areas did the intensity of competition change because of the merger. I can thus compare areas that experienced a change in market concentration (treated group) to markets without a pre-merger overlap (control group). This causal effect can be identified by employing a DiD methodology, comparing overlap and non-overlap areas to get the Average Treatment Effects on the Treated at the local level.

Another assumption that is implicitly here is that retail gasoline markets competition operates at the local level. Any comparison between treated and control areas will be able to identify merger treatment effects only if competition is, at least to some extent, local. Although this article does not provide evidence to support this, previous literature tends to suggest that retail gasoline market is local rather than national (Van Meerbeeck, 2003; Kvasnička et al., 2018).

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[2]For full access to the Python code and the analysis conducted in this study, please see the accompanying Jupyter Notebook available at https://dannyredel.github.io/posts/gasoline_merger_did/merger-report.html

4.2.   Relevant Geographical Market

The impact of COPEC's acquisition on the market structure around each gas station is measured as the change in the number of independent competing brands within a specific radius. However, determining the appropriate radius size is a critical consideration not to be underestimated.

The Chilean competition authority, in its merger report, defined the relevant geographical market as the entire Castro County/Commune. According to their assessment, this determination was based on jurisprudence, which tends to consider local or communal markets due to the difficulties and costs consumers face in traveling between gas stations, including time, convenience, and fuel expenses. Additionally, international jurisprudence has also noted that retail operators typically operate in local markets, monitoring competitor prices within a relatively limited radius, typically around 3 miles (approximately 5 kilometers), or based on travel isochrones of 10 minutes for urban areas and 20 minutes for rural areas (Case No. ME/3933/08). Consequently, I will adopt a 5 km radius to delineate the geographical relevant markets.

This selection process resulted in a total of 6 service stations falling within the defined overlap area, thus constituting the treated group. The remaining 150 stations outside this area will serve as the control group. Figure 1 provides a visual and interactive representation of the spatial distribution of these stations:
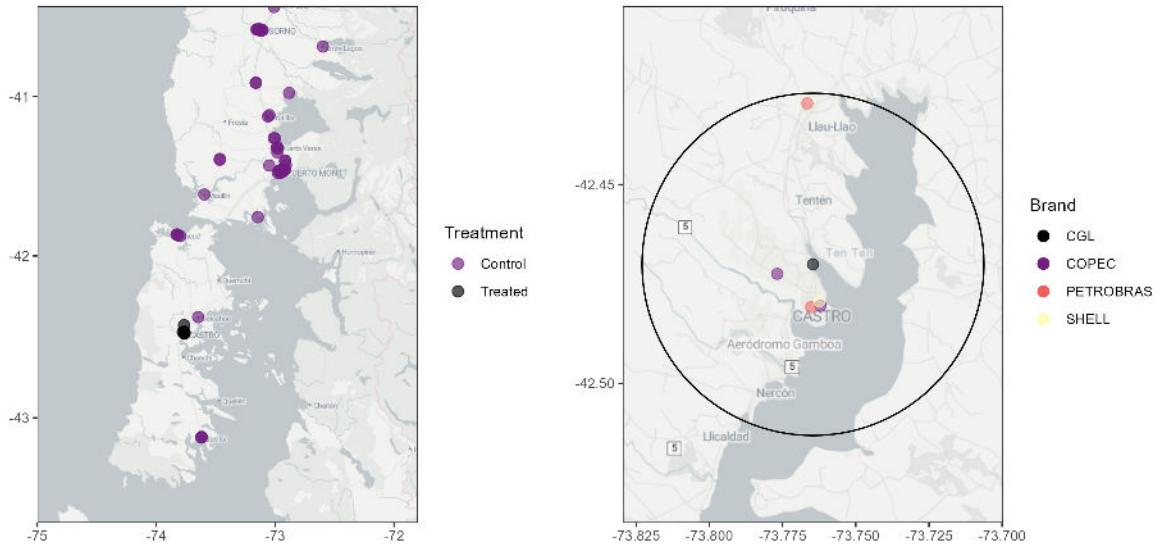

Figure 1: *Map with Treated Service Stations (Left) and Brand of Treated Stations (Right)*

4.3. Treatment Period

Regarding the treatment period, it's important to acknowledge that certain treated service stations ceased price postings during the interval between the merger approval (December 2016) and the beginning of operations under the re-branded identity (around January 2018). Consequently, observations within this transitional period are excluded from analysis, aligning the last pre-merger period with November 2016 and the first post-merger period with February 2018.

