



## Gender's moderating role in the relationship between organisational form and performance in the Spanish supermarket industry

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### ABSTRACT

This research seeks to discover how the organisational form (franchising vs. vertical integration) of 305 supermarkets belonging to a Spanish franchise chain influences unit-level performance measured through three key performance indicators commonly used in the retail literature: sales per square metre, sales per employee, and service quality scores. Additionally, we assess the moderating role of the manager's gender in each individual supermarket. We have analysed the research questions using multivariate analyses, with a panel dataset that includes quarterly establishment-level data covering the period from January 2017 to December 2019. We have found that franchised supermarkets record higher sales both per square metre and per employee than vertically integrated ones. This positive effect of franchising is lower in establishments run by females than in those run by males. The findings also reveal that franchised supermarkets record lower service quality scores than their company-owned counterparts, and this negative effect is again lower in establishments managed by females than in those managed by males.

### 1. Introduction

The coexistence of franchised and vertically integrated establishments in the same chain is a major topic for researchers studying entrepreneurship and small business management (Brand and Croonen, 2010). At network level, scholars have analysed the synergies between franchised and vertically integrated outlets in the same chain (Bradach, 1997, 1998), while at establishment level they have examined the performance differences between franchised and company-owned outlets, with mixed findings (Kosová et al., 2013; Shelton, 1967; Vázquez-Suárez et al., 2020). One of the goals of research in this field is to discover whether one of these two organisational choices outperforms the other. This is a key issue, as whatever influences a business's performance also affects its efficiency and long-term survival. In this study, we contend that the gender of each individual outlet's manager may shed some light on these relationships.

Nothing has been published on the differences between franchising

and company ownership in terms of establishment-level performance in the supermarket industry. Moreover, no articles have thus far been published on gender's moderating role in the relationship between the organisational form of individual establishments and their performance in franchise chains, although females' move into management positions is now a major academic and practical research stream that is attracting a great deal of attention. There are myriad instances of research that have already used a range of measures to investigate gender differences in business performance, including earnings, turnover, and business failures (Marco, 2012; Menicucci et al., 2019; Robb and Watson, 2012), but no one has addressed gender and business performance in the supermarket industry. There are even inconsistent findings on this issue in other industries, as we shall see in due course.

This research is based on a panel dataset that corresponds to a Spanish supermarket firm, whose identity cannot be revealed for reasons of confidentiality.<sup>1</sup> The data provided are comprehensive, consisting of quarterly unit-level figures for the KPIs studied. The data also show

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<sup>1</sup> We thank this firm for providing these data.

whether each supermarket is franchised or vertically integrated, and whether each establishment is run by a male or a female, together with sundry other characteristics (e.g., each establishment's age and size). We also have data on local markets, which means we can control for several variables with an impact on the KPIs studied.

This article is structured as follows. Section 2 reviews the literature and develops our hypotheses. Section 3 introduces the data and the empirical model used. Section 4 presents the results of our analyses, and Section 5 concludes.

## 2. Literature review

### 2.1. Organisational form and business performance in franchise chains

Supermarket franchise chains may choose to run their establishments either through their own employees, or by outsourcing them to franchisees. This is an important matter because franchisees and managers of vertically integrated establishments have different incentives, which could affect their establishment's performance (Bradach, 1998; Brickley and Dark, 1987; Lafontaine, 1992; Sveum and Sykuta, 2019; Vázquez-Suárez et al., 2020).

