Pre-print version. Accepted at ENERGY POLICY

Price coordination in the Spanish oil market: the Monday effect

Abstract

Spanish premium oil operators have been accused of coordinating gasoline price cuts on Mondays. The objective of this practice, known as the "Monday effect" was to lower the official prices of automotive fuels - that was collected on Mondays- so as Spain was not at the top of the European price ranking. This behavior presumably ceased in May 2013 when Government began to consider the average prices of the entire week instead of Mondays prices. In order to test whether this anticompetitive behavior existed and ceased after the change in the data collection methodology, we employ a novel database that includes retail prices for all petrol stations in Spain in the period 2012-2013. Using a difference-in-difference estimator, we exploit this regulatory change to econometrically identify and confirm that: *i)* the three main companies, with 70% of the market share, have systematically established lower prices on Mondays, and that this is unjustified by either cost or demand; *ii)* this price reduction was small during 2012, but increased significantly in the first half of 2013. *iii)* following the change in the collection of price data by the government, the average Monday effect 'disappeared' from the Spanish gasoline market. Our results highlight the price coordination capacity of dominant oil operators in Spain and suggest that authorities that monitor cartels should be much more active in promoting competition in this sector, for example, by promoting the entry of low-cost or independent stations and/or by being particularly alert to evidence of collusive behavior. Likewise, this coordination capacity must be taken into account when evaluating mergers in this sector and/or imposing fines.

Keywords: Petrol; Antitrust; Coordination, Monday effect.

J.E.L. Codes: L13, L59, L71.

1. Introduction

Historically, the global oil market has lacked effective competition. This is due to: firstly, the demand characteristics of this market, that enhances coordinated behavior (like price inelasticity); and secondly, the supply side (low product differentiation; market share stability; high levels of concentration,…) [1]. Regarding the latter, since the wholesale market's objective is to increase retail consumers, a lot of anticompetitive practices can be detailed. Firstly, the birth of the OPEC cartel is a 'textbook example' of how a competitive market must not operate. Starting from this point, the outcome has been: allegations of collusive behavior (see Canada Competition Bureau,[2] cases by Office of Fair Trading, 1998; Wang, 2008); an asymmetric response to upstream cost shocks (see the seminal paper by Bacon, 1991); and predatory pricing (see Anderson and Johnson, 1999 for an analysis about sale-below-cost laws and retail gasoline prices), etc.

Since Spain liberalized its retail petrol market, investigations conducted by the antitrust authorities and sector regulators, supported by academic findings, show that effective competition levels have remained very low (Perdiguero, 2010 and 2012).[3] However, as the 2012 report published by the *Comisión Nacional de la Competencia* (the Spanish National Antitrust Authority at that moment, henceforth the CNC) notes, this low level of competition has not only been restricted to the retail sector, but characterizes all levels in the production chain. Hence, it can be inferred that the market prices reflect the high degree of concentration that the oil companies, especially the wholesalers, enjoy.

This paper analyzes what we consider to be a new coordination practice in this market: the firms' reaction to public concern. In recent years the media have reported the rising retail price of petrol in Spain, especially relative to price levels in other European Union countries,

[1] See Ivaldi et al (2003).
[2] http://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/00235.html
[3] See CNC (2012a); CNE (2013a; 2013b) and previous inquiries. For academic literature, see section 2.

and they have also noted the increase in oil firms' profit margins, despite a fall in demand and the economic crisis.[4] One of the main indicators noted in the press has been Spain's high position in the European price ranking, a ranking that the European Commission compiles every week in its publication *Oil Bulletin*.[5]

To build this ranking, each country decides how to collect and send prices to the European Commission. In the case of Spain, the government decided that it would send the average price fixed on Monday of each week. The former Spanish energy regulator (CNE, 2013a; and CNE, 2013b) suspected that the leading companies in the sector would take advantage of this fact to significantly reduce the price on Mondays, and later increase it for the remainder of the week, in order to improve Spain's position in the ranking.

The realization of this pricing strategy meant that the companies had some (great) capacity to coordinate. Given this possibility, the government decided that, starting on May 13, 2013, the average price for the whole week would be sent and not the price set on a Monday.

Starting from this change in data collection, the purpose of the article is to obtain empirical evidence about whether there is any agreement between companies in the Spanish oil market to establish significantly lower prices on Mondays; and we also test how this price strategy has functioned following the change in retail price collection methodology.

Our results confirm that the leading firms coordinated to establish significantly lower prices on Mondays during the period where those prices were used to configure the *Oil Bulletin* ranking, and that this price strategy effectively disappears when the method of collecting prices is modified.

While a number of studies have identified the cyclical behavior of gasoline prices in retail markets, they have generally also pointed to the existence of a certain level of retail

[4] See Spanish newspaper "El País", 17/05/2013. *Las petroleras aumentan en un 31% los márgenes sobre las gasolinas desde enero ["Oil company petrol profit margins up 31% since January" (authors' translation)]*.
[5] http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm

competition (ACCC, 2007; Foros and Steen, 2013). However, to the best of our knowledge, the literature has not yet reported on a case similar to the one documented here, which, if confirmed, would provide further evidence of the lack of competition in the Spanish retail petrol market. Our aim therefore is to corroborate what has come to be referred to as the 'Monday effect'.

To do so, and following on from a review of the literature and the Spanish market (section 2), we present the empirical strategy and our daily database of petrol retail prices in Spain for the period affected by the 'Monday effect' (January 2012-December 2013, in section 3). The econometric approach implemented and the results are presented in section 4 and conclusions in section 5: the 'Monday effect' existed and it has become a new indicator of coordination in this retail petrol market in Spain.

2. The evolution of the Spanish petrol market: an academic perspective

The Spanish petrol market has undergone a major restructuring process having been transformed from a state monopoly run by CAMPSA (now Repsol) to a completely free market in less than two decades (see Perdiguero and Borrell, 2007; or more recently Perdiguero, 2010 and 2012). Currently, all the segments that comprise the industry (refining, transportation, distribution and retailing) are fully liberalized. However, despite liberalization, the market remains extremely concentrated, both horizontally and vertically. Indeed, at the retail level many stations are vertically integrated with companies that have refining capacity in Spain (Repsol, Cepsa and BP), while the others operate under exclusive contracts, which means the long-term indirect fixing of the final price, given that these contracts include price recommendations (Jiménez and Perdiguero, 2011).

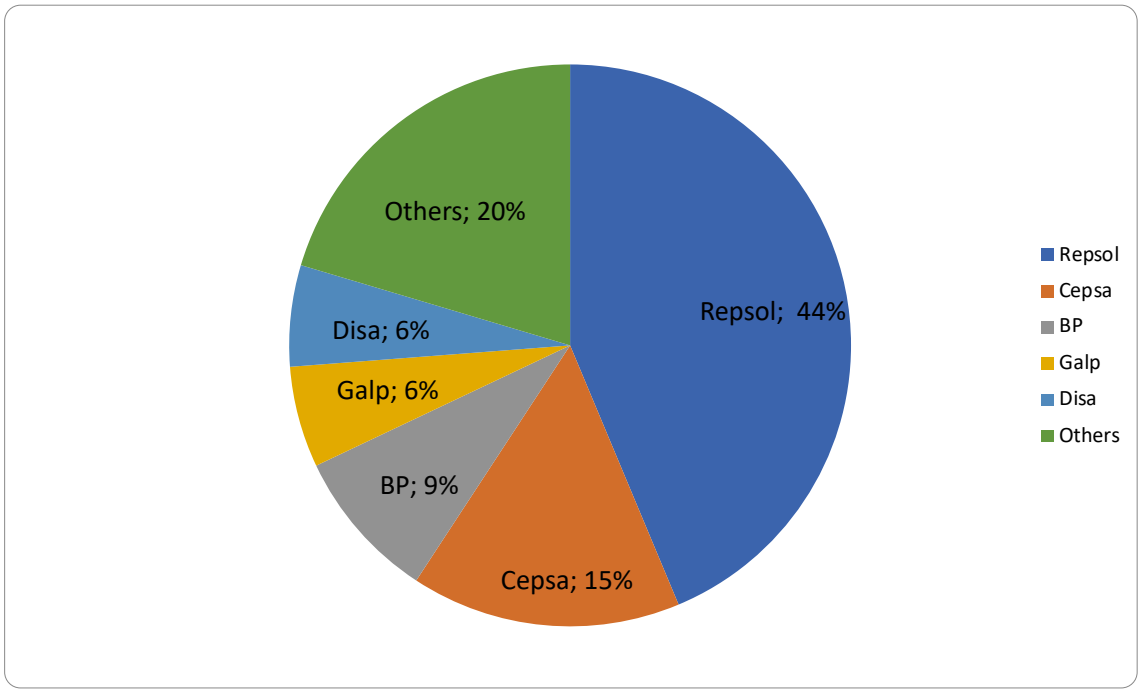
These problems have already been identified by the CNC (2010) in a report that concluded that the high level of vertical integration in Spain's petrol market meant pricing decisions

were being taken by a small number of agents (i.e., the major oil companies), which reduced the level of competition in the market and caused price increases and price uniformity. In 2012, the Ministry of Industry requested a market report from the CNC, prompted by the growing media coverage of retail price levels in the Spanish market. This report arrived at a clear conclusion: there is no competition at any level in the production chain (see CNC, 2012b).

This same report noted Spain's high petrol market concentration as a possible reason for non-competitive behavior. The report confirmed that the Spanish petrol retail market has a Herfindahl-Hirschman Index of 4,531 points, which is far from the 3,661 points of France, the 1,749 points of Italy, the 1,702 points in Germany or the UK's 1,313.