Furthermore, to ensure a balanced panel dataset, additional stations with irregular posting behaviour during the relevant study period are excluded. Following these adjustments, the dataset comprises 18,423 observations.

4.4. Summary Statistics

Table 2 offers summary statistics on both the treated and non-treated units within the dataset.

Table 2: Summary Statistics

	Pre-Merger		Post-Merger		
	Mean	**St. Dev.**	**Mean**	**St. Dev.**	**Mean Diff.**
Gasoline 93					
Mean Price - Treated	735.43	35.35	858.82	59.54	123.39***
Mean Price - Control	727.11	35.95	844.76	60.32	117.65***
Mean Diff.	8.32***		14.07***		
Gasoline 97					
Mean Price - Treated	815.41	39.25	918.21	57.62	102.80***
Mean Price - Control	805.78	40.18	902.88	58.54	97.11***
Mean Diff.	9.63***		15.32***		
Diesel					
Mean Price - Treated	515.26	44.54	639.78	60.37	124.14***
Mean Price - Control	501.13	44.30	622.78	61.38	121.65***
Mean Diff.	14.13***		16.63***		

The pattern observed in Table 2 is consistent across all fuel types —Gasoline 93, Gasoline 97, and Diesel—. For each fuel type, significant price changes are attributable to treatment, with mean

differences increasing after the merger. For example, in Gasoline 93, the treated group's mean price increased from $735.4 CLP to 858.8 CLP (a $123.4 CLP increase), while the control group's mean price rose from $727.1 to $844.8 CLP (a $117.7 CLP increase).

These consistent findings across different fuels validate the use of the DiD estimator to assess the merger's impact, as distinct increase in prices for treated groups relative to control groups are observed. Figure 2 illustrates the comparative trajectory of average gasoline prices per fuel type in the treated area against those in non-treated areas:
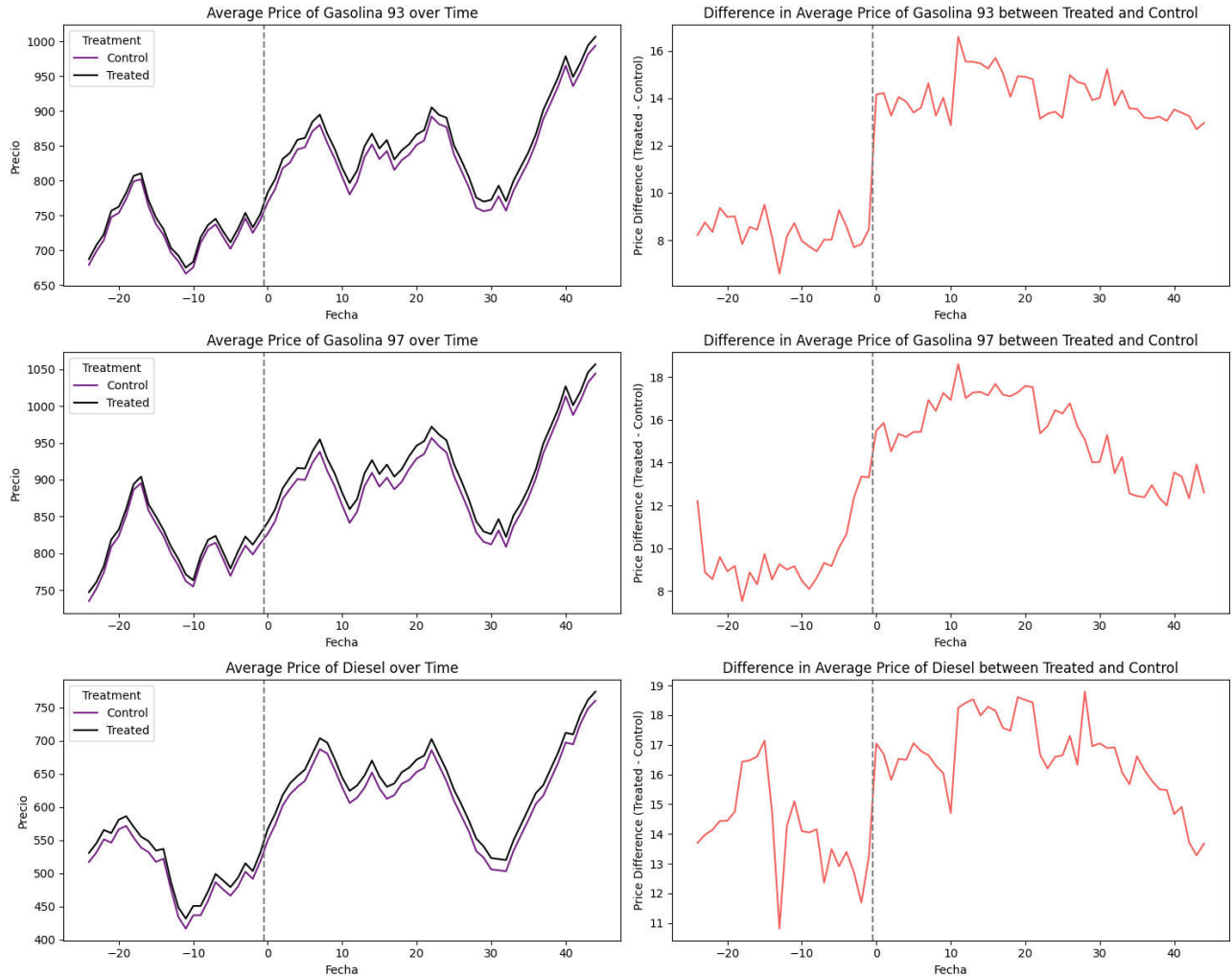

