

PRICE STRATEGIES OF INDEPENDENT AND BRANDED DEALERS IN RETAIL GAS MARKET. THE CASE OF A CONTRACT REFORM IN SPAIN **2018**

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Documentos de Trabajo
N.º 1818

BANCO DE ESPAÑA
Eurosistema



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(*) We are indebted to all seminar participants at the Banco de España, the presentation made at the CNMC and an anonymous referee. We also want to thank the Ministry of Energy, Tourism and the Digital Agenda for the data they provided. The opinions and analyses are the responsibility of the authors and do not necessarily coincide with those of the Banco de España or the Eurosystem.

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ISSN: 1579-8666 (on line)

Abstract

This paper analyses how the contract structure between gas stations and the wholesale operator affects price strategies. Using daily data on prices of different gas stations the paper finds that independent dealers charge lower margins than other dealers with different contracts. One potential hypothesis is that this is the case because independent stations react more to the number of competitors. We use the introduction of a discretionary regional excise duty (IVMDH) on gas stations to check the reaction of markups to changes in marginal costs of the actual number of competitors. Results are consistent with the idea that regardless the type of contract all dealers react notably to the increases in relative marginal costs by decreasing average markups. We use those results to interpret the inexistent reduction in markups that followed a change in the Spanish regulation that took place in 2013 fostering competition in the retail sector. One potential interpretation is that the big increase in independent stations following the reform was not considered an increase in actual competition for most of the incumbent stations.

Keywords: competition, oligopoly, pass-through, gasoline, excise duty.

JEL Classification: D40, H22, H23, L13, Q41.

Resumen

Este documento analiza cómo la estructura contractual entre las estaciones de servicio y el operador mayorista afecta a las estrategias de precios. Utilizando los precios diarios de las estaciones de servicio, en el documento se observa que los distribuidores independientes cobran márgenes más bajos que otras estaciones de servicio con algún tipo de contrato en exclusividad con un operador al por mayor. Una explicación posible es que las estaciones independientes reaccionan más al número de competidores. Utilizamos la introducción de un impuesto autonómico especial discrecional a los carburantes (IVMDH o céntimo sanitario) para verificar la reacción de los márgenes a cambios en los costes marginales de los competidores. Los resultados son consistentes con la idea de que, independientemente del tipo de contrato, todos los distribuidores reaccionan notablemente a aumentos relativos de los costes marginales, disminuyendo, en promedio, los márgenes. Usamos esos resultados para interpretar la reducción inexistente de los márgenes que siguió al cambio en la regulación española que tuvo lugar en 2013 para fomentar la competencia en el sector minorista. Una posible interpretación es que para la mayoría de las estaciones de servicio el importante aumento de las estaciones independientes después de la reforma no se consideró un aumento de la competencia real.

Palabras clave: competencia, oligopolio, gasolina, IVMDH.

Códigos JEL: D40, H22, H23, L13, Q41.

1 Introduction

In 2012, international oil prices reached the level of 120 \$ per barrel and, as a consequence, gasoline prices peaked.¹ This raise in prices increased the public concern regarding the competitive behaviour of the retail gas market and whether dealers were benefiting from positive oil price shocks. From the point of view of Spain, price setting in the retail gasoline market is relevant because eighty per cent of the sales of automotive fuel are channelled through the gas station network and according to the input output tables, manufacture of coke and refined petroleum products represent 4.9% of total household consumption and 3.6% of intermediate inputs being especially important in key sectors such as transportation (24.8% of their intermediate inputs are oil products), electricity (13.2%), chemistry (9%), mining (6.5%) and agriculture (4.2%). In the international context, the Spanish retail gasoline market is an interesting case to study market power because (1) historically, station ownership has been very concentrated among upstream suppliers; (2) Spain reacted to the raise in international oil prices by passing a new regulation with the aim of increasing competition in the retail segment.

Before the reform was implemented, there were slightly less than 9,000 gas stations in Spain, 79% of which were directly or indirectly tied to a supplier, while the other 21% were independent. Independent gas stations have no exclusive dealing arrangements with any major supplier. They are generally very competitive, driving down prices in their area. In particular, some of them operate with much lower variable costs since they do not have workers. Others, are linked to hypermarkets and chains of supermarkets (14% of the total independent gas stations) using low prices as a commercial strategy to attract consumers to their main business. Among those related to an upstream supplier, only 23% were directly managed by it (from now on this type of gas station will be called “supplier operated”), while the rest were “branded” dealers meaning they are managed by an independent operator with an exclusivity contract with one single upstream supplier that guarantees the supply of fuel. Before the reform, this type of gas station signed contracts accepting certain limitations in terms of the duration of the exclusive oil supply (usually 5 years) and in most cases accepting limitations to the possibility of setting a free price to the public. Usually, prices of dealers were set as a fixed commission per litre sold that was specified in the contract. As a result of these limitations, the proportion of gas stations that charge different prices to those recommended by the supplier operator was very low (less than 10% in most years).