But it is not only the refining segment that is highly concentrated. The following graph illustrates the market share by sales of each of the companies operating in the Spanish market during the period analyzed. As shown, Repsol has a 45% market share, and the three companies with refining capacity in the market (Repsol, Cepsa and BP) have a 70% market share (CNC, 2012b). Therefore, Spain has a highly concentrated market, which may explain the possible existence of anticompetitive behavior. In fact, in a recent paper Bello et al (2018) show like gross margins increase significantly from 2008, due to high market power of large companies in this market.

Figure 1: Market share in Spain's retail gasoline market (2012)



Source: CNC (2012b)

Various studies in the literature, around the world[6] as well as in Spain, have tackled the question as to whether prices reflect a competitive or a collusive market. In Spain, academic papers since the liberalization highlight the following: first, some barriers remain, like the monopoly enjoyed by the logistics company CLH[7] (Contín and Huerta, 2001); second, branded retailers have charged the highest prices (Bello and Cavero, 2008); third, retail competition is encouraged solely by independent retailers (Bello and Contín, 2010; Jiménez and Perdiguero, 2012); and finally, prices are closer to reflecting a monopoly rather than a competitive market (Perdiguero and Jiménez, 2009; Perdiguero, 2010).

However, to date, no study has examined cyclical price behavior in Spain. Papers conducted in line with the theory developed by Maskin and Tirole (1988) demonstrate that price cycles must have an explanation. But, why do price cycles occur? Various ideas have been proposed, but the most important is the Edgeworth cycle theory (see Eckert, 2013, for a survey). In

[6] See Eckert (2013) for a survey of empirical approaches applied to this sector.
[7] CLH (*Compañía Logística de Hidrocarburos*) is Spain's only oil product transportation and storage firm. This monopolistic position, coupled with the freedom to establish prices, contributes to the inefficient operation of the country's petrol market.

this price cycle equilibrium, prices are driven down to marginal cost, at which level the business is unsustainable without a price rise. Eventually, a firm will raise its price to the monopoly price level. This cycle is then repeated over time (ACCC, 2007, pp. 350). Recently it has been conjectured that this cyclical behavior is related to a collusive outcome.

Since Castanias and Johnson's (1993) seminal paper for a US city, a considerable number of empirical studies have explored the nature of Edgeworth cycles in retail gasoline markets in different geographical markets: Canada (Noel, 2007a; Noel, 2007b); the United States (Lewis, 2009; Doyle et al, 2010); Australia (ACCC, 2007; Wang, 2009); and Norway (Foros and Steen, 2013).

The latter drew on daily prices from a sample of Norwegian retail petrol stations for the period 2003-2006 to analyze not only weekly but also intra-daily price behavior. Their empirical strategy yielded two conclusions: first, that leading firms are able to systematically increase prices each Monday, which served as the starting point for cyclical behavior. The authors attribute this outcome to high vertical integration in this market. Second, they further show how from noon on Mondays, stations change their initial prices to the recommended maximum prices, which is an indicator of the weak level of competition. In fact, thanks to an earlier version of this article,[8] the Norwegian Competition Authority commenced proceedings against companies (see NCA, 2010).

Valadkhani (2013), on the other hand, addresses the seasonal patterns in daily prices in the Australian retail petrol market. The author analyzes whether there are any daily idiosyncrasies in petrol prices due to the purchasing patterns of consumers and the demand for petrol. The author collected average daily retail prices of unleaded petrol for 114 cities across Australia and he estimated a daily price equation. This estimation yielded two main conclusions: first,

[8] Foros, O and Steen, F. 2008. Gasoline prices jump on Mondays: an outcome of aggressive competition?, CEPR DP6783.

that there is a daily effect in 16 of the 114 cities (Sundays or Tuesdays being the cheapest days of the week); and, second, that this effect occurs only in capital cities or major regional centers.

Although no such study has been undertaken in Spain, two public reports by the CNE have examined the market's 'suspected' cyclical price behavior: the so-called 'Monday effect' (CNE, 2013a; CNE, 2013b). These reports studied price differences for the three-day period Sunday-Monday-Tuesday using univariate analysis and drew a number of important conclusions: first, that the price of oil does not justify a systematic price drop on Mondays, especially because international petrol markets do not operate at weekends. Second, the price differences between Sundays and Mondays became negative, and more notably so, in the second semester of 2012 (around €-0.7 cents). Third, a regional analysis by brand showed that this effect was more intense in those regions where the leader in Spain's petrol market enjoyed the highest market share.

3. Data and empirical strategy

Information about retail petrol station prices in Spain is public, and it is also available on a daily basis. However information on previous days' prices are not public available.[9] We therefore downloaded all daily prices from the Ministry of Energy, Tourism and Trade's website from 1 January 2012 to 31 December 2013, the period when this effect occured. Our final database contains prices for petrol 95 octane from Monday to Friday and holds more than three million observations[10]. The prices used are the final prices after taxes. Taxes have not been modified in a heterogeneous way between the different regions of Spain during this

[9] See https://geoportalgasolineras.es/#/Inicio

[10] We do not have information for Saturdays and Sundays since they were collected manually by researchers during their workday. However, with a subsample for the city of Barcelona, with information for the weekend, the results do not change significantly.

period, so the results using prices without taxes do not change at all. The website also facilitates the geographical coordinates of the stations and their brands.

Our empirical strategy involves two control groups: petrol stations on the Canary Islands (a region of Spain) and those that are unbranded or operated by independent retailers. These control groups were not chosen *ad hoc*. Regarding the former, the European Commission's *Oil Bulletin* explains in its research methodology that petrol stations located in this archipelago are not included in their statistical information because of the different tax systems applied in mainland Spain and this region. Therefore, as the same companies operate in both markets, but one is not influenced by the European price ranking, we selected this as a control group. We hypothesize that the petrol stations located in the Canary Islands do not follow the strategy of setting lower prices on Mondays for this reason.

Regarding the latter, this second control group is used by other papers, as Jiménez and Perdiguero (2012), who conclude that only independent retailers exert some competitive forces in this market.[11] For this reason, we differentiate the petrol stations by brand to check whether the petrol stations owned by supermarket chains (e.g. Carrefour, Eroski, etc.), user cooperatives, low cost petrol stations and independent retailers in mainland Spain, follow a different pattern in their cyclical price behavior, and do not set lower prices on Monday.

Table 1 shows the descriptive statistics for our database. We include the date of the change of collection data in Spain (May, 13th, 2013; see introduction) and test changes after that.

[11] This outcome was also obtained by Zimmerman (2012) for the US market.

Table 1: Average prices (all petrol stations, in €). Petrol 95

	2012	2013	2013 (Before 13/5/2013)	2013 (After 13/5/2013)
Prices on Tuesdays to Fridays	1.3474 (0.0898)	1.3551 (0.0789)	1.3655 (0.0768)	1.3489 (0.0794)
Prices on Mondays	1.3433 (0.0888)	1.3494 (0.0774)	1.3564 (0.0764)	1.3454 (0.0777)
Price difference (Mondays minus the rest)	0.0041	0.0057	0.0091	0.0035
t-test (H_o: price difference equal to 0)	22.9367*** (0.0000)	38.1745*** (0.0000)	37.6971*** (0.0000)	18.6343*** (0.0000)

Source: Own elaboration. Standard deviation in brackets. (*) t-test shows statistical significance.

As Table 1 shows, Monday prices were lower than those charged, on average, on the other days of the working week in 2012 and 2013. The main price differential was recorded in in the first months of 2013, when it almost reached €1 cent (0,01€). As can be seen, the *t* statistic indicates that the price difference between Monday and the other working days shows statistical significance in all cases.

Prices set by the different companies in the mainland are included in Table 2. These prices follow the expected pattern: the main companies set higher prices, according to their market share, while independent gas stations, user cooperatives, low cost petrol stations and those linked to supermarket chains, set significantly lower prices.

Table 2: Average prices by company (Mainland, in €). Petrol 95

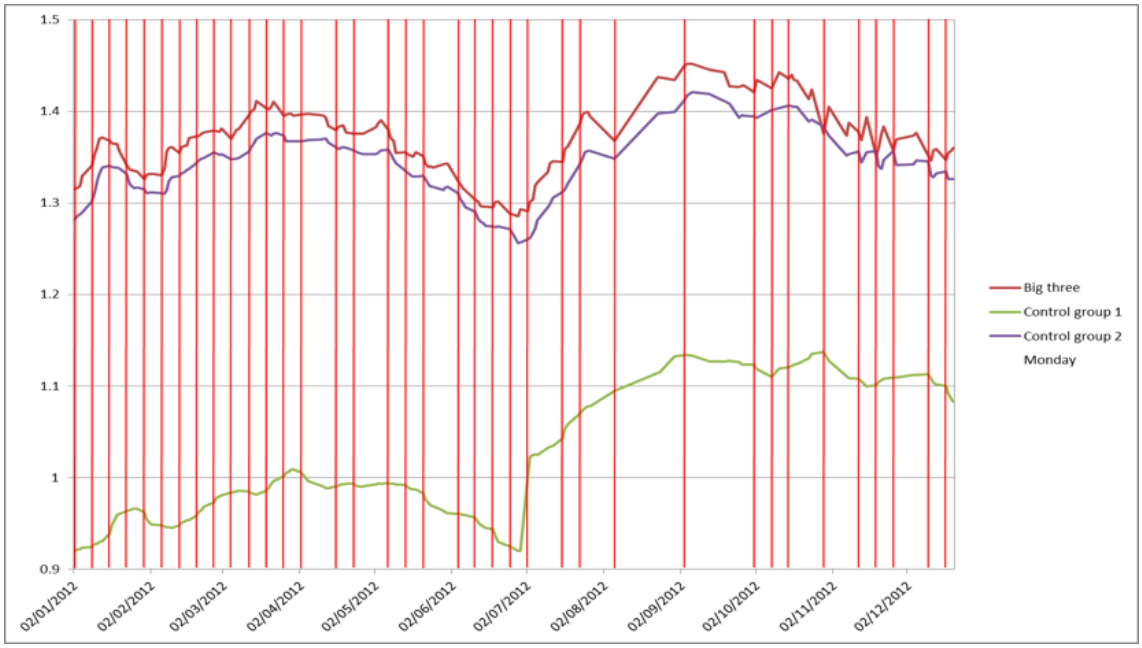
Company	2012	2013	2013 (Before 13/5/2013)	2013 (After 13/5/2013)
Repsol	1.3685	1.3779	1.3843	1.3741
Cepsa	1.3652	1.3745	1.3812	1.3705
BP	1.3721	1.3765	1.3852	1.3714
Galp	1.3671	1.3697	1.3800	1.3637
DISA	1.3572	1.3628	1.3720	1.3574
Indep	1.3550	1.3551	1.3683	1.3475
Supers	1.3337	1.3291	1.3475	1.3185
Low Cost	1.3527	1.3222	1.3471	1.3115
Coop	1.3237	1.3250	1.3413	1.3159