The joint presence of two different organisational forms within the same business structure creates hiring and incentive problems that have been studied by agency theory. The argument here is that managers of vertically integrated establishments will underperform franchisees because franchising avoids the former's moral hazard issues (Carney and Gedajlovic, 1991; Jensen and Meckling, 1976). Agency theory reasons that franchisees have greater incentives to keep a close eye on their employees, as their own wealth depends heavily on the establishment's performance (Rubin, 1978). In theory, this incentive should prompt franchisees to invest more effort than the company's own managers, and thereby prompt different levels of unit performance. In our case, it may be argued that managers of vertically integrated supermarkets have fewer incentives to work harder than franchisees, thereby reducing an establishment's performance. We may also posit accordingly that because franchisees are part of a network, they might free-ride on the franchisor's brand name, in detriment to their service quality (Brickley and Dark, 1987). Free-riding is identified in the management literature as withholding effort, whereby an individual will be less engaged in a job-related task (Kidwell and Bennett, 1993). Free-riding occurs when a member of a franchise system benefits equally from it without shouldering their fair share of the expense through a contractual relationship designed to lower their costs by opting out of activities that would reinforce the overall chain. This includes, for example, ignoring company procedures in matters of quality or service. The customer therefore receives a substandard product or service, gaining a negative view of the overall brand. Although the management literature has not studied this issue in the supermarket industry, previous research has analysed this topic of differential performance in the hospitality literature, with mixed outcomes. The following paragraphs provide a review of the literature.

Shelton (1967) compares the performance of franchised and vertically integrated fast-food restaurants that have changed from franchising to vertical integration, or vice versa. In 19 of the 22 restaurants studied, the establishments were more profitable under franchising. Shelton's focused research is its main advantage, with no change in market and unit characteristics when the business's organisation shifted from one form to the other. Ackermann (2019) has also addressed this issue in a US casual dining chain called Applebee's by examining the revenues of 60 units that moved from company ownership to franchising. At the beginning of 2007, there were 93 Applebee establishments operating in Texas, 33 of which were franchised. A corporate sell-off strategy launched in 2007 meant that every company-owned unit had been franchised by the end of 2008. By observing these units' revenues before and after they had been franchised, Ackermann has estimated the effect of franchising on unit performance, finding that this organisational form increased unit sales in Applebee's case.

Beheler et al. (2008) have studied the differences in performance in the restaurant industry between franchised and company-owned establishments, finding that the latter record significantly lower scores in health inspections, thereby supporting the premise that they record a weaker performance. Krueger (1991) backs this claim by finding that the differential effect of contractual arrangements provides the managers of vertically integrated establishments with fewer incentives to mentor and supervise their staff, whereby employees in those units belonging to fast-food chains earn slightly more and have steeper earning profiles than their peers in franchised units. Krueger also contends that managers' lesser incentives in company-owned establishments render it advisable to be more generous in performance-linked wages and provide steeper earning profiles. These same findings have been reported by Freedman and Kosová (2014), stating that differences in pay and HR practices provide backing for agency theory, whereby franchisees monitor their staff more closely.

Sveum and Sykuta (2019) have studied the US restaurant industry and found that franchisee ownership has a major and lasting impact on performance in full-service restaurants, but not so in the case of limited-service units. Anderson (1984) has addressed performance differences across franchised and company-owned establishments in 17 business areas, with 11 recording differences. In seven of these 11 business areas, company-owned units post a sharper increase in average sales than their franchised counterparts, although in some cases this has been attributed to more favourable locations.

Agency theory might argue that, as part of a franchise network, franchisees could free-ride on the brand, and consequently provide less quality. Considering that a franchisee is part of a larger chain, positive spillover means it can free-ride on the parent brand (Brickley and Dark, 1987), diminishing quality compared to company-owned outlets. Franchisees base their turnover on serving their own customers, so they increase their profit margin by delivering lower cost/quality, but this means spreading the costs of dissatisfied customers across all the other franchisees in the chain (Brickley and Dark, 1987). Franchising lowers monitoring costs, encouraging franchisees to make a greater effort than the franchisor's own managers, although this may encourage individual free-riding that undermines coordination (Michael, 2002) and weakens the brand's reputation (Kidwell et al., 2007; Lafontaine and Shaw, 2005; Michael, 2000). Jin and Leslie (2009) support this argument in the restaurant industry by finding lower hygiene scores in franchised establishments than in company-owned ones within the same chain. Michael (2000) provides more support for franchisee free-riding, finding lower customer quality ratings for predominantly franchised networks.