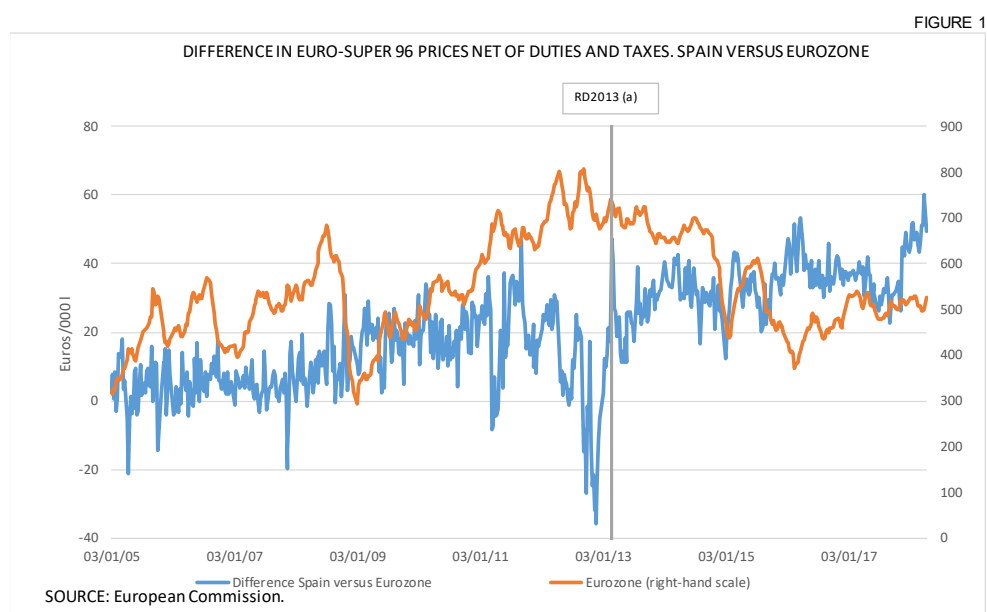
The concern regarding the lack of competition (also analysed by the National Agency of Competitive Markets -CNMC in Spanish-) grew with the peak of international oil prices. Spanish government reacted to this concern and as a consequence, enacted the Royal Decree 4/2013 (RD2013) with the aim to restrict the market power of main oil suppliers. The regulation eased the entrance of independent participants in the dealer market (increasing the number of gas stations to close to 10,000) and reduced the contractual limitations of branded gas stations in terms of contractual duration and the obligation to freely set their own gas prices leading to welfare benefits for consumers.² However, as it is shown in figure 1, after

¹ For instance gasoline prices in the Euro Area peaked from almost 600 euros/000 liter on the 3rd of January 2011 to 800 euros/000 liter on the 27th of August 2012. The increase in Spain was from 622 euros/000 liter to almost 820 euros/000 litre.

² In particular, obstacles were lifted for the establishment of gas stations in retail parks and industrial areas or estates. In turn, wholesale oil-product operators with a provincial market share of over 30% were prohibited from increasing their number of supplier operated dealers or from entering into new exclusive distribution agreements with gas stations. Furthermore, the duration of exclusive supply agreements was limited to one year, although they could be extended up to three years, and recommendations on the sale price to the public were prohibited.

the enhancement of the reform, gas price differentials between Spain and the rest of the Eurozone have remained at historical maxima (between 2 and 6 cents/liter).

Figure 1: Difference in Euro-Super 95 prices between Spain and the Eurozone net of duties and taxes



(a) Entry into force of the RD2013

This paper first analyses how different dealers with different contractual arrangements with major suppliers set their own markups and react to increases in competition. In order to do so, we benefit from exogenous changes of regional oil consumer taxes to analyse the competitive reaction of different types of gas stations depending on the number of competitors that face different fiscal regimes as a consequence of their distance to the border of two regions. Using these results we will evaluate the effectiveness of the recent reform of the Spanish retail gas station market by analysing changes in average markups before and after the reform by each type of gas station.

2 Related literature and contribution

This paper builds on previous research and relates it to other papers estimating the long run markup of different dealers and the short run asymmetric price responses to changes in wholesale prices such as Bacon (1991), Johnson (2002) and the more recent study carried out by the CNMC (2012) in where “*rockets and feathers*” behaviours were applied to the case of Spanish dealers. Basically, the results of these group of papers relates the lack of competitive behaviour with the existence of an asymmetric price response in retail prices when a rise or a fall in international costs takes place. There is empirical evidence indicating much faster response in the first case than in the second one that could reflect little effective competition in the sector. This paper relates to this kind of literature but analysing different responses by type of contract of the gas station and using a different empirical strategy to analyse the competitive behaviour.

It also relates to previous research looking at the effect of contracts on prices but using a different empirical strategy. Some papers, use the acquisitions of independent gas station chains by other vertically integrated brands, others directly relate prices to some measure of the degree of competition or to the type of contract between gas stations and oil companies and finally others take advantage of divorce laws that ban the possibility to vertically integrate. Studies of the first type include, for example, Hastings (2004), Houde (2012), Jiménez and Perdiguero (2018) and Pennerstorfer and Weiss (2013); the second Sen (2005), Chouinard and Perloff (2007), Bello and Cavero (2008), Bello and Contín-Pilart (2010) and Hogg, Hurn, McDonald and Rambaldi (2012) and the third Barron and Umbeck (1984) and Vita (2000).