Source: Own elaboration.

The following two figures depict the evolution of prices for three groups of companies: 1) the three main companies operating in Spain (Repsol, Cepsa and BP) and the 'main suspects' of operating a cooperative strategy; 2) the gas stations located in the Canary Islands, where despite the same companies operating, we do not expect such behavior, since the these gas stations' information is not used to configure the European price ranking (control group 1 in our figure); 3) the group of companies that the economic literature has observed generates greater competitive pressure (maverick firms[12]) - in our case the independent operators, the low cost companies, the user cooperatives and gas stations owned by supermarket chains (control group 2 in our figure).

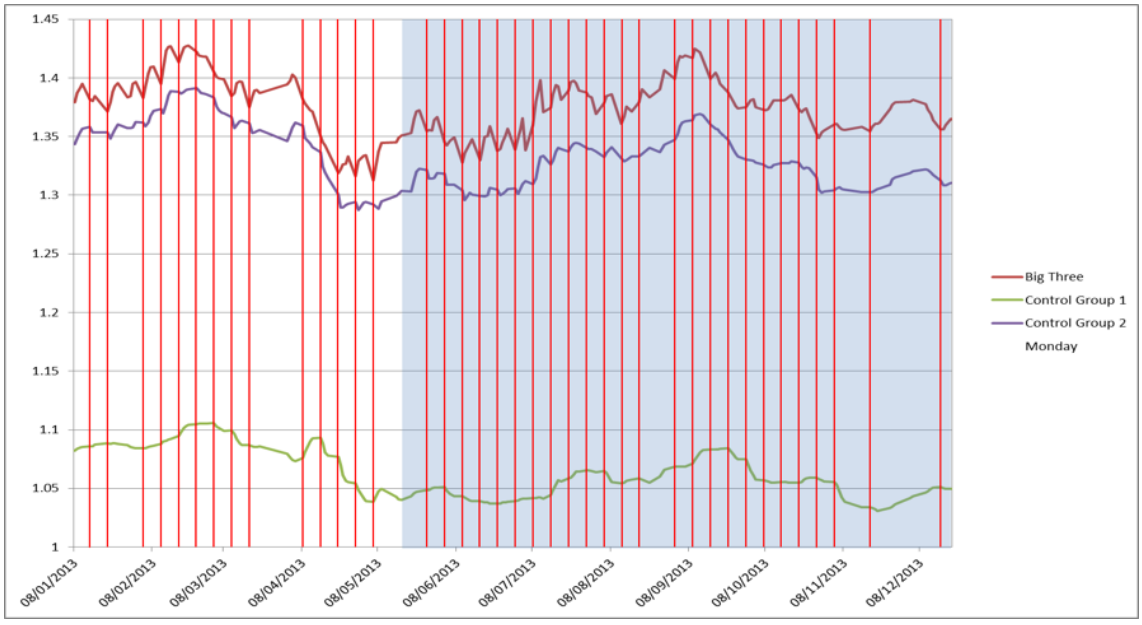
[12] See Eckert and West, 2004a; and Eckert and West, 2004b. In this last paper a maverick firm is defined as "a firm whose market share is very sensitive to its price relative to that of competitors, whose marginal cost is substantially below that of competitors, or who has strong incentives to increase volume sold."

Figure 2A. Evolution of Petrol95 price in 2012[13]



Source: Own elaboration

Figure 2B. Evolution on Petrol95 price in 2013



Source: Own elaboration

[13] The vertical red lines correspond to Mondays. The distance between them is not homogeneous since there is no information available for all Mondays during this period. The shaded area in figure 2B corresponds to the period in which the data collection methodology was modified by the Ministry of Industry, Energy and Tourism (13/05/2013).

As can be seen in the two figures above, the prices of the three main companies do seem to present an evolution in line with the 'Monday effect', because a significant decrease in prices occurs on Mondays. This behavior seems to decrease in the last period of 2013 (shaded area of figure 2b), which corresponds with the period in which the Spanish government decided to modify the methodology of data collection, going from sending the prices fixed on Mondays to an average of the whole week. As regards the evolution of prices in the Canary Islands (control group 1), at least as far as can be seen, there were no significant price drops on Mondays; while in the case of the companies within the control group 2, price behavior is much less clear.

Even though the previous figures offer us some information, an econometric approach is required to identify a more robust relationship. To this end, in the following section we estimate different econometric specifications showing the relationship between the different days of the week and the price of gasoline charged by petrol stations.

4. Estimations and results

Our main empirical strategy is to determine whether prices differ depending on the day of the week. In order to test this effect on the price of petrol 95 octane, we adopt the following general model (as used in Valadkhani, 2013)

$$p_{it} = \beta_0 + \beta_1 Tu_i + \beta_2 We_i + \beta_3 Th_i + \beta_4 Fr_i + \beta_5 Brent_{t-1} + \beta_6 Time_t + \varepsilon_{it} \qquad [1]$$

where p_{it} is the retail price of petrol 95 (euros per liter) at petrol station i on day t. Tu_i, We_i, Th_i and Fr_i are binary variables that represent the day of the week, taking the value of one on the respective day and zero otherwise. ε_{it} is the error term. As we include data for Monday

to Friday (note, no data are available for weekend retail prices),[14] our estimations exclude one day as a benchmark or reference day. We also include the price of the barrel of Brent in the previous period[15], as well as a trend variable that takes value 1 for the first day of the sample and increases (*Time*). With these two variables we control for any cost variation that may have occurred during our period of analysis.[16]

If the 'Monday effect' exists then the prices charged during the rest of the week should be higher than the Monday price; however, if the price charged on just one working day is equal to or less than Monday's price we can discard the existence of the 'Monday effect'.

This empirical approach is estimated by ordinary least squares. Given the possible existence of autocorrelation we have implemented the test proposed by Wooldridge (2002) and programmed for Stata software by Drukker (2003). Results show the presence of autocorrelation, so the estimates were performed taking into account the residual autocorrelation. Thus the estimates presented robust standard errors to the presence of heteroskedasticity and autocorrelation. We implemented the Breusch and Pagan (1980) LM test to check the presence of cross-sectorial correlation. The results show the presence of cross-sectorial correlation, so we use Driscoll and Kraay's (1998) robust standard errors. We also include fixed effects by petrol stations.[17] The fixed effects will collect any type of particular unobservable characteristic of each petrol station, which remains constant throughout the period analyzed, and which could be correlated with the remaining

[14] ACCC (2007) confirms that no weekend effect exists in this market, although this report draws on data from the Australian market. However, section 4 of this paper addresses this lack of information and it also supports this idea.

[15] We only included the variable with a one-period delay, but the inclusion of more delays does not significantly modify the results. We have made the same estimates including two, three, four and up to five lags of the Brent variable without the main results changing. Results are available upon request.

[16] In Annex 1 we present an alternative specification where it is verified that the price set on Monday is significantly lower than the rest of the week, especially for the three main companies (Repsol, Cepsa and BP), so it would be compatible with the existence of the 'Monday effect'.

[17] To check if we have to use fixed or random effects we performed the Hausman test. In all cases the test shows that there are systematic differences between the two estimates, suggesting the use of fixed effects.

independent variables. These characteristics can include: similar services, cleanliness of the establishment, location, quality of service, etc . Results are included in Table 3.

The econometric results show that the 'Monday effect' is confirmed in the mainland for the whole period considered. In 2012 the remaining weekdays had higher prices than Monday, between 0.13 and 0.70 cents; and between 0.28 and 0.78 cents in 2013. In the case of the Canary Islands, this price behavior is not observed, despite the fact that the same companies operate there. This difference only makes sense if we take into account that the prices of the gas stations located in the Canary Islands are not used for the *European Union Oil Bulletin ranking*. So this group of petrol stations are not affected by the 'Monday effect', as we expected, and is therefore an appropriate control group in our difference-in-difference approach.

When we analyze the results by company, the price strategy of the three leading companies (Repsol, Cepsa and BP) coincides with the 'Monday effect': prices during the rest of the week are significantly higher than the prices set on a Monday. This effect is especially important in the case of Repsol, where the prices fixed on Mondays were between 0.49 and 1.12 cents lower than the other days of the week in 2012, and between 1.02 and 1.58 cents in 2013. However, the behavior of the remaining companies is not compatible with the 'Monday effect': the price set on Mondays is not significantly lower than that fixed on other days of the week. These results are in line with those reported by the CNE (2013a) and they are also an appropriate control group.