Even though the evidence has supported results consistent with the higher performance of both franchised and vertically integrated establishments, some scholars have not found any outcome differences that favour either one or the other. A qualitative study of franchise systems in the restaurant industry by Bradach (1998) has not reported any differences between the two types of establishments. In turn, Kalnins and Mayer (2004) have observed similar failure rates for franchised and vertically integrated establishments. Furthermore, recent investigations have not observed any significant performance differentials between vertically integrated and franchised outlets (Kosová et al., 2013; Lawrence and Perrigot, 2015; Vázquez-Suárez et al., 2020). In short, the empirical evidence is diverse. Some scholars have observed that performances differ, but others have found that organisational form has no impact whatsoever.

In view of the above, franchisees may be encouraged to work harder than the managers of vertically integrated supermarkets (Rubin, 1978). Agency theory states that franchisees are likely to closely monitor their employees, as their own wealth depends largely on their business's performance. Corporate employees also require close monitoring, which means franchisors can save on costs by incentivising franchisees through residual profits. Franchise agreements to some extent resolve the issue of motivating company managers, as they might relax their effort because their own particular interests are not so directly linked to their

supermarkets' performance. A franchisee's capital investment should decrease shirking compared to company managers, whereby franchisees should perform better than the managers of vertically integrated supermarkets in terms of staff monitoring. Franchised supermarkets should therefore outperform company-owned establishments in measures such as sales per square metre (SPSM) and sales per employee (SPE), which are directly related to labour productivity and managerial supervision. We may therefore expect the following when controlling for those variables linked to supermarkets' demographics and the nature of their local markets:

**H1.** Franchised supermarkets will outperform their company-owned counterparts in SPSM and SPE.

Besides explaining the weaker performance of vertically integrated establishments, agency theory can also be used to argue that franchised outlets will, in turn, underperform them, as franchisees share their brand with the rest of the network, so they might want to reduce costs and free-ride accordingly (Lafontaine and Shaw, 2005), in the knowledge that they will not bear the full brunt of customer dissatisfaction because the ensuing costs are shared by both the franchisor and other franchisees. Franchisees might therefore free-ride on the brand and skimp on quality. As franchisees are part of a chain, they can free-ride on the brand's overall reputation (Brickley and Dark, 1987; Jin and Leslie, 2009; Lawrence and Perrigot, 2015), thereby delivering lower levels of service quality. When controlling for a series of variables linked to supermarkets' demographics and the nature of their local markets, we may therefore expect the following:

**H2.** Franchised supermarkets will underperform their company-owned counterparts in service quality scores.

## 2.2. Gender and business's performance in franchise chains

Gender differences in competitive terms have attracted considerable interest, largely because they help to explain the differential success between the genders in the labour market (Booth and Nolen, 2012; Buser et al., 2014; Saccardo et al., 2018; Sutter and Rützler, 2014). The literature has shown that males are more competitive than females (Almás et al., 2015; Datta et al., 2013; Flory et al., 2015; Wozniak et al., 2014). Research has gauged people's reactions to changes in the competitive nature of compensation schemes, revealing that males perform better than females in a competitive setting (Andersen et al., 2013; Gneezy et al., 2003; Shurchkov, 2012). The research also suggests that males are less reluctant than females to engage in competitive interactions, such as tournaments. This means that males' performance is influenced more by the competitiveness of the environment. For instance, Gneezy et al. (2003) report experiments in which females do indeed appear to be less willing to compete. In highly competitive situations, therefore, males make an extra effort, while females do not; in other words, males respond better to competition than females. In short, because (1) franchisees have a more competitive compensation scheme than managers of company-owned supermarkets, as the personal wealth of the former depends heavily on their business's performance (Rubin, 1978), and (2) males perform better than females when they operate in highly competitive settings, we may formulate the following hypothesis:

**H3.** Franchising's positive effect on SPSM and SPE will be lower in establishments run by females than in those managed by males.