The results of the first group of papers tend to find that changing an independent dealer by a supplier operated station would lead to an increase in prices. Hastings (2004), using a sample of gas stations from Los Angeles and San Diego metropolitan areas, finds that the presence of independent gas stations reduces retail prices. Houde (2012), based on fuel market data for Quebec, points to an increase in prices following a vertical merger between two companies, as well as Pennerstorfer and Weiss (2013). Jiménez and Perdiguero (2018) find that the Disa-Shell merger did not affect prices in the Canaries, since the latter were already close to monopoly levels. Similarly, those papers in the second group find that vertically integrated dealers charge higher prices. Sen (2005), using gas station data for 11 Canadian cities, negatively relates the retail prices to the aggregate market share of independent gas stations. Hogg et al. (2012) arrive at a similar result with information for the south-east region of Queensland in Australia. They find that, controlling for the cost of oil and the demographic changes in different localities, independent gas stations are characterised by low prices, while brands are associated with higher prices, and that the vertical structure of the market dictates the level of prices. Meanwhile, Chouinard and Perloff (2007), using data for 48 US states, find that differences in prices between states can be attributed to variations in demand and also to differences in taxation, environmental regulation and market power. For Spain, Bello y Cavero (2008) find that the prices of independent gas stations are lower than those related to an upstream supplier and that the prices of gas sold at gas stations branded dealers are higher than if the gas station is a supplier operated. Meanwhile, Bello and Contín-Pilart (2010), using a sample of gas stations covering the whole of Spain, apart from the Canary Islands, find that the distance to the nearest petrol station does not have a significant effect on the prices set by a petrol station, but that the presence of independent petrol stations intensifies the competition.

Finally, the third group of studies take advantage of divorce legislation that in some US states banned the control of gas stations by oil companies. Both Barron and Umbeck (1984) and Vita (2000) find that divorce laws caused an increase in retail fuel prices, since the effect of the application of a double mark-up by gas stations that were not vertically integrated predominated over the effect of the increase in competition. In a sense banning the vertical merge produced a loss in efficiency.

Finally, it relates to some papers analysing the effect of the introduction of the regional levy on prices and quantities of gasoline sold. The most closely related is Stolper (2016) and Romero-Jordán, Jorge and Álvarez (2013). Their results suggest that service stations located in regions with higher indirect taxes use their pricing policy to offset the negative effects of fuel tourism. Also, Leal, López-Laborda and Rodrigo (2009) investigate whether the differences in automotive diesel prices between regions, arising from the application of the IVMDH, have any effect on the decisions of individuals regarding the region in which to purchase fuel. Differently to those papers, our paper describes the effect on prices by type of upstream relationship in all region in Spain.

3 Data

The database is made up of individual prices for 95 octane gas notified to the Ministry of Energy, Tourism and the Digital Agenda by gas stations and suppliers of oil-related products for each facility in their distribution network, including all those with which they have some kind of link. These prices are daily prices for sales to the general public, without taking into account card discounts, exchangeable points and discounts given by other means. Gasoline stations are required to send information on the prices they charge every Monday and whenever they change them, with maximum advance notice of three days with respect to the date of application of the new prices and minimum notice of one hour before the new prices are effectively applied. This obligation also applies to suppliers, although the prices they report may be final prices or recommended prices, depending on the type of management arrangements for the gas station. At the same time, in the event of closure of the gas station for any reason (holidays, building work, etc.) the Ministry of Industry, Energy and Tourism must be advised.

The period considered is January 1st 2011 to December 31st 2017. This encloses almost 10,000 fuel stations distributed along the Spanish territory.³ On the one hand, the price series used are pre-tax prices which have been calculated by deducting taxes from the sales prices. The purpose of this decision is to eliminate the possible distortions generated by local taxes differences. On the other hand, the wholesale prices used are the gas prices in international markets.⁴

In addition to the price for sales to the general public and the date on which it is changed, information is also available on the location of the gas station (its address, longitude and latitude, including the side of the road on which it is situated). Finally, we have the information regarding the type of contract that the gas station has with respect to the major supplier. There are three types of contract arrangements. "Independent" gas stations have no exclusive dealing arrangements with any major supplier. Gas stations directly operated to a supplier ("supplier operated") and "branded" dealers meaning a management by an independent operator with an exclusivity contract that guarantees the supply of fuel with one single supplier.

³ Except Canary and Balearic Islands, Ceuta and Melilla.

⁴ Weighted average of Premium Unleaded Gasoline 10 ppm CIF MED (Platts) Quotes and Premium Unleaded Gasoline 10 ppm Cargoes CIF NWE (Platts) Quotes.

4 Empirical strategy

Table 1 estimates differences of markups, defined as the final price of the product minus the international price of its main input, by type of contract following equation (1):

$$p_{i,t} - gas_t = cte + \sum_{j=\{branded,supplier\}} \alpha(j) * contract(j)_{i,t} + \beta comp_{i,t} + \gamma_{i,t} + \varepsilon_{i,t} \quad (1)$$

where, $p_{i,t}$ refers to the level of the retail gas price in euros per liter before taxes of the i station at the t period and gas_t to the wholesale price at the t period in international markets. The two dummy variables $contract_j$ are set equal to one when the contract subscribed by the i station corresponds with the type of contract j and their values are zero in any other case. In order to capture differences in the demand by location and time we incorporate a variable that varies by station and time captured by $\gamma_{i,t}$ and the number of competitors $comp_{i,t}$ defined as the number of gas stations within a radius of 15 km depending on the Euclidean distance that separate them. The final term $\varepsilon_{i,t}$, is a random error term. In this setting, the constant is the average markup for independent dealers and average markups for branded and supply operated stations is characterized by $cte + \alpha_j$.