Table 3. The 'Monday effect' compared to the remaining working days.

	Spain	Mainland	Canary Islands	Repsol	Cepsa	BP	Galp	DISA	Indep.	Coop	Low Cost	Supers
Constant	0.9595***	0.9646***	0.8553***	0.9530***	0.9605***	0.9796***	0.9752***	0.9733***	0.9771***	0.9820***	1.0130***	0.9574***
	(0.0354)	(0.0326)	(0.1059)	(0.0302)	(0.0318)	(0.0309)	(0.0340)	(0.0333)	(0.0362)	(0.0410)	(0.0332)	(0.0370)
Year2012	0.0033	0.0032	0.0062	0.0056	0.0018	0.0040	0.0032	0.0019	0.0019	-0.0059	-0.0020	-0.0027
	(0.0151)	(0.0142)	(0.0333)	(0.0056)	(0.0141)	(0.0141)	(0.0136)	(0.0132)	(0.0144)	(0.0152)	(0.0139)	(0.0150)
Tuesday*Year2012	0.0020***	0.0020***	0.0027**	**0.0064*** **	**0.0041*** **	0.0014**	-0.0054**	-0.0066***	-0.0022*	-0.0007	-0.0017	-0.0022
	(0.0006)	(0.0006)	(0.0013)	**(0.0008)**	**(0.0007)**	(0.0007)	(0.0022)	(0.0024)	(0.0012)	(0.0009)	(0.0013)	(0.0015)
Wednesday*Year2012	0.0021***	0.0022***	-0.0010	**0.0008*** **	**0.0044*** **	0.0019***	-0.0042**	-0.0043***	-0.0024**	-0.0016	-0.0023*	-0.0033**
	(0.0007)	(0.0007)	(0.0013)	**(0.0011)**	**(0.0010)**	(0.0007)	(0.0017)	(0.0015)	(0.0012)	(0.0010)	(0.0013)	(0.0016)
Thursday*Year2012	0.0067***	0.0070***	0.0012	**0.0112*** **	**0.0101*** **	0.0072***	0.0010	0.0003	0.0018*	0.0021*	0.0026**	0.0013
	(0.0010)	(0.0010)	(0.0018)	**(0.0016)**	**(0.0013)**	(0.0011)	(0.0013)	(0.0013)	(0.0011)	(0.0012)	(0.0011)	(0.0013)
Friday*Year2012	0.0003	0.0013	-0.0193*	**0.0049** **	**0.0037* **	0.0019	-0.0031	-0.0038	-0.0g032	-0.0031	-0.0013	-0.0040
	(0.0032)	(0.0029)	(0.0105)	**(0.0021)**	**(0.0022)**	(0.0026)	(0.0040)	(0.0040)	(0.0040)	(0.0046)	(0.0038)	(0.0045)
Tuesday*Year2013	**0.0026*** **	**0.0028** **	-0.0003	**0.0102*** **	**0.0034** **	0.0017	-0.0057***	-0.0073***	-0.0035***	-0.0031***	-0.0032***	-0.0049***
	(0.0012)	**(0.0011)**	(0.0027)	**(0.0013)**	**(0.0014)**	(0.0012)	(0.0008)	(0.0007)	(0.0008)	(0.0010)	(0.0009)	(0.0007)
Wednesday*Year2013	**0.0041*** **	**0.0044*** **	-0.0025	**0.0125*** **	**0.0056*** **	0.0031***	-0.0037***	-0.0037***	-0.0033***	-0.0038***	-0.0041***	-0.0036***
	(0.0013)	**(0.0013)**	(0.0024)	**(0.0021)**	**(0.0014)**	(0.0014)	(0.0014)	(0.0011)	(0.0009)	(0.0010)	(0.0010)	(0.0010)
Thursday*Year2013	**0.0013*** **	**0.0078*** **	-0.0025	**0.0158*** **	**0.0095*** **	0.0065***	0.0010	0.0006	-0.0003	0.0017*	-0.0022***	0.0004
	(0.0012)	**(0.0012)**	(0.0017)	**(0.0020)**	**(0.0012)**	(0.0014)	(0.0013)	(0.0011)	(0.0009)	(0.0009)	(0.0008)	(0.0011)
Friday*Year2013	**0.0057*** **	**0.0062*** **	-0.0035***	**0.0105*** **	**0.0072*** **	0.0075***	0.0030***	0.0024***	0.0009	-0.0007	0.0001	0.0019**
	(0.0015)	**(0.0015)**	(0.0012)	**(0.0028)**	**(0.0017)**	(0.0015)	(0.0012)	(0.0009)	(0.0008)	(0.0008)	(0.0007)	(0.0009)
$Brent_{t-1}$	0.0033***	0.0034***	0.0011**	0.0035***	0.0035***	0.0034***	0.0034***	0.0034***	0.0033***	0.0031***	0.0030***	0.0034***
	(0.0002)	(.000234)	(0.0006)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Time	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-0.0001	0.0001
	(0.0001)	(0.0001)	(0.1059)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3290924	3137856	153068	1188044	501909	199081	208562	121960	776539	35557	4362	101466
No. Petrol Stations	9834	9399	435	3416	1447	601	607	368	2501	121	19	318
F Test	84.96***	95.36***	48.94	103.18***	140.72***	90.95***	78.56***	76.78***	67.29***	56.70***	57.69***	54.78***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

After observing how the price strategy of the three main companies coincides with the 'Monday effect', and our two control groups not (petrol stations in Canary Islands and the group of low cost, cooperatives and supermarkets[18]), we implement a difference-in-difference approach to check if the behavior in the mainland is different from the Canary Island and if this behavior changed when the Ministry of Industry, Tourism and Commerce changed its method of collecting and reporting gasoline prices[19]. We can see this approach in the following equation:

$$p_{it} = \beta_0 + \beta_1 AffectedGroup_i + \beta_2 Tu_i + \beta_3 We_i + \beta_4 Th_i + \beta_5 Fr_i + \beta_6 DiDTu_i + \beta_7 DiDWe_i + \beta_8 DiDTh_i + \beta_9 DiDFr_i + \beta_{10} Brent_{t-1} + \beta_{11} Time_i + \varepsilon_{it} \quad [2]$$

where p_{it} is the retail price of petrol 95 (euros per liter) at petrol station i on day t. Tu_i, We_i, Th_i and Fr_i are binary variables that represent the day of the week, taking the value of one on the respective day and zero otherwise; *Affectedgroup* is a binary variable that take value one for the different brands located in the mainland potentially affected by 'Monday effect', and the difference-in-difference estimators (*DiD*), are the iteration between the binary variables that represent the day of the week and *Affectedgroup*. ε_{it} is the error term. Like in the previous estimation, we also include the price of a barrel of Brent in the previous period, as well as a trend variable that takes value 1 for the first day of the sample and increases (*Time*). Results can be seen in table 4A.

[18] Results do not change if we include independent retailers in the control group.
[19] Annex 2 shows results when our control group is low cost, cooperatives and supermarkets. Results do not change significantly.

Table 4A. Difference-in-Difference approach (Canary Islands as control group).

	Spain	Repsol	Cepsa	BP	DISA	Indep.
Constant	0.9625***	0.9527***	0.9577***	0.9726***	0.9381***	0.9761***
	(0.0347)	(0.0309)	(0.0342)	(0.0354)	(0.0556)	(0.0370)
Year2012	-0.0030	0.0036	-0.0045	-0.0055	-0.0136	-0.0012
	(0.0001)	(0.0142)	(0.0141)	(0.0148)	(0.0196)	(0.0145)
Tuesday	0.0014	0.0015	0.0021	0.0007	0.0011	0.0011
	(0.0021)	(0.0022)	(0.0021)	(0.0018)	(0.0017)	(0.0025)
Wednesday	-0.0019	-0.0013	-0.0011	-0.0019*	-0.0026**	-0.0011
	(0.0012)	(0.0012)	(0.0014)	(0.0011)	(0.0013)	(0.0013)
Thursday	-0.0015	-0.0014	-0.0005	-0.0011*	-0.0017	-0.0019
	(0.0015)	(0.0015)	(0.0016)	(0.0015)	(0.0013)	(0.0017)
Friday	-0.0041	-0.0042	-0.0035	-0.0043	-0.0083***	-0.0022
	(0.0033)	(0.0036)	(0.0033)	(0.0031)	(0.0028)	(0.0035)
DiDTuesday*Year2012	0.0049	**0.0063****	**0.0063***	**0.0078****	**0.0096**	-0.0012
	(0.0031)	**(0.0027)**	**(0.0032)**	**(0.0036)**	**(0.0074)**	(0.0029)
DiDWednesday*Year2012	0.0085***	**0.0095*****	**0.0099*****	**0.0110*****	**0.0161****	0.0009
	(0.0020)	**(0.0016)**	**(0.0022)**	**(0.0024)**	**(0.0064)**	(0.0017)
DiDThursday*Year2012	0.0130***	**0.0140*****	**0.0152*****	**0.0157*****	**0.0205*****	0.0059***
	(0.0021)	**(0.0025)**	**(0.0025)**	**(0.0026)**	**(0.0060)**	(0.0016)
DiDFriday*Year2012	0.0100***	**0.0106*****	**0.0118*****	**0.0137*****	**0.0240*****	0.0013
	(0.0020)	**(0.0026)**	**(0.0029)**	**(0.0015)**	**(0.0038)**	(0.0028)
DiDTuesday*Year2013	-0.0026	**0.0074*****	-0.0028	-0.0054	-0.0242**	-0.0065*
	(0.0043)	**(0.0027)**	(0.0044)	(0.0057)	(0.0117)	(0.0034)
DiDWednesday*Year2013	0.0023	**0.0125*****	0.0025	-0.0015	-0.0174	-0.0041*
	(0.0036)	**(0.0022)**	(0.0038)	(0.0049)	(0.0116)	(0.0025)
DiDThursday*Year2013	0.0053	**0.0158*****	0.0058	0.0010	-0.0142	-0.0004
	(0.0040)	**(0.0026)**	(0.0042)	(0.0057)	(0.0119)	(0.0031)
DiDFriday*Year2013	0.0062	**0.0134*****	0.0065	0.0052	-0.0058	0.0012
	(0.0052)	**(0.0049)**	(0.0054)	(0.0063)	(0.0112)	(0.0041)
$Brent_{t-1}$	0.0033***	0.0035***	0.0034***	0.0032***	0.0025***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Time	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3290924	1206252	529075	219996	194205	791073
No. Petrol Stations	9834	3467	1524	662	571	2544
F Test	287.54***	194.46***	373.50***	216.79***	223.97***	134.04***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