Figure 2: *Price Evolution in Combustibles, by Treatment*

Notably, the market's high price transparency is reflected in closely aligned pre-merger prices between treated and non-treated stations. However, this coherence is less pronounced in the case of Diesel, where price trends exhibit greater dispersion.

Nevertheless, this graphical assessment suggests that the crucial assumption of DiD methodology —the parallel trend assumption— appears to be upheld within my sample, particularly evident

for Gasoline 93 and 97. My event-study framework aims to further elucidate and quantify these patterns.

4.5. Empirical Model

I examined the impact of the merger on retail gasoline prices within affected local markets using a DiD framework that compares the price changes in a selection of stations located in overlap areas with the change in the same outcome variable in other stations from the non-overlap areas, both before and after the merger. My baseline specification takes the following form:

$$P_{it} = \beta \times Treat_i \times \mathbf{1}[t - t_0^* \geq 0] + \gamma_t + \lambda_i + \varepsilon_{it} \tag{1}$$

where the outcome variable, P_{it}, denotes the price of service station i in year-month t. The treatment variable, $Treat_i$, takes the value of 1 if station i is located within the 5 kilometers of radius distance towards the target firm. The post-period indicator variable, $\mathbf{1}[t - t_0^* \geq 0]$, equals 1 if period t belongs to the post-merger period (i.e., after January 2018) whose starting period is t_0^*, and 0 otherwise. Year-month and unit fixed effects are captured by γ_t and λ_i, respectively. The coefficient of interest is β, which measures the average treatment effect of the merger. It identifies the additional variation in prices experienced by the stations in overlap areas compared to the control stations after the merger took place.

Under certain assumptions, parameter β captures the causal effect of the treatment on the outcome. In this context, these effects are primarily identified by comparing units in the treated areas and units in no-treated areas, before and after the merger phase. The crucial identifying assumption is the so-called parallel trends assumption of a DiD model: that absent the merger, the treated service stations would have experienced the same outcome *trend* as the control stations.