As it is observed in column 1 to 4 of table 1, independent dealers are the ones setting lower markups (14 cents/liter in average over the analyzed period) and markups of supplier

TABLE 1

STABLE LONG RELATIONSHIPS

	First Specification	Second Specification	Third Specification	Fourth Specification
STABLE LONG RELATIONSHIPS				
Dependent variable:				
$p_{i,t} - gas_t$				
<i>Competitors</i> _{i,t}	-0.0000548*** (0.000)	-0.0000662*** (0.000)	0.000000887 (0.975)	0.00000587 (0.84)
<i>Contract</i> _{i,t}				
Branded dealer	0.0269746*** (0.000)	0.0277505*** (0.000)	0.0265198*** (0.000)	0.0272814*** (0.000)
Supplier operated dealer	0.0253902*** (0.000)	0.02581*** (0.000)	0.025651*** (0.000)	0.0261756*** (0.000)
CONSTANT	0.15043741(a)	0.15059596(a)	0.1475661*** (0.000)	0.1468385*** (0.000)
Daily fixed effects	Yes	Yes	No	No
Municipality fixed effects	Yes	No	No	No
Zip code fixed effects	No	Yes	No	No
Daily and municipality fixed effects	No	No	Yes	No
Daily and zip code fixed effects	No	No	No	Yes
Number of observations	2156573	2190843	2156573	2190843
Adjusted R ²	0.505	0.522	0.637	0.633
Prob > F	(0.000)	(0.000)	(0.000)	(0.000)

SOURCE: Author's calculations.

Robust p-values standard errors are reported in parenthesis. The asterisks *, ** and *** indicate significance at a confidence level of 90%, 95% and 99%, respectively.

(a) These constants correspond to the average of predicted values for the dependent variable in the correspondent regression. Hence, it is not fully comparable with the estimated constants for the others two specifications where there is a baseline for a specific day and a particular geographic zone.

operated and branded dealers are higher and very similar to each other (around an additional 2.5 cent/liter).

There are several reasons why independent dealers might operate with lower markups. In particular, different types of stations might be offering different products, being the branded and supplier operated gas station those that offer alternative services that also require to run up higher operational costs (notice that many independent stations do not offer other services and they might even operate without employees). On the other hand, independent dealers might be cross subsidizing their sales with revenues of other businesses such as in the case of the stations linked to supermarkets. Finally, supplier operated and branded stations might be not adjusting prices to the real competitive pressure of each individual station.

In the following section the paper explores more in depth whether this last hypothesis might be at play checking whether different dealers react differently to increasing real competition.

5 Reaction to real change in competition: discretionary regional excise duties

This section analyzes whether competition affects differently gas stations with different contract structure following equation (2):

$$p_{i,t} - gas_t = \sum_{j=\{branded,supplier\}} \beta(j) comp_{i,t} * contract(j)_{it} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

In this setting we incorporate a fixed effect by gas station μ_i and daily dummies δ_t . As a consequence, the coefficients $\beta(j)$ identifies the change in markups due to a change in the number of competitors per type of contract.

Column 1 of table 2 shows that, the increase in the number of competitors decreases markups to all types of dealers. Nevertheless, competition affects more importantly independent than non-independent dealers since increasing 10 additional competitors in the radius of 15 km decreases by 0.6 cent /liter the markup of independent dealers, while it decreases by 0.4 cent /liter the markup of the other two types of gas stations. In any case, one should notice that the change in markups due to competition appears to be very small. This small reaction and the differential effect among types of gas stations could be attributed to an endogenous location strategy of different types of gas stations. Indeed, opening a new station is not an easy task and the distribution of independent and non-independent stations is not random since many independent stations are located outside a city where could be easier to obtain a new license. Also, it is not clear that any new station competes with the rest of gas stations that were located in the area if they were offering different products. On this regard, despite the suggestive evidence in column 1, it is not appropriate to conclude that an exogenous increase in competition might weakly affect to all dealers and especially to independent ones.

In order to have a cleaner natural experiment on this regard we are going to exploit exogenous changes in marginal costs of actual competitors by different types of gasoline dealers. In particular, we are going to use the effect on prices of a discretionary regional excise duty (IVMDH) on competing gas stations. After 2002, regional governments were allowed to impose a tax on the fuel sold. Most of the regions only decided to use this possibility during the last recession as a way to alleviate their fiscal problems. That is the reason why, within a particular local market, the imposition of this tax is exogenous to economic conditions.

The IVMDH is an excise duty levied on the volume of fuel sold. It was introduced in 2002 in order to increase the revenues of the regional (autonomous) governments. The tax has two tranches: a State tranche and a regional one (the latter popularly known as the "health cent"). Under the State tranche the tax has been levied on gas at the rate of 2.4 cent /liter ever since its introduction. The regional governments, meanwhile, may decide to establish a regional rate of tax subject to a ceiling that is currently set at 4.8 cent /liter.⁵ The rates at which the regional tranche of the IVMDH is charged on gas, and the changes made since the introduction of the tax, are set out in table 3.