As can be seen in the previous table, results show that prices followed the 'Monday effect' in 2012 but not in 2013, when, according to Repsol, only they had a price strategy. Independent retailers did not follow these price patterns in either of the two years.

An explanation of this result is that 'Monday effect' was not implemented throughout 2013. Therefore, finally, we want to check if these companies decided to stop fixing significantly lower prices on Mondays, once the government modified its method of collecting and sending price data to the European Union to create the *Oil Bulletin* ranking. The exact date on which the government of Spain communicates that it stopped using Monday prices to send them to the European Union and create the Oil Bulletin is 17th May, 2013 (i.e. after 13th

May 2013). To estimate this effect we split our difference-in-difference estimators before and after this change. Results are presented in the following table, 4B.

Table 4B. Difference-in-Difference approach (Canary Islands as control group)

	Spain	Repsol	Cepsa	BP	DISA	Indep.
Constant	0.9237***	0.9171***	0.9216***	0.9340***	0.9080***	0.9315***
	(0.0405)	(0.0355)	(0.0402)	(0.0412)	(0.0638)	(0.0432)
Year2012	0.0169	0.0219	0.0139	0.0144	0.0019	0.0216
	(0.0166)	(0.0164)	(0.0166)	(0.0170)	(0.0225)	(0.0166)
Tuesday	0.0014	0.0015	0.0021	0.0007	0.0011	0.0011
	(0.0021)	(0.0022)	(0.0022)	(0.0019)	(0.0018)	(0.0026)
Wednesday	-0.0020	-0.0015	-0.0012	-0.0020	-0.0027*	-0.0012
	(0.0014)	(0.0013)	(0.0015)	(0.0012)	(0.0014)	(0.0014)
Thursday	-0.0017	-0.0015	-0.0007	-0.0013	-0.0019	-0.0021
	(0.0014)	(0.0015)	(0.0015)	(0.0015)	(0.0013)	(0.0016)
Friday	-0.0038	-0.0039	-0.0032	-0.0039	-0.0080***	-0.0018
	(0.0032)	(0.0036)	(0.0032)	(0.0030)	(0.0026)	(0.0033)
DiDTuesday*Year2012	0.0046	**0.0060****	**0.0060***	**0.0074****	**0.0094**	-0.0015
	(0.0031)	**(0.0028)**	**(0.0033)**	**(0.0037)**	**(0.0074)**	(0.0030)
DiDWednesday*Year2012	0.0085***	**0.0095*****	**0.0099*****	**0.0110*****	**0.0162****	0.0009
	(0.0021)	**(0.0017)**	**(0.0024)**	**(0.0026)**	**(0.0064)**	(0.0019)
DiDThursday*Year2012	0.0129***	**0.0139*****	**0.0151*****	**0.0156*****	**0.0205*****	0.0059***
	(0.0022)	**(0.0026)**	**(0.0026)**	**(0.0027)**	**(0.0060)**	(0.0017)
DiDFriday*Year2012	0.0113***	**0.0118*****	**0.0129*****	**0.0150*****	**0.0250*****	0.0028
	(0.0019)	**(0.0029)**	**(0.0021)**	**(0.0014)**	**(0.0035)**	(0.0025)
DiDTuesday*Year2013	**0.0160*****	**0.0226*****	**0.0146*****	**0.0133*****	-0.0007	**0.0157*****
Before 13th May	**(0.0037)**	**(0.0036)**	**(0.0035)**	**(0.0039)**	(0.0070)	**(0.0046)**
DiDWednesday*Year2013	**0.0217*****	**0.0292*****	**0.0212*****	**0.0196*****	0.0061	**0.0178*****
Before 13th May	**(0.0039)**	**(0.0044)**	**(0.0037)**	**(0.0037)**	(0.0065)	**(0.0048)**
DiDThursday*Year2013	**0.0232*****	**0.0313*****	**0.0219*****	**0.0205*****	0.0069	**0.0201*****
Before 13th May	**(0.0037)**	**(0.0040)**	**(0.0037)**	**(0.0039)**	(0.0069)	**(0.0044)**
DiDFriday*Year2013	**0.0294*****	**0.0372*****	**0.0279*****	**0.0281*****	0.0194***	**0.0244*****
Before 13th May	**(0.0048)**	**(0.0050)**	**(0.0049)**	**(0.0050)**	(0.0071)	**(0.0051)**
DiDTuesday*Year2013	-0.0140	-0.0018	-0.0137	-0.0170	-0.0388*	-0.0199*
After 13th May	(0.0117)	(0.0090)	(0.0113)	(0.0131)	(0.0218)	(0.0117)
DiDWednesday*Year2013	-0.0089	0.0029	-0.0084	-0.0137	-0.0309	-0.0166
After 13th May	(0.0106)	(0.0078)	(0.0105)	(0.0121)	(0.0212)	(0.0105)
DiDThursday*Year2013	-0.0056	0.0063	-0.0042	-0.0108	-0.0271	-0.0127
After 13th May	(0.0105)	(0.0077)	(0.0103)	(0.0123)	(0.0210)	(0.0105)
DiDFriday*Year2013	-0.0068	0.0002	-0.0056	-0.0077	-0.0195	-0.0118
After 13th May	(0.0099)	(0.0079)	(0.0098)	(0.0116)	(0.0192)	(0.0094)
$Brent_{t-1}$	0.0034***	0.0036***	0.0034***	0.0032***	0.0026***	0.0034***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0002)
Time	0.0002*	0.0002**	0.0002*	0.0002*	0.0003	0.0002*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
No. obs.	3290924	1206252	529075	219996	194205	791073
No. Petrol Stations	9834	3467	1524	662	571	2544
F Test	303.88***	271.80***	326.47***	267.34***	252.44***	153.42***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table 4B shows that on average, prices in mainland Spain are not compatible with the 'Monday effect' once the government stopped sending that day's data to configure the European ranking. In fact the prices on Tuesday, Wednesday, Thursday and Friday are

significantly lower. The result is very similar in the case of Repsol, Cepsa and BP. These companies followed, until 13th May 2013, a 'Monday effect' price strategy, and stopped following it once the European Commission changed its method of collecting retail prices in Spain. In fact, Repsol issued a press release on July 4, 2013, admitting that it set "reduced fuel prices on Mondays, a day that transportation professionals typically choose to fill their fuel tanks ahead of the week's activity".[20]

Therefore, the results show that there are no cost or demand conditions that justify this behavior. The main cost (crude oil price) is the same for all territories, but there is no Monday effect in the Canary Islands, a territory that is not part of the European Union's data collection. Likewise, the evolution of demand over a whole week is similar throughout the period analyzed, but nevertheless, from May 13, 2013, when Spain stops sending prices on Mondays to the European Union to generate the *Oil Bulletin* statistics, the 'Monday effect' disappears. Therefore, it is not cost or demand conditions that justify the 'Monday effect', but a pricing strategy implemented by the three main companies in the market with the intention of improving Spain's position in the European Union's *Oil Bulletin*.

5. **Conclusions and Policy Implications**

Despite the liberalization of Spain's petrol market, both the empirical literature and recent reports published by the country's antitrust authorities and sector regulators identify not only serious problems in the level of competition at retail level, but also at every point in the production chain.

At retail level, the European Commission's *Oil Bulletin* upholds this idea: Spain charges the highest prices before tax. This outcome received broad media attention in 2012 and 2013, raising questions about a supposed 'Monday effect'. Given that the Spanish Government

[20] See El Pais, July 4th 2013.

collects its data on final prices on the Monday of each week, there are indications that the retail price is manipulated on that day (there being no obvious economic justification for the fluctuation) so as to modify European statistics and reduce the impact of press coverage.

Drawing on a database, created specifically for this study, which includes daily prices for all petrol stations in Spain from 2012 to 2013 (more than three million observations), we sought to estimate whether Monday prices are lower than those charged the rest of the week where no economic reason sustain this potential outcome. To support this, we used two control groups: the first owned by independent retailers, low cost companies, user cooperatives and supermarkets (which are firms that exert real competition in this market, as previous literature has shown); and second, petrol stations in the Canary Islands (which were not included in the *Oil Bulletin's* statistics despite being a Spanish region).