In addition, I also report estimates from a more flexible specification that allows the coefficient to vary by the relative periods after the merger by estimating the following equation:

$$P_{it} = \gamma_t + \lambda_i + \sum_h (\beta_h \times D_{it}^h) + \varepsilon_{it} \tag{2}$$

Where D_{it}^h is an indicator for h periods relative to i's initial treatment, to consider surrounding the treatment period. Because I normalize the coefficient on the periods just prior to the merger announcement to zero (i.e., $\beta_{-1} = 0$), each coefficient of β_h can be interpreted as the price change in treated stations relative to non-treated stations after h periods of the merger, with all of the

β_h's being estimated relative to the omitted year (i.e., $h = -1$).

Using this flexible model has two advantages. First, I can visually test the key identifying assumption, which is the parallel-trends assumption: absent the acquisition, the prices between overlap and non-overlap areas would have evolved in parallel. Although this assumption is fundamentally untestable, plotting the β_h's of pre-periods (i.e., β_{-8} to β_{-2}) can provide visual evidence. Second, this event-study allows the assessment of the time-evolving effects of the merger. This flexible specification enables me to capture such time-varying effects.

5. Main Effects

5.1. Two-Way Fixed Effects Results

Table 3 reports the baseline results from estimating the specification described in Equation 1 on Gasoline 93, 97 and Diesel prices, respectively:

Table 3: *Main Results - Merger Effects on Service Station Prices, by Fuel Type*

	Dependent Variable: Price		
	Gas 93	**Gas 97**	**Diesel**
Post × Treat	5.747***	5.690***	2.497*
	(0.599)	(0.626)	(0.977)
ATT (%)	0.780	0.700	0.490
	(0.160)	(0.151)	(0.372)
Unit Fixed Effect	Yes	Yes	Yes
Time Fixed Effect	Yes	Yes	Yes
Adjusted R^2	0.99	0.99	0.99
Observations	6.141	6.141	6.141

Notes: This table reports the baseline results. The dependent variable is the price of service stations. All regressions control for unit and period fixed effects, as well as controls. Clustered Standard errors by service station are in parentheses.
$+p < 0,1$, $*p < 0,05$, $**p < 0,01$, $***p < 0,001$.

The estimated average effect (ATT) in all these cases suggests that the merger caused a statistically significant average increase in price in overlap areas by around $6 Chilean pesos (CLP) for Gasoline 93 and 97 and around $2.5 CLP for Diesel. These price increases correspond to 0.5-0.8 % (Row

2), indicating that service stations have, on average, raised prices as a result of the merger. These price effects are broadly consistent with the GUPPI calculations performed by the FNE (see Table 1), particularly for Gasoline 93 and 97 (0.6 % and 0.9 %, respectively), though they are slightly lower for Diesel compared to the 0.9 % calculated by the competition agency.