⁵ This amounts between 0% and 5% of the total gross price of gas and could amount 30% of the markup. Before 2012, the regional tranche was paid by the retail dealer while after 2012 was the supplier who distributed the gas who had to liquidate it after being reimbursed by the owner of the gas station at the moment of purchase.

TABLE 2

STABLE LONG RELATIONSHIPS

	First Specification	Second Specification	Third Specification
STABLE LONG RELATIONSHIPS			
Dependent variable:			
$p_{i,t} - gas_t$			
<i>Total competitors</i> $_{i,t}$		-0.000279*** (0.000)	
Independent dealer	-0.000401*** (0.000)		-0.0003942*** (0.000)
Branded dealer	-0.000239*** (0.000)		-0.000232*** (0.000)
Supplier operated dealer	-0.0002797*** (0.000)		-0.0002719*** (0.000)
<i>Competitors with fiscal disadvantage</i> $_{i,t}$		0.00000215*** (0.757.000)	
Independent dealer			0.0000485*** (0.004.000)
Branded dealer			0.0000439 (0)
Supplier operated dealer			-0.0000429*** (0.000)
<i>Competitors with fiscal advantage</i> $_{i,t}$		-0.0023408*** (0.000)	
Independent dealer			-0.0025289*** (0.000)
Branded dealer			-0.001867*** (0.000)
Supplier operated dealer			-0.0026567*** (0.000)
Fixed effects in petrol stations	Yes	Yes	Yes
Fixed effects in day	Yes	Yes	Yes
Number of observations	21190762	21190762	21190762
Adjusted R ²	0.645	0.647	0.647
Prob > F	(0.000)	(0.000)	(0.000)

SOURCE: Author's calculations.

Robust p-values standar errors are reported in parenthesis. The asterisks *, ** and *** indicate significance at a confidence level of 90%, 95% and 99%, respectively.

REGIONAL TRANCHE OF HYDROCARBON
RETAIL SALES TAX (a)

TABLE 3

	Gasoline			
	Introduction of regional IVMDH		Change	
	Date	Rate (€/000 litres)	Date	Rate (€/000 litres)
Andalusia	10/7/10	24	23/6/12	48
Aragon	1/1/16	24		
Asturias	1/1/04	24	1/1/13	48
Balearic Islands	1/5/12	48		
Cantabria	2/6/12	48	1/1/14	24
			1/1/15	0
Castile-la Mancha	1/1/06	24	1/5/12	48
Castile-Leon	1/3/12	48	1/1/15	16
			1/1/16	0
Catalonia	1/8/04	24	1/4/12	48
Valencia	1/1/06	24	10/1/12	48
Extremadura	1/1/11	24	29/6/12	48
			1/4/15	38
Galicia	1/1/04	24	1/1/14	48
Madrid	1/8/02	1	1/1/03	17
Murcia	1/1/11	24	1/11/12	48
Navarre	1/7/12	24	1/1/14	0
			1/1/16	24
			1/1/17	0
Basque Country				
Rioja				

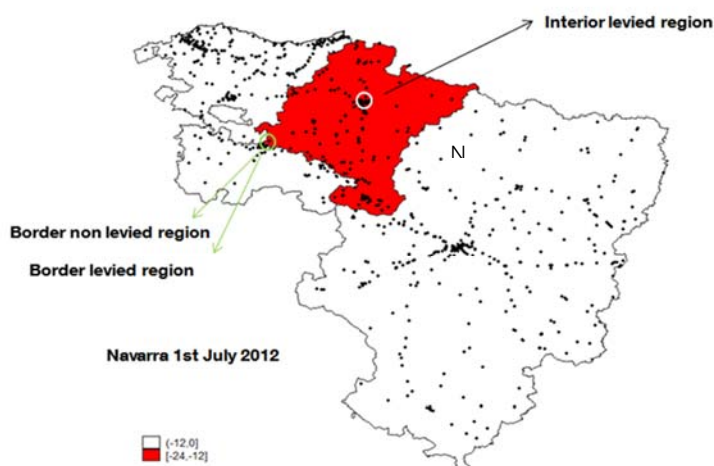
SOURCE: BE calculations

a. Not applicable in the Canary Islands, Ceuta or Melilla. No data is shown for the regions that do not levy tax under the regional tranche.

As this table shows, the importance of the “health cent” has been increasing over time with the goal to reduce the regional deficits. The first regional government to introduce the health cent was Madrid in 2002. In 2012, a large number of regional governments introduced or increased the “health cent”, generally up to the top rate permitted. Indeed by the end of the year all regions levied the tax with the exception of Aragon, the Basque Country and La Rioja.⁶

With the location information of gas stations competitors can be divided among those who have a fiscal advantage, those who have disadvantage and those who are treated with the same fiscal system. As an example, see figure 2, for the case of gas stations in the Spanish region of Navarra and bordering regions on the 1st of July.

⁶ Although tax was levied in Navarra between July 2012 and December 2013 and between January 2016 and December 2016.



SOURCE: Author's calculations.