The OLS and difference-in-difference estimations produced the following conclusions: first, prices on Mondays are lower than those charged the rest of the week at petrol stations located in mainland Spain and owned by the three main companies (Repsol, Cepsa and BP; the companies that have 70% of the market share). Thus, we observed that there is a positive relationship between market share and the price difference between Monday and the other days of the week. Therefore, it seems that the greater the market power the higher is the probability to set prices according to the 'Monday effect'; and with greater intensity.

Second, this behavior was more pronounced in the first months of 2013 than in 2012. Third, our two control groups do not suffer this 'Monday effect'. Fourth, this behavior disappears when the Spanish government stopped sending Monday prices to create the European *Oil Bulletin* price ranking, and instead sent an average of the whole week (specifically, after May 13th 2013).

All of these results support the idea that the lower prices on Mondays are not due to economic reasons, demand or cost fluctuations. Our estimates support the idea that this

pricing decision is mainly driven by the three leading companies in the field (Repsol, Cepsa and BP), and could be for one reason: trying to reduce media attention on (high) prices of gas in Spain. Companies may not feel comfortable when Spanish gasoline prices are at the top of the European rankings. The results definitely confirm not only the absence of "Monday effects" in two control groups, but also the change in price behavior after May 13, 2013 (when Spain stops sending prices on Mondays to the European Union).

Thus, our estimations show the existence of a new anticompetitive practice in this market, that has previously been identified in only two previous studies (for Norwegian and Australian markets). In fact, it has generated not only significant public concern in Spain but also led to the Spanish antitrust authority opening a case against the companies.

This is not the first paper to find empirical evidence on lower fuel prices on Mondays, although it is the first to empirically prove it. Balaguer and Ripollés (2016) indicated that diesel prices fell significantly on Mondays, both in Madrid and Barcelona, although they did not estimate whether they were lower than the remaining days of the week. Likewise, García et al (2018) showed that the prices of 95 unleaded gasoline in Spain are significantly lower on Mondays than the remaining days of the week.

In sum, this paper concurs with the extant academic literature for this market that has clearly linked high concentration at all levels of the market with reduced levels of competition. One final piece of data to take into account is that despite the impact of the economic crisis on the sector in Spain, the oil companies managed to increase their profit margin by 30 per cent in the first quarter of 2013.[21] Therefore, it is clear that the main companies that operate in the Spanish petrol market have been able to coordinate their pricing strategy, which explains how they have set higher prices and obtain extraordinary profits.

[21] See footnote 4.

References

ACCC. 2007. Petrol prices and Australian consumers, report of the ACCC inquiry into the price of unleaded petrol. December 2007.

Anderson, R.W., and R.N. Johnson. 1999. Antitrust and sales-below-cost laws: The case of retail gasoline. Review of Industrial Organization, 14, 189-204.

Balaguer, J., and J. Ripollés. 2016. Asymmetric fuel price responses under heterogeneity. Energy Economics, Vol. 54, 281-290.

Bello, A., and S. Cavero, 2008, The Spanish retail petroleum market: New patterns of competition since the liberalization of the industry. Energy Policy, Vol. 36, 612-626.

Bello, A., and I. Contín. 2010. Influencia de los factores de localización en la fijación de los precios de los carburantes de automoción en España. Cuadernos Económicos del ICE, Vol. 79, 45-67.

Bello, A., Contín, I., and B. Palacios. 2018. Pricing and margins in the retail automotive fuel market: Empirical evidence from Spain. Energy Journal, 39(SI1), 57-78.

Bacon, R., 1991. Rockets and feathers: The asymmetric speed of adjustment of UK retail gasoline prices to cost changes. Energy Economics, 13, 211–218.

Breusch, T.S., and A.R. Pagan. 1980. The Lagrange multiplier test and its applications to model specification in econometrics. Review of Economic Studies Vol. 47(1), 239-253.

Castanias, R., and H. Johnson. 1993. Gas wars: Retail gasoline price fluctuations. Review of Economics and Statistics, Vol. 75(1), 171-174.

Comisión Nacional de la Competencia. 2010. Informe sobre la competencia en el sector de carburantes de automoción.

Comisión Nacional de la Competencia. 2012a. Informe de seguimiento del mercado de distribución de carburantes de automoción en España.

Comisión Nacional de la Competencia. 2012b. Informe sobre la consulta efectuada por la Secretaría de Estado de Economía y Apoyo a la Empresa sobre el mercado de carburantes de automoción en España.

Comisión Nacional de la Energía. 2013a. Informe sobre el efecto del día de la semana en la determinación de los precios de los carburantes (periodo 2007-2012). 07 de marzo de 2013.

Comisión Nacional de la Energía. 2013b. Informe sobre el efecto del día de la semana en la determinación de los precios de los carburantes. 31 de julio de 2013.

Contín, I., and E. Huerta. 2001. Infraestructuras de red en la industria petrolera española. Ekonomiaz, Vol. 46, 76-91.

Doyle, J.D., Muehlegger, E. and Samphantharak, K. 2010. Edgeworth cycles revisited. Energy Economics, Vol. 32(3), 651-660.

Driscoll, J.C., and A.C. Kraay. 1998. Consistent covariance matrix estimation with spatially dependent panel data. Review of Economics and Statistics, Vol. 80(4), 549-560.

Drukker, D.M. 2003. Testing for serial correlation in linear panel-data models. The Stata Journal, Vol. 3(2), 168.177.

Eckert, A. 2013. Empirical studies of gasoline retailing: a guide to the literature. Journal of Economic Surveys, Vol. 27(1), 140-166.

Eckert, A., and West, D.S. 2004a. Retail gasoline price cycles across spatially dispersed gasoline stations. Journal of Law and Economics, Vol. 47, 245-273.

Eckert, A., and West, D.S. 2004b. A tale of two cities: Price uniformity and price volatility in gasoline retailing. Annals of Regional Science, Vol. 38, 25-46.

Foros, O, and Steen, F. 2008. Gasoline prices jump on Mondays: An outcome of aggressive competition? CEPR Working Paper, DP6783.

Foros, O, and Steen, F. 2013. Vertical control and price cycles in gasoline retailing, The Scandinavian Journal of Economics, Vol. 115(3), 640-661.

García, C.A., Otero, A., Félix, P., Presedo, J., and Márquez, D.G. 2018. Simultaneous estimation of deterministic and fractal stochastic components in non-stationary time series. Physica D. Vol. 374-375, 45-57.

Ivaldi, M., Jullien, B., Rey, P., Seabright, P. and Tirole, J. 2003. The economics of tacit collusion. IDEI-Toulouse. Final Report for DG Competition. European Commission.

Jiménez, J.L. and Perdiguero, J. 2011. Does accessibility affect retail prices? An empirical application. Networks and Spatial Economics, Vol. 11(3), 677-699.

Jiménez, J.L. and Perdiguero, J. 2012. Does rigidity of prices hide collusion?. Review of Industrial Organization, Vol. 41, 223-248.

Lewis, M.S. 2009. Temporary wholesale gasoline price spikes have long-lasting retail effects: the aftermath of Hurricane Rita. Journal of Law and Economics, Vol. 52(3), 581-605.

Maskin, E. and Tirole, J. 1988. A theory of dynamic oligopoly, II: price competition, kinked demand curves, and Edgeworth cycles. Econometrica, Vol. 56, 571-599.

Noel. M.D. 2007a. Edgeworth price cycles: evidence from the Toronto retail gasoline market. Journal of Industrial Economics, Vol. 55, 69-92.

Noel. M.D. 2007b. Edgeworth price cycles, cost-based pricing and sticky pricing in retail gasoline markets. The Review of Economics and Statistics, Vol. 89(2), 324-334.

Norwegian Competition Authority. 2010. Det norske drivstoffmarkedet. Available at www.kt.no.

Perdiguero, J. 2010. Dynamic pricing in the Spanish gasoline market: A tacit collusion equilibrium. Energy Policy, Vol. 38, 1931-1937.

Perdiguero, J. 2012. Tres décadas de reformas en el mercado español de gasolinas: Historia de un fracaso anunciado. Papeles de Economía Española, Vol. 134, 143-157.

Perdiguero, J., and J.R. Borrell. 2007. La difícil conducción de la competencia por el sector de gasolinas en España. Economía Industrial, Vol. 365, 113-125.

Perdiguero, J., and J.L. Jiménez. 2009. ¿Competencia o colusión en el mercado de gasolina? Una aproximación a través del parámetro de conducta, Revista de Economía Aplicada, Vol. 50, 27-45.

Valadkhani, A. 2013. Seasonal patterns in daily prices of unleaded petrol across Australia. Energy Policy, Vol. 56, 720-731.

Wang, Z. 2008. Collusive communication and pricing coordination in a retail gasoline market. Review of Industrial Organization, Vol. 32: 35–52.

Wang, Z. 2009. (Mixed) strategy in oligopoly pricing: evidence from gasoline price cycles before and under a timing regulation. Journal of Political Economy, Vol. 117(6), 987-1030.

Wooldridge, J.M. 2002. Econometric analysis of cross section and panel data. Cambridge, MA: MIT Press.

Zimmerman, P.R. 2012. The competitive impact of hypermarket retailers on gasoline prices. Journal of Law and Economics, Vol. 55, 1, 27-41.

Annex 1: Alternative specification to estimate that prices on Mondays are lower than prices on other days.

Table A1.1. 'Monday effect' with regard to each of the other working days.