The evidence of gender differences in terms of honesty, compliance and overconfidence –all indicators of the extent to which franchisees uphold their chain's quality standards– support the notion that there may be differences between males and females in their willingness to comply with these standards. Social preferences might explain why some people behave unethically and others ethically in the same circumstances. People with more marked social preferences, such as those that are relatively more prosocial, might incur higher psychological costs when they act in an unethical way that has negative consequences

for someone else's payoff (Grosch and Rau, 2017). More pronounced social preferences might therefore inform more ethical behaviour to protect another person's payoff. Generally speaking, females seem to be more ethical/honest than males (Buccioli and Piovesan, 2011; Dreber and Johannesson, 2008), and this difference is associated with gender differences in social preferences (Grosch and Rau, 2017). For instance, male groups and mixed groups tend to record more instances of pre-variation than all-female groups (Muehlheusser et al., 2015). Females are arguably more ethical and relationship-oriented than males (Gilligan, 1982; Healy and Pate, 2011; Kuhn and Villeval, 2014), hence they are seen as more communal, which has been labelled as "the female advantage" (Eagly and Carli, 2003). They therefore look upon their businesses as interconnected systems of relationships, as opposed to separate economic units (Brush, 1992). These characteristics enhance the ability to work with others in a group, to collaborate, and to cooperate (Peterson and Seligman, 2004), and the people with them tend to be loyal and trustworthy, care for the common good, defer short-term gratification for the group's long-term benefit, and are high in social responsibility (Seligman, 2009). These characteristics are most strongly expressed when the individual feels a sense of solidarity and engage with other group members (Peterson and Seligman, 2004). Therefore, the greater inclination towards ethical behaviour by female franchisees should therefore favour stricter compliance with their chain's quality standards. Additionally, it has been reported that females are more reliable than males (Alm et al., 2010, 2012; Cadsby et al., 2006; Karakostas and Zizzo, 2016), which would also suggest that female franchisees comply more closely with their chain's quality standards. Finally, there is evidence to suggest that males are more confident than females (Estes and Hosseini, 1988; Hmieleski and Baron, 2009; Niederle and Vesterlund, 2007; Soll and Klayman, 2004; Wilson et al., 2007). As a result, they have different perceptions of the probability distribution underlying a given risk. Such overconfidence could well translate into lower compliance with quality standards if male franchisees underestimate their risk of audit by the franchisor.

As noted, franchisees share the brand, so they might want to reduce costs by free-riding, breaching quality standards, and delivering a lower level of service quality. Gender differences in honesty, compliance, and overconfidence point to varying attitudes in the willingness to uphold quality standards and the optimal level of service quality. The following hypothesis is therefore formulated:

**H4.** The negative impact franchising has on service quality scores will be lower in establishments run by females than in those managed by males.

## 3. Data and research methodology

### 3.1. Dataset and sample

The dataset used includes quarterly establishment-level data covering the period from January 2017 to December 2019, with a total of 12 observations for the majority of the 305 supermarkets in our cohort. Economic performance is a dynamic process, so the data need to be longitudinal. The minimum number of observations per supermarket is nine, and the average is 11.39, which mean our panel data are fairly well balanced.

### 3.2. Dependent variables

Academic research on supermarket performance focuses mainly on the operational side (i.e., processes, products, range, layout, and the supply chain) (Hernant et al., 2007; Kumar 2008; Pestana-Barros, 2006; Pestana-Barros and Sellers-Rubio, 2008; Saucède et al., 2014; Sellers-Rubio and Mas-Ruiz, 2006; Yu and Ramanathan, 2008). There is, nonetheless, a major research stream on service quality (Jain and Aggarwal, 2018; Kitapci et al., 2013; Min, 2010; Vella et al., 2009).