Empirically, the paper analyzes the change in the markup before and after the introduction of the levy according to equation (3):

$$\begin{aligned}
 p_{i,t} - gas_t = & \sum_{j=\{branded,supplier\}} \beta(j) comp_{i,t} * contract(j)_{it} + \\
 & + \sum_{j=\{branded,supplier\}} \beta(j) comp_{i,t}^{Lower IVMDH} * contract(j)_{it} + \\
 & + \sum_{j=\{branded,supplier\}} \beta(j) comp_{i,t}^{Higher IVMDH} * contract(j)_{it} + \\
 & \mu_i + \delta_t + \varepsilon_{i,t}
 \end{aligned} \tag{3}$$

where $comp_{i,t}^{Lower IVMDH}$ is the number of competitors that face a fiscal advantage and $comp_{i,t}^{Higher IVMDH}$ is the number of competitors that face a fiscal disadvantage.

Column 2 in table 2 shows that gas stations that are at the border and have a fiscal disadvantage tend to reduce their markups. The economic magnitude of this decrease is similar to the size of the imposed tax. This is the case because in average gas stations have 8 competitors with fiscal advantage, hence the coefficient of 0.23 must be multiplied by this amount to reach 2 cents /liter. The results are consistent by those obtained in Stolper (2016) and Romero-Jordán, Jorge and Álvarez (2013) and suggesting that service stations located in regions with higher indirect taxes offset this disadvantage by decreasing markups. On the other hand, those who have advantage do not react much to the change. Notice that despite facing a positive and statistically significant coefficient, the economic magnitude is not relevant since it is 0.005 cent /liter. This no-reaction is consistent with the previous reaction of levied gasoline stations since those affected by the levy were the ones who decreased their markups, as a consequence it was not necessary for those with a fiscal advantage to react at all.

Column 3 does the same exercise but distinguishing by type of gas station. We observe a similar result regardless the type of contract that the gas station has with respect the upstream supplier. In particular, both independent and supplier operated dealers decrease their margins by 0.25 cent /liter and 0.26 cent /liter respectively, while those branded stations reduced slightly less 0.19 cent /liter. On the other hand, regardless the type of contract

the increase in markups with disadvantage competitors is minor (0.01 cent/liter for independents, 0.004 cent /liter for supplier operated and not even significant for branded dealers).

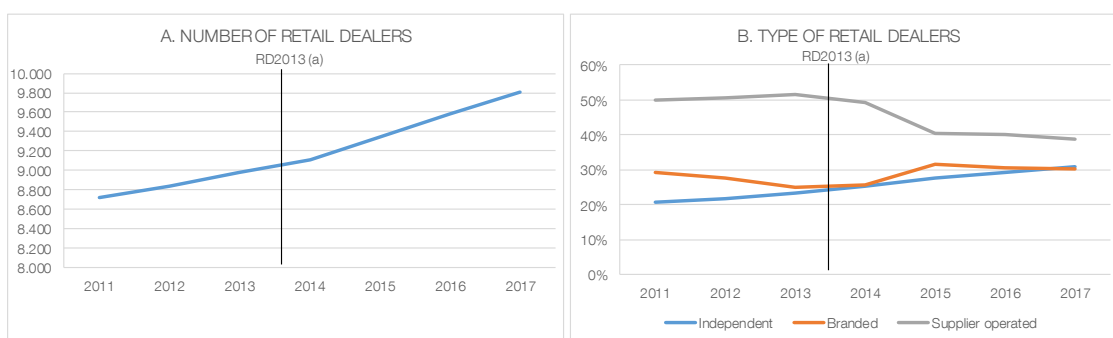
We interpret those results as suggestive evidence that real competition, defined as a change in the actual marginal cost of current competitors, affect all gas stations regardless the type of contract they have. Moreover, fixed effect estimation of the effect of new gas stations on markups might be downward biased due to both the endogenous location of firms and the possibility that new agents were competing in different segments of the market.

6 Gas market after the reform

In this section, we use the previous results to interpret the effects of the 2013 reform. As the requirements to open a gas station were eased, between 2013 and 2017, the number of gas stations went up (see panel A of figure 3) from 8.979 to 9.805. Indeed, this increase is almost fully attributed to new independent stations probably due to the restriction enhanced in the regulation that limits the percentage of stations selling a particular brand in non independent station to be lower than 30% of all stations in the corresponding province⁷ (see panel B of figure 3). These developments raised the percentage of independent stations from 20% in 2013 to 31% in 2017. Since 2013 the number of non independent stations remained constant (there were 6.877 non independent stations in 2013 and 6.779 in 2017). Within them the share of branded dealers increased. The increase in branded dealers is attributed to a strategic behavior of supplier operated dealers that decide to leave the management of the station to independent agents with an exclusivity contract.

GASOLINE DEALER MARKET IN SPAIN

FIGURE 3



SOURCE: Author's calculation.
 a. Entry into force of the RD2013.

As a result of the increase in competition and the reduction of the contractual limitations of branded gas stations to freely set their own gas prices, one should expect two consequences:

- A general decrease in average markups.
- A relatively higher decrease of markups for branded dealers because they are not only affected by the increase in competition but also by the changes in the contractual relationship allowed with the wholesale supplier.

The first hypothesis could be checked using Eurostat data on weekly prices of gas stations by country in the EU for the period 2011-2017. We estimate the differential average markup of the gas market in Spain and different countries in the Euro Area (EA). The potential relative effect of the reform in Spain is estimated using the following specification:

$$\begin{aligned}
 p_{i,t} - gas_t = cte + \beta_1 * 1(i = Spain)_i + \beta_2 1(t > Law)_t + \\
 + \beta_3 * 1(i = Spain)_i 1(t > Law)_t + \gamma_{i,t} + \varepsilon_{i,t}
 \end{aligned}
 \tag{3}$$

⁷ This limit was eliminated on July 1, 2016.