5.2. Event-Study Results

I now estimate the event-study specification outlined in Equation 2 with the period before the merger as the reference period. Figure 3 shows the estimated coefficients and the corresponding 95 % confidence intervals, with the vertical dotted line marking the beginning of the post-merger period (February 2018):
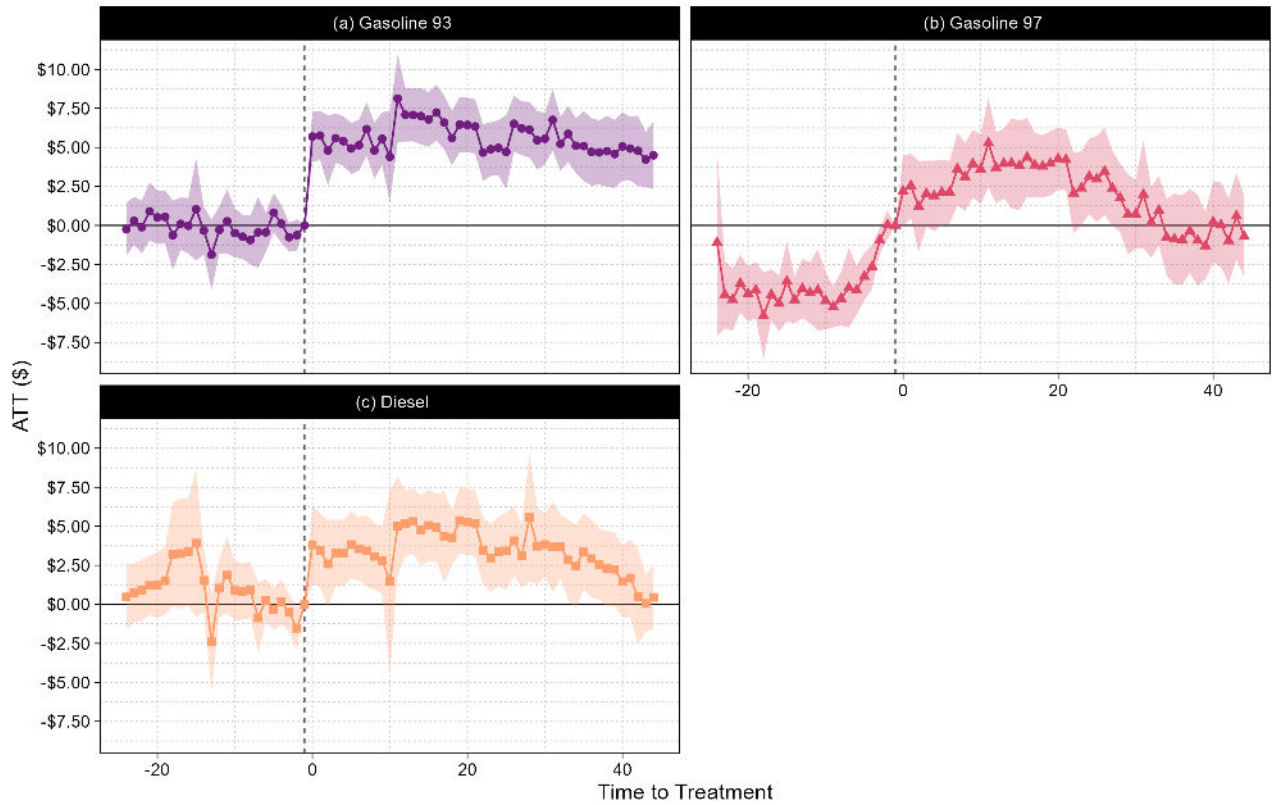

Figure 3: *Event-Study Results, by Fuel Type*

First, the visual evidence supports that the parallel trend assumption holds for Gasoline 93 and Diesel, which is the main identifying assumption to interpret the effects as causal. In these models, the estimated coefficients for the pre-treatment period are close to zero and statistically insignificant. However, for Gasoline 97, there appear to be anticipation effects, with service stations seemingly adjusting their behaviour in anticipation of participating in the treatment before the

intervention actually happened. Interestingly, the parallel trends assumption holds until August 2016, coinciding with the initiation of the FNE's investigation[3].

After the merger, I found that service station prices increased significantly, confirming my baseline regression results. The effect of the merger on prices materializes immediately after the re-opening. It's worth noting that the results for Gasoline 93 are particularly clear in Figure 3a, with treatment effects exhibiting persistence or stability post-merger. Conversely, in the case of Gasoline 97 (Figure 3b), the treatment effects tend to diminish after approximately 20 months. Similar downward trends are observed for diesel prices (Figure 3c).

6. Discussion

6.1. Effect Size and Competitive Concerns

My empirical analysis shows an increase in gasoline prices after the acquisition of CGL. For example, this implies that a consumer with a 40-liter tank of Gasoline 93, facing an increase of $6 CLP per liter, would incur an additional cost of $240 CLP in the first week following the merger, compared to what they would have spent in the absence of the merger.

But, how large are these effects? Previous research in the retail gasoline market suggests that my findings are in line with earlier studies. For instance, Lagos (2018) studied the merger between two large Chilean gasoline retailers, finding effects on margins between 0.5 % to 4 %, depending on the specification and the location of gas stations. Similarly, Pennerstorfer and Weiss (2013) utilized a DiD framework to evaluate the price impact of BP's acquisition of Aral stations in Austria in 2003, finding price increases of approximately 0.3 %. Houde (2012) also identified post-merger price effects of around 0.7 %, but 4–11 percent increases in average retail margins. These comparisons suggest that the effects observed in this study are comparable to those reported in the literature.