	Spain	Mainland	Canary Islands	Repsol	Cepsa	BP	Galp	DISA	Indep.	Coop	Low Cost	Supers
Constant	0.9631***	0.9685***	0.8505***	0.9640***	0.9655***	0.9831***	0.9727***	0.9701***	0.9745***	0.9788***	1.0098***	0.9549***
	(0.0351)	(0.0322)	(0.1054)	(0.0292)	(0.0312)	(0.0304)	(0.0346)	(0.0338)	(0.0364)	(0.0411)	(0.0333)	(0.0375)
Year2012	0.0020	0.0019	0.0071	0.0013	0.0015	0.0028	0.0019	0.0006	0.0025	-0.0038	-0.0001	-0.0026
	(0.0147)	(0.0139)	(0.0330)	(0.0133)	(0.0135)	(0.0138)	(0.0144)	(0.0139)	(0.0149)	(0.0156)	(0.0143)	(0.0158)
Monday	0.0018**	0.0018**	0.0025**									
	(0.0009)	(0.0009)	(0.0012)									
Monday*Premium*Year2012	**-0.0095*** **	**-0.0102*** **	0.0004	**-0.0077*** **	**-0.0059*** **	**-0.0033*** **						
	(0.0016)	**(0.0017)**	(0.0012)	**(0.0009)**	**(0.0007)**	**(0.0007)**						
Monday*Premium*Year2013	**-0.0104*** **	**-0.0104*** **	-0.0018	**-0.0123*** **	**-0.0064*** **	**-0.0047*** **						
	(0.0018)	**(0.0018)**	(0.0011)	**(0.0020)**	**(0.0014)**	**(0.0013)**						
Monday*Year2012							0.0028	0.0035*	0.0012	0.0004	0.0005	0.0017
							(0.0019)	(0.0019)	(0.0014)	(0.0014)	(0.0014)	(0.0017)
Monday*Year2013							0.0013	0.0020**	0.0015*	0.0023***	0.0023***	0.0016*
							(0.0012)	(0.0009)	(0.0008)	(0.0008)	(0.0008)	(0.0009)
$Brent_{t-1}$	0.0033***	0.0034***	0.0012**	0.0035***	0.0035***	0.0034***	0.0034***	0.0034***	0.0033***	0.0031***	0.0030***	0.0034***
	(0.0002)	(0.0002)	(0.0006)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)
Time	0.0001	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	-0.0001	0.0001
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3290924	3137856	153068	1188044	501909	199081	208562	121960	776539	35557	4362	101466
No. Petrol Stations	9834	9399	435	3416	1447	601	607	368	2501	121	19	318
F Test	117.36***	149.78***	11.53***	124.68***	145.18***	154.30***	95.89***	90.02***	83.43***	77.12***	76.90***	63.33***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table A1.2. Difference-in-Difference approach (Canary Islands as control group).

	Spain	Repsol	Cepsa	BP	DISA	Indep.
Constant	0.9634***	0.9626***	0.9594***	0.9711***	0.9275***	0.9721***
	(0.0351)	(0.0301)	(0.0344)	(0.0361)	(0.0585)	(0.0376)
Year2012	0.0013	0.0013	0.0012	0.0026	0.0005	0.0023
	(0.0148)	(0.0146)	(0.0144)	(0.0154	(0.0209)	(0.0152)
Monday	0.0013	-0.0013	0.0004	0.0012	0.0021	0.0009
	(0.0016)	(0.0017)	(0.0017)	(0.0015)	(0.0014)	(0.0018)
DiDMonday*Year2012	**-0.0034****	**-0.0086*****	**-0.0050****	-0.0021	0.0115***	0.0009
	(0.0014)	**(0.0022)**	**(0.0020)**	(0.0016)	(0.0031)	(0.0008)
DiDMonday*Year2013	**-0.0077*****	**-0.0139*****	**-0.0080*****	**-0.0079*****	**-0.0084***	0.0002
	(0.0013)	**(0.0020)**	**(0.0014)**	**(0.0016)**	**(0.0047)**	(0.0016)
$Brent_{t-1}$	0.0033***	0.0035***	0.0034***	0.0032***	0.0026***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Time	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3290924	1206252	529075	219996	194205	791073
No. Petrol Stations	9834	3467	1524	662	571	2544
F Test	56.20***	89.16***	65.38***	45.23***	91.81***	56.34***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table A1.3. Difference-in-Difference approach (Canary Islands as control group)

	Spain	Repsol	Cepsa	BP	DISA	Indep.
Constant	0.9576***	0.9584***	0.9551***	0.9661***	0.9211***	0.9642***
	(0.0369)	(0.0319)	(0.0363)	(0.0380)	(0.0603)	(0.0392)
Year2012	0.0038	0.0031	0.0031	0.0047	0.0033	0.0058
	(0.0157)	(0.0146)	(0.0153)	(0.0163)	(0.0216)	(0.0159)
Monday	0.0013	0.0013	0.0004	0.0012	0.0021	0.0009
	(0.0016)	(0.0017)	(0.0017)	(0.0015)	(0.0014)	(0.0018)
DiDMonday*Year2012	**-0.0034****	**-0.0086*****	**-0.0050****	-0.0021	0.0115***	0.0009
	(0.0014)	**(0.0022)**	**(0.0021)**	(0.0017)	(0.0031)	(0.0008)
DiDMonday*Year2013	**-0.0141****	**-0.0183*****	**-0.0129****	**-0.0138***	-0.0193	-0.0082
Before 13th May	**(0.0062)**	**(0.0059)**	**(0.0059)**	**(0.0071)**	(0.0126)	(0.0056)
DiDMonday*Year2013	0.0039	-0.0059	0.0006	0.0025	0.0111**	0.0155**
After 13th May	(0.0060)	(0.0062)	(0.0060)	(0.0056)	(0.0046)	(0.0064)
$Brent_{t-1}$	0.0033***	0.0035***	0.0034***	0.0032***	0.0026***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)	(0.0003)
Time	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0001)
No. obs.	3290924	1206252	529075	219996	194205	791073
No. Petrol Stations	9834	3467	1524	662	571	2544
F Test	106.13***	122.83***	102.55***	65.54***	124.83***	114.63***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table A1.4. Difference-in-Difference approach (Low cost, cooperatives and supermarkets as control group).

	Spain	Repsol	Cepsa	BP	DISA	Galp	Indep.
Constant	0.9687***	0.9637***	0.9647***	0.9744***	0.9659***	0.9682***	0.9727***
	(0.0322)	(0.0301)	(0.0327)	(0.0334)	(0.0361)	(0.0360)	(0.0366)
Year2012	0.0016	0.0010	0.0008	0.0007	-0.0010	0.0001	0.0017
	(0.0139)	(0.0136)	(0.0139)	(0.0144)	(0.0147)	(0.0148)	(0.0150)
Monday	0.0019**	0.0020**	0.0019**	0.0017*	0.0017*	0.0017*	0.0017*
	(0.0010)	(0.0010)	(0.0010)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
DiDMonday*Year2012	**-0.0058*** **	**-0.0104*** **	**-0.0092*** **	**-0.0066*** **	-0.0004	-0.0001	-0.0009
	(0.0009)	**(0.0017)**	**(0.0017)**	**(0.0013)**	(0.0013)	(0.0011)	(0.0008)
DiDMonday*Year2013	**-0.0074*** **	**-0.0136*** **	**-0.0072*** **	**-0.0052*** **	0.0021	0.0006	0.0001
	(0.0012)	**(0.0020)**	**(0.0016)**	**(0.0016)**	(0.0014)	(0.0012)	(0.0009)
$Brent_{t-1}$	0.0034***	0.0035***	0.0034***	0.0033***	0.0033***	0.0034***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0003)
Time	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3137856	1329429	643294	340466	263345	350323	917924
No. Petrol Stations	9399	3874	1905	1059	826	1066	2959
F Test	121.85***	122.71***	176.21***	243.17***	140.56***	133.93***	87.48***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table A1.5. Difference-in-Difference approach (Low cost, cooperatives and supermarkets as control group).

	Spain	Repsol	Cepsa	BP	DISA	Galp	Indep.
Constant	0.9635***	0.9604***	0.9620***	0.9723***	0.9632***	0.9639***	0.9664***
	(0.0338)	(0.0317)	(0.0342)	(0.0346)	(0.0369)	(0.0370)	(0.0380)
Year2012	0.0038	0.0024	0.0020	0.0016	0.0002	0.0020	0.0045
	(0.0148)	(0.0145)	(0.0147)	(0.0151)	(0.0151)	(0.0152)	(0.0156)
Monday	0.0019**	0.0020**	0.0019**	0.0017*	0.0017*	0.0017*	0.0017*
	(0.0010)	(0.0010)	(0.0010)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
DiDMonday*Year2012	**-0.0058*** **	**-0.0104*** **	**-0.0092*** **	**-0.0066*** **	-0.0004	-0.0001	-0.0009
	(0.0009)	**(0.0017)**	**(0.0017)**	**(0.0013)**	(0.0013)	(0.0011)	(0.0008)
DiDMonday*Year2013	**-0.0131** **	**-0.0176*** **	**-0.0109** **	**-0.0091***	-0.0042	-0.0071	-0.0078
Before 13th May	**(0.0057)**	**(0.0059)**	**(0.0051)**	**(0.0053)**	(0.0045)	(0.0052)	(0.0057)
DiDMonday*Year2013	0.0029	-0.0066	-0.0006	0.0018	0.0132**	0.0142**	0.0145**
After 13th May	(0.0058)	(0.0061)	(0.0063)	(0.0064)	(0.0066)	(0.0062)	(0.0060)
$Brent_{t-1}$	0.0035***	0.0035***	0.0034***	0.0034***	0.0033***	0.0034***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Time	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3137856	1329429	643294	340466	263345	350323	917924
No. Petrol Stations	9399	3874	1905	1059	826	1066	2959
F Test	225.62***	173.95***	205.61***	250.80***	142.21***	136.94***	140.67***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Annex 2

Table A2.1. Difference-in-Difference approach (Low cost, cooperatives and supermarkets as control group).