Here, $p_{i,t} - gas_t$ refers to the average markup in country i in week t , $1(i = Spain)_i$ is a dummy variable that is equal to 1 if the observation corresponds to Spain and a dummy variable $1(t > Law)_t$ that is equal to 1 if the corresponding week belongs to the period after the approval of the regulation. In order to capture differences in the demand by country and time we incorporate $\gamma_{i,t}$ that is a weekly fixed effect in some specifications. In others, the observations are averaged by month and country and $\gamma_{i,t}$ includes country dummies and the monthly unemployment rate in the country. The error term is $\varepsilon_{i,t}$ and cte represents the average markup of the comparison country/group of countries. In this setting the average markup in Spain is different to the one in other countries by β_1 and this difference will change by β_3 in relative terms after the reform.

Table 4 contains the results of these estimates. With the exception of Italy, average markups in Spain are higher than those in other countries (Germany, France, Ireland and Portugal). In particular, Spanish gas stations charge an additional amount of 4 cents/liter compared to France, 3 cents/liter compared to Germany and Ireland, 0,3 cents/liter compared to Portugal and -1 cents/liter compared to Italy. Also, notice that for all countries the relative markup in Spain increases after the reform between 2 and 3 cents/liter. The relative increase is consistent in all specifications (single countries, group of big countries and group of periphery countries) or even taking into consideration different country specific macrodevelopments when incorporating the unemployment rate. Finally, the increase in average markups in Spain after the reform appears to be maintained after several years (for the period 2016-2017). Hence, even in the case that dealers required some time to learn how to operate in the new environment it seems that they kept higher markups in Spain compared to other countries.

In order to check the validity of the second hypothesis, Eurostat does not provide prices by type of contract hence equation (3) cannot be run interacting type of contract and country of location. However, equation (1) for Spanish dealers could be run interacting average margins by type of contract and time dummies. This is illustrative of how different dealers are changing their average markups. Table 5 shows the results. The two columns represent different specifications of $\gamma_{i,t}$. Column 1 in Table 5 controls for fixed effects by gas stations. Hence this column identifies changes in average markups for either independent, branded and supplier operated dealers. Column 2 controls for fixed effects and daily dummies separately. On this regard, daily dummies capture changes that apply to all stations and only relative changes of two types of stations could be identified.

Column 1 shows that independent dealers after the reform decreased their markups by 0.1 cents/liter whereas branded dealers increased their markups by 1.3 cents/liter and supplier operated dealers increased them by around 0.7 cents/liter. The differences in reaction by type of dealer are kept in column 2. Indeed, independent dealers decreased markups by 1 cent/liter respect to supplier operated stations and branded dealers increased relative markups by 0.4 cents/liter. This behaviour is even exacerbated during the last years of the sample (2016-2017). In particular, according to column 1 average markups of independent stations decreased by 0.5 cents/liter, those of branded dealers increased by 3.5 cents/liter and those of supplier operated dealers increased by 2.6 cents/liter. Similar results are obtained in the second column. In columns 3 and 4 we add the number of competitors as an additional robustness check.

Summarizing, Spanish markups of gasoline stations have increased respect to the evolution of those in other countries after the new regulation despite the big increase in the number of independent gasoline stations. Within Spanish stations, markups decreased for independent dealers whereas they even increase for branded and supplier operated stations.

	Sample with Spain and:							All countries
	Germany	France	Italia	Irlanda	Portugal	Big (a)	Periphery (b)	
Dependent variable:								
$P_{i,t} - gas_t$								
<i>Spain dummy</i>	0.0270512*** (0.000)	0.0375771*** (0.000)	-0.0120552*** (0.000)	0.0270167*** (0.000)	0.003476* (0.097)	0.0175244*** (0.000)	0.0061458*** (0.014)	0.0462973*** (0.001)
<i>after reform dummy</i>	0.0077811*** (0.008)	-0.0009734*** (0.276)	-0.0080513*** (0.001000)	-0.0023778 (0.62)	0.0075089*** (0.004)	0.0007195 (0.72)	-0.0009734 (0.72)	0.0021053 (0.405)
<i>Spain dummy# after reform</i>	0.0131107*** (0.000)	0.0185642*** (0.000)	0.0289423*** (0.000)	0.0233479*** (0.000)	0.0134139*** (0.000)	0.0202057*** (0.000)	0.0219014*** (0.000)	0.0195922*** (0.000)
<i>2016-2017 year dummy</i>	-0.0002385 (0.916)	0.0060855*** (0.01)	-0.0057028** (0.033)	0.0065719 (0.084)	-0.001014 (0.771)	0.0000481 (0.9820)	-0.0000483 (0.987)	-0.0034507 (0.227)
<i>Spain dummy# 2016-2017 year dummy</i>	0.0047667 (0.122)	-0.0018001 (0.568)	0.0101259*** (0.002)	-0.0024045 (0.590)	0.0054376 (0.177)	0.0043641 (0.134)	0.0043863 (0.221)	-0.0001977 (0.968)
<i>Unemployment rate</i>								-0.0012445* (0.088)
<i>Weekly fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
<i>Monthly fixed effects</i>	No	No	No	No	No	No	No	Yes
<i>Country fixed effects</i>	No	No	No	No	No	No	No	Yes
CONSTANT	0.126152*** (0.000)	0.1021016*** (0.000)	0.1517525*** (0.000)	0.127093*** (0.000)	0.136203*** (0.000)	0.1221564*** (0.000)	0.1335549*** (0.000)	0.1230816*** (0.000)
Number of observations	690	690	690	690	690	690	690	504
Adjusted R ²	0.50	0.70	0.27	0.39	0.25	0.55	0.34	0.44
F	183	351	49	117	66	192	81	66
Prob > F	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

SOURCE: Author's calculations.