How do these effects correlate with antitrust enforcement? Does these results justify FNE's merger decision to approve it? As mentioned, mergers are unlikely to raise significant unilateral effects concerns if the GUPPI is proportionately small. In practice, that amount is often considered to be less than 5 % (Moresi, 2010). In this case, both the FNE's GUPPI calculation and my empirical findings fall well below this 5 % standard, suggesting limited competitive concerns. Therefore, the FNE's decision to approve the merger appears to have been justified based on these findings.

Given the consistent evidence of similar price effects across various cases within the retail gaso-

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[3]When I re-run the event study by adjusting the periods over which parallel trends hold, I find slightly higher estimates. However, the conclusions remain consistent with the baseline results. For space reasons, these additional results are not included here.

line markets, a relevant question arises: should we lower the 5 % threshold for mergers in this industry? From a competition policy perspective, reducing the threshold might help keep prices low by preventing even modest price increases from mergers. However, this comes with a trade-off. Lowering the threshold would increase the number of merger cases for competition authorities to review, potentially straining resources and affecting the quality of assessments. This could result in a higher prevalence of Type I errors, where procompetitive mergers are mistakenly prohibited. Bhattacharya, Illanes, and Stillerman (2023) caution that while modest increases in stringency may reduce prices, they also substantially increase the agency burden, nearly tripling the number of mergers agencies must examine.

6.2.   Countervailing Efficiencies

Not only do these findings suggest that the observed effects are too low to raise competitive concerns, but they also do not account for potential pro-competitive effects, such as efficiency gains, which could offset any negative impacts. For example, if competition occurs in dimensions other than price, the effects of mergers on consumers may well be more complex.

In FNE's report (FNE F65-2016, Chile), both the merging parties and other industry stakeholders argued that service differentiation is a critical factor in the retail gasoline market within the Commune of Castro. They noted that fuel prices are generally similar across stations, making the quality and variety of services the key competitive differentiator. COPEC also indicated that its interest in acquiring CGL's service station was due to its larger size, which would allow COPEC to offer enhanced and additional services compared to their existing, smaller stations in Castro. This expansion was presented as a competitive benefit for consumers.

The data available does not permit a more detailed examination of competitive variables such as service quality. While there is evidence of no decrease in the number of convenient stores, toilets and other services in the relevant geographical market, more granulated data would be needed in order to better assess these efficiency considerations. In any case, the modest price effects observed, in conjunction with potential efficiency gains, provide further support for the FNE's decision to approve the merger.

7.   Conclusion

In this study, I examined the impact of the COPEC-CGL acquisition on retail gasoline prices within affected local markets using a DiD framework. This approach compares the price changes in stations located in overlap areas—where both firms previously operated—with the changes in stations from non-overlap areas, both before and after the merger. This strategy allowed me to

identify and estimate the causal impact of the merger by isolating the effect of increased market concentration from other factors that might influence price changes.

The empirical analysis revealed that the merger led to statistically significant yet modest price increases: approximately 0.7 % for Gasoline 93 and 97, and around 0.5 % for Diesel. These results are consistent with the FNE's GUPPI calculations, which predicted upward price pressures of 0.6 % for Gasoline 93 and 0.9 % for Gasoline 97 and Diesel. Both the GUPPI estimates and my empirical findings fall below the 5 % threshold commonly used to flag mergers that pose substantial competitive risks. These price increases, while notable, are insufficient to warrant serious concern about anti-competitive behaviour, thereby supporting the FNE's decision to approve the merger.

Furthermore, this analysis acknowledges that while price effects are a critical aspect of merger evaluation, they do not capture the full spectrum of potential competitive impacts. Service quality and variety are significant competitive factors in the retail gasoline market. The merger's potential to enhance service offerings could represent an efficiency gain that offsets the modest price increases observed. Although my data does not allow for a granular analysis of service quality, the evidence of no reduction in the number of services post-merger aligns with the argument for potential efficiency improvements. Consequently, this broader perspective suggests that the FNE's approval of the merger was not only justified by the low price effects, but also reasonable when considering the potential benefits to service quality.

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