	Spain	Repsol	Cepsa	BP	DISA	Galp	Indep.
Constant	0.9641***	0.9534***	0.9597***	0.9725***	0.9677***	0.9701***	0.9746***
	(0.0325)	(0.0308)	(0.0331)	(0.0335)	(0.0358)	(0.0356)	(0.0365)
Year2012	0.0041	0.0065	0.0043	0.0030	0.0011	0.0020	0.0025
	(0.0141)	(0.0139)	(0.0138)	(0.0141)	(0.0143)	(0.0142)	(0.0145)
Tuesday	-0.0033***	-0.0033***	-0.0033***	-0.0032***	-0.0032***	-0.0032***	-0.0033***
	(0.0011)	(0.0012)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Wednesday	-0.0034***	-0.0034***	-0.0034***	-0.0033***	-0.0033***	-0.0033***	-0.0033***
	(0.0010)	(0.0010)	(0.0010)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Thursday	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0005
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Friday	-0.0009	-0.0007	-0.0008	-0.0003	-0.0003	-0.0003	-0.0005
	(0.0012)	(0.0012)	(0.0012)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
DiDTuesday*Year2012	0.0048***	**0.0084*** **	**0.0045*** **	0.0027**	-0.0058***	-0.0035***	-9.07e-06
	(0.0008)	**(0.0014)**	**(0.0015)**	(0.0013)	(0.0016)	(0.0010)	(0.0004)
DiDWednesday*Year2012	0.0053***	**0.0089*** **	**0.0049*** **	0.0032*	-0.0035**	-0.0022*	-0.0001
	(0.0010)	**(0.0016)**	**(0.0018)**	(0.0017)	(0.0015)	(0.0012)	(0.0008)
DiDThursday*Year2012	0.0062***	**0.0096*** **	**0.0069*** **	0.0047***	-0.0027**	-0.0007	0.0002
	(0.0012)	**(0.0019)**	**(0.0019)**	(0.0018)	(0.0014)	(0.0009)	(0.0007)
DiDFriday*Year2012	0.0018	**0.0042***	**0.0012**	-0.0002	-0.0064	-0.0045	-0.0038
	(0.0025)	**(0.0025)**	**(0.0035)**	(0.0037)	(0.0043)	(0.0038)	(0.0037)
DiDTuesday*Year2013	**0.0070*** **	**0.0147*** **	**0.0094*** **	**0.0068*** **	-0.0018*	-0.0012	0.0007**
	(0.0008)	**(0.0010)**	**(0.0008)**	**(0.0005)**	(0.0009)	(0.0008)	(0.0003)
DiDWednesday*Year2013	**0.0088*** **	**0.0171*** **	**0.0118*** **	**0.0084*** **	0.0020**	0.0010	0.0011***
	(0.0010)	**(0.0014)**	**(0.0010)**	**(0.0006)**	(0.0010)	(0.0010)	(0.0004)
DiDThursday*Year2013	**0.0084*** **	**0.0166*** **	**0.0119*** **	**0.0079*** **	0.0024**	0.0018*	0.0001
	(0.0010)	**(0.0014)**	**(0.0009)**	**(0.0007)**	(0.0010)	(0.0011)	(0.0005)
DiDFriday*Year2013	**0.0079*** **	**0.0125*** **	**0.0108*** **	**0.0098*** **	0.0052***	0.0047***	0.0025***
	(0.0015)	**(0.0024)**	**(0.0017)**	**(0.0012)**	(0.0009)	(0.0006)	(0.0006)
$Brent_{t-1}$	0.0034***	0.0035***	0.0034***	0.0033***	0.0033***	0.0034***	0.0033***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Time	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0010)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3137856	1329429	643294	340466	263345	350323	917924
No. Petrol Stations	9399	3874	1905	1059	826	1066	2959
F Test	63.07***	72.81***	132.49***	96.18***	148.68***	118.12***	62.66***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)

Table A2.2. Difference-in-Difference approach (Low cost, cooperatives and supermarkets as control group).

	Spain	Repsol	Cepsa	BP	DISA	Galp	Indep.
Constant	0.9288***	0.9250***	0.9371***	0.9564***	0.9571***	0.9538***	0.9413***
	(0.0379)	(0.0355)	(0.0384)	(0.0373)	(0.0394)	(0.0401)	(0.0421)
Year2012	0.0222	0.0211	0.0158	0.0112	0.0066	0.0102	0.0196
	(0.0164)	(0.0165)	(0.0166)	(0.0163)	(0.0163)	(0.0165)	(0.0169)
Tuesday	-0.0033***	-0.0033***	-0.0033***	-0.0032***	-0.0032***	-0.0032***	-0.0032***
	(0.0011)	(0.0012)	(0.0011)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Wednesday	-0.0035***	-0.0035***	-0.0035***	-0.0034***	-0.0033***	-0.0034***	-0.0034***
	(0.0011)	(0.0011)	(0.0010)	(0.0010)	(0.0009)	(0.0009)	(0.0010)
Thursday	0.0002	0.0002	0.0003	0.0004*	0.0005*	0.0004	0.0004
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0009)
Friday	-0.0005	-0.0005*	-0.0005	-0.0002	-0.0002	-0.0002	-0.0002
	(0.0013)	(0.0013)	(0.0012)	(0.0011)	(0.0011)	(0.0011)	(0.0011)
DiDTuesday*Year2012	**0.0045*** **	**0.0082*** **	0.0043***	0.0026**	-0.0059***	-0.0036***	-0.0002
	(0.0008)	**(0.0013)**	(0.0014)	(0.0013)	(0.0016)	(0.0011)	(0.0005)
DiDWednesday*Year2012	**0.0053*** **	**0.0089*** **	0.0049***	0.0032*	-0.0035**	-0.0022*	-0.0001
	(0.0010)	**(0.0016)**	(0.0018)	(0.0017)	(0.0015)	(0.0012)	(0.0008)
DiDThursday*Year2012	**0.0062*** **	**0.0096*** **	0.0069***	0.0047***	-0.0027**	-0.0007	0.0003
	(0.0012)	**(0.0019)**	(0.0019)	(0.0018)	(0.0014)	(0.0009)	(0.0007)
DiDFriday*Year2012	**0.0029*** **	**0.0052*** **	0.0020	0.0004	-0.0060	-0.0039	-0.0027
	(0.0020)	**(0.0023)**	(0.0034)	(0.0036)	(0.0043)	(0.0037)	(0.0032)
DiDTuesday*Year2013	**0.0238*** **	**0.0277*** **	**0.0226*** **	**0.0183*** **	**0.0098**	**0.0126** **	**0.0200*** **
Before 13th May	**(0.0048)**	**(0.0050)**	**(0.0058)**	**(0.0054)**	**(0.0062)**	**(0.0056)**	**(0.0056)**
DiDWednesday*Year2013	**0.0263*** **	**0.0316*** **	**0.0259*** **	**0.0218*** **	**0.0125***	**0.0132** **	**0.0200*** **
Before 13th May	**(0.0054)**	**(0.0056)**	**(0.0065)**	**(0.0061)**	**(0.0067)**	**(0.0062)**	**(0.0061)**
DiDThursday*Year2013	**0.0246*** **	**0.0301*** **	**0.0239*** **	**0.0204*** **	**0.0123***	**0.0135** **	**0.0179*** **
Before 13th May	**(0.0051)**	**(0.0052)**	**(0.0061)**	**(0.0058)**	**(0.0063)**	**(0.0057)**	**(0.0057)**
DiDFriday*Year2013	**0.0294*** **	**0.0342*** **	**0.0280*** **	**0.0257*** **	**0.0180*** **	**0.0193*** **	**0.0229*** **
Before 13th May	**(0.0051)**	**(0.0052)**	**(0.0061)**	**(0.0059)**	**(0.0066)**	**(0.0060)**	**(0.0058)**
DiDTuesday*Year2013	-0.0034	0.0067	0.0012	-0.0004	-0.0091	-0.0098	-0.0111
After 13th May	(0.0073)	(0.0066)	(0.0061)	(0.0065)	(0.0068)	(0.0077)	(0.0081)
DiDWednesday*Year2013	-0.0013	0.0087	0.0035	0.0005	-0.0041	-0.0061	-0.0098
After 13th May	(0.0071)	(0.0062)	(0.0060)	(0.0062)	(0.0064)	(0.0073)	(0.0080)
DiDThursday*Year2013	-0.0015	0.0083	0.0044	0.0002	-0.0036	-0.0054	-0.0107
After 13th May	(0.0068)	(0.0059)	(0.0057)	(0.0060)	(0.0062)	(0.0071)	(0.0078)
DiDFriday*Year2013	-0.0042	0.0005	0.0012	0.0011***	-0.0017	-0.0033	-0.0089
After 13th May	(0.0068)	(0.0061)	(0.0056)	(0.0057)	(0.0056)	(0.0066)	(0.0075)
$Brent_{t-1}$	0.0035***	0.0036***	0.0035***	0.0034***	0.0034***	0.0034***	0.0034***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Time	0.0002*	0.0002*	0.0002	0.0001	0.0001	0.0001	0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
No. obs.	3137856	1329429	643294	340466	263345	350323	917924
No. Petrol Stations	9399	3874	1905	1059	826	1066	2959
F Test	256.82***	285.02***	309.35***	205.70***	191.76***	156.48***	121.24***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Robust Standard errors to heterokedasticity, autocorrelation and cross-sectorial correlation in brackets. *** (1%), ** (5%), * (10%)