Robust p-values standard errors are reported in parenthesis. The asterisks *, ** and *** indicate significance at a confidence level of 90%, 95% and 99%, respectively.

(a) Big includes Germany, France and Italy.

(b) Periphery includes Italy, Portugal and Ireland.

STABLE LONG RELATIONSHIPS BEFORE AND AFTER THE REFORM

STABLE LONG RELATIONSHIPS				
Dependent variable:				
$p_{i,t} - gas_t$				
<i>competitors</i> _{i,t}			-0.000047*** (0.000)	-0.0001028*** (0.000)
<i>Contract</i> _{it}				
Independent dealer				
After RD2013	-0.0024592*** (0.000)	-0.0074455*** (0.000)	-0.0023462*** (0.000)	-0.0074734*** (0.000)
2016-2017 years	-0.0060666*** (0.000)	-0.0201269*** (0.000)	-0.0058396*** (0.000)	-0.0202348*** (0.000)
Branded dealer				
Before RD2013	0.0037929*** (0.000)	0.0037621*** (0.000)	0.0037319*** (0.000)	0.0036503*** (0.000)
After RD2013	0.0096829*** (0.000)	0.0046517*** (0.000)	0.0097742*** (0.000)	0.0045826*** (0.000)
2016-2017 years	0.0172558*** (0.000)	0.0029441*** (0.000)	0.0174817*** (0.000)	0.0028356*** (0.000)
Supplier operated dealer				
Before RD2013	-0.0004793*** (0.000)	0.0000697*** (0.207.000)	-0.0005176*** (0.000)	0.00000705*** (0.898.000)
After RD2013	0.0039577*** (0.000)	-	0.0040707*** (0.000)	-
2016-2017 years	0.0137338*** (0.000)	-	0.0140047*** (0.000)	-
CONSTANT	0.1628077*** (0.000)	-	0.1651416*** (0.000)	-
Daily control	No	Yes	No	Yes
Fixed effects in petrol stations	Yes	Yes	Yes	Yes
Number of observations	21190843	21190843	21190843	21190843
Adjusted R ²	0.418	0.654	0.418	0.655

SOURCE: Author's calculations.

Robust p-values standar errors are reported in parenthesis. The asterisks *, ** and *** indicate significance at a confidence level of 90%, 95% and 99%, respectively.

7 Discussion and conclusions

This paper finds empirical evidence about the different behaviour of gasoline dealers depending on the kind of contract set up with the operator supplier. In general, independent dealers charge lower markups than those dealers more related to the upstream supplier.

The paper checks one potential explanation for this different behavior that is a different reaction to competition by dealers with different contracts. Usual regressions exploiting the variation in the number of competitors provide small effects of this variable in markups that are more concentrated on independent stations. Changes in the number of competitors might be endogenous to location specific demand developments, hence we benefit from the introduction of a discretionary regional excise duty (IVMDH) on gas stations in particular Spanish regions. We check the pass through of the levy to prices of stations with different contracts that were located in the border of a levied and a non-levied region. Results are consistent with the idea that regardless the type of contract the gas station has, all of them react to competition more intensively than basic regressions would predict.

We use those results to interpret the effect on prices of a regulation change in Spain that occurred after the increase in oil prices in 2012. The law was enhanced with the aim to restrict the market power of main oil suppliers. The regulation eased the entrance of independent participants in the dealer market and reduced the contractual limitations of branded gas stations to freely set their own gas prices leading to welfare benefits for consumers. Our results suggest that:

- Despite a notable increase in independent operators during the period post reform Spanish markups increased compared to Eurozone dealers.
- According to the type of contract, only Spanish independent dealers decreased their markups after the reform while both supplier operated and branded dealers increased. While the first result was expected given the increase in independent competitors, the other two results were not.

One potential explanation is that the relevant market for different dealers might be different by type of contract. It might be the case that independent dealers, which were increasing in number (especially in the low cost segment), only compete against other independent dealers while branded and supplier operated dealers compete with each other. Gas stations are not randomly allocated geographically. Hence, when changing marginal costs of competitors it is likely that “real” competition is affected. On the contrary, most of the increase in the number of competitors after the reform was due to the entrance of independent dealers. Those gas stations might be only competing against other independent dealers. As a consequence, the measure of the government could have increased the incentive of branded and supplier operated dealers to differentiate their product even more and increasing their market power to obtain higher markups.

Additionally it seems that until the moment in which it was written this paper, the measures trying to liberalize the market of branded dealers had no effect on their markups since their behavior was still very similar to that of supplier operated dealers.

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