This research uses two common indicators to measure a supermarket's retail productivity (Friebel et al., 2017; Hortaçsu and Syverson, 2015; Nicasio, 2015; Vidya et al., 2015): SPSM and SPE computed on a quarterly basis. Additionally, supermarket performance is measured through service quality scores, which are also computed on a quarterly basis in each case. A number of models have been developed to conceptualise and measure service quality in the retail industry (Jain and Aggarwal, 2018; Kitapci et al., 2013; Min, 2010; Vella et al., 2009). The bulk of the studies have been adopted, modified, or informed by the SERVQUAL model (Parasuraman et al., 1988) to measure context-specific services (Jain and Aggarwal, 2018, Kitapci et al., 2013; Martinelli and Balboni, 2012; Martínez-Ruiz et al., 2010; Orel and Kara, 2014). These investigations have relied mainly on service quality ratings provided by customers. This research, by contrast, uses a dataset provided by a supermarket franchise company operating in Spain that includes quarterly unit-level data on service quality inspection scores. Among other aspects, these inspections assesses service convenience (i.e., the ease of accessing the supermarket and the suitability of payment methods), staff attitudes and efficiency (i.e., whether they are quick to respond to customers' needs, inquiries and complaints, informing customers about the services provided; whether they are engaged with their work, polite, courteous and well informed, and are never too busy to attend to customers' requests), reliability (i.e., customers' perceptions of how well the store fulfils its promises and how willingly the supermarket deals with returns, exchanges and complaints), cleanliness of the premises (i.e., internal and external hygiene, such as toilets, enter/exit signage, parking facilities, windows, doors, and shop front), tangibles (i.e., modern equipment, physical facilities, and store materials; the décor, the ease of locating merchandise and moving around; the proper maintenance of service-related equipment, ambient temperature and ventilation), and product policy (i.e., the quality of goods, and convenient parking and business hours). Service quality inspections are mostly conducted for internal purposes, and so they are usually treated as confidential, with this type of information rarely being disclosed. The supermarkets analysed here are inspected on a quarterly basis to assess their operational status on a scale of 0–100. The data on supermarkets' service quality are obtained through audits, which most supermarket franchise chains use to regularly evaluate their operational performance (Vázquez 2008). These audits consist of visits to franchised and company-owned units by franchisor representatives in order to verify the quality of inputs and products and compliance with the chain's standards. The supermarket chain in question here also uses these audits to rate establishment managers for incentives such as promotion and regular bonus plans, as well as for disciplinary measures. Moreover, these audits constitute an important communicational device because they serve both as a way of listening to franchisees' demands and prompting them to implement programmes organised by the supermarket chain (e.g., new products or new interior decoration).

### 3.3. Independent variable

The independent variable, namely, the supermarket's organisational form at the start of each quarter, takes a value of 1 for franchised establishments, and 0 otherwise. Hence, company ownership serves as the yardstick in our model.

### 3.4. Moderator variable

The impact of one moderator variable, namely, the gender of each individual supermarket's manager, is studied here to discover its effect on the relationship between organisational form and establishment performance. It takes a value of 1 when the supermarket is run by a female at the start of each quarter, and 0 otherwise. Thus, the male

gender is the reference in our model.

### 3.5. Control variables

Our model isolates the impact that both an individual supermarket's organisational form and its manager's gender have on the KPIs studied. The model also avoids spurious relationships between the dependent and independent variables, and includes 12 quarterly dummy variables and a set of control variables to account for the characteristics of the supermarkets and their local markets that may affect their performance. Specifically, the multivariate analysis includes two dimensions that typify each establishment demographically, such as size (measured by the total square metres of retail space at the beginning of each quarter) and age (measured by the number of years in operation, also at the beginning of each quarter). The multivariate analysis also includes two variables related to each local market, such as the number of supermarkets of any brand operating within a radius of 500 m around each establishment in the sample at the beginning of each quarter and the average net per capita income of the sub-city district (SCD)<sup>2</sup> in which each supermarket in the sample operates. Table 1 shows all the variables and their measurements, as well as their descriptive statistics, and Table 2 lists the correlations among these variables.

### 3.6. The model

We tested our hypotheses with a regression involving the moderating role of each manager's gender (female vs. male) on the relationship between the supermarket's organisational form (franchising vs. vertical integration) and the KPIs analysed (see Equation (2) below). An important concern in this model is sample selection bias. The idea that organisational decisions are endogenous to their expected performance outcomes is a recurrent issue in studies analysing the choice of governance mode (Masten, 1996; Shaver, 1998; Hamilton and Nickerson, 2003). Therefore, because supermarkets' organisational form is endogenous, such organisational choices are made systematically and not randomly, so standard ordinary least squares (OLS) estimates could lead to biased coefficients.

We addressed the potential for sample selection bias by endogenising the supermarkets' organisational form and estimating the performance equations through the application of an instrumental variable (IV) methodology. Heckman (1978, 1979, 1990) discusses how the performance equations can be estimated by standard two-stage least squares (or IV method) through the application of a linear probability model for the first stage. Specifically, we follow the methodology suggested by Papiés et al. (2017, pp. 616–617) to resolve the endogeneity issue when the endogenous variable is binary (in our case, supermarkets' organisational form). The first step involved estimating a treatment model to describe the self-selection decision (Equation (1)). The equation of interest (Equation (2)) was then estimated after being adjusted for self-selection from the first equation.

The treatment equation in this study is a probit model that predicts the probability of choosing a franchised supermarket or a vertical integrated supermarket as follows:

<sup>2</sup> Given the significant inequalities within cities in terms of net per capita income levels, the European Urban Audit project has considered the need to provide data for levels lower than the city as a whole. This level, called "Sub-City District" (SCD), corresponds to a subdivision of the city in zones that, in many cases, coincide with existing divisions into administrative districts or neighbourhoods. In Spain, these levels have been defined for all cities with more than 250,000 inhabitants. These SCDs must have a population of between 5000 and 40,000 inhabitants, a comparable size and internal homogeneity. Another principle that they must fulfil is that of spatial coherence; with clearly defined boundaries.

**Table 1**  
Descriptive statistics (by establishment).

Variable	Description	Mean	Standard deviation	Maximum	Minimum
Sales per square metre	Quarterly sales (in euros) of the supermarket per square metre.	1253.36	478.59	1931.81	804.22
Sales per employee	Quarterly sales (in euros) of the supermarket per employee.	48,863.82	15,735.34	64,995.04	36,529.55
Service quality scores	Quarterly assessment of operational aspects related to, among others aspects, service convenience (i.e., ease of accessing the supermarket, suitable methods of payment), employee friendliness and efficiency (i.e., if they respond quickly to customer needs, inquiries and complaints, informing customers when services will be provided; if they work with enthusiasm, and are polite, courteous and well-informed, never being too busy to respond to customers' requests), reliability (i.e., customers' perceptions of how well the store fulfils its promises and how willingly the supermarket handles returns, exchanges and complaints), facility cleanliness (i.e., internal and external hygiene, such as client toilets, enter/exit signage, parking facilities, windows, doors, and store front), tangibles (i.e., the modern look of equipment, physical facilities, and store materials; the décor, the ease of locating desired merchandise and moving around; the proper maintenance of service-related equipment, the environment, such as ambient temperature and ventilation), and supermarket policy (i.e., the quality of merchandise, and convenient parking and opening hours).	88.79	8.67	99.00	68.00
Franchising	Takes value 1 for franchised supermarkets, and 0 otherwise, at the beginning of the quarter.	0.57	0.50	1	0
Female management	Takes value 1 when the supermarket is run by a female at the start of each quarter, and 0 otherwise.	0.29	0.46	1	0
Distance	Geographical distance between each supermarket and firm headquarters (km).	198.72	169.65	596.43	0
Size	Number of square metres of retail area in the supermarket at the beginning of the quarter.	597.05	152.93	800	375
Age	Number of years in operation of the supermarket at the start of the quarter.	12.79	9.06	34.83	0.42
Competition	Number of supermarkets of any brand within a radius of 500 m around the supermarket at the beginning of the quarter.	3.68	1.86	9	1
Income	Annual average net per capita income in 2016 of the SCD where the supermarket operates.	11,378.13	3633.07	42,819	7277
	Number of observations	3473			
	Number of supermarkets	305			

**Table 2**  
Correlations among variables.

	1	2	3	4	5	6	7	8	9
1. Sales per square metre	1.00								
2. Sales per employee	0.27***	1.00							
3. Service quality scores	0.11*	0.13**	1.00						
4. Franchising	0.24***	0.21***	-0.17***	1.00					
5. Female management	-0.16***	-0.14**	0.20***	-0.17***	1.00				
6. Distance	-0.09	-0.07	-0.01	0.18***	0.04	1.00			
7. Size	0.18***	0.27***	-0.02	-0.14**	0.07	-0.02	1.00		
8. Age	0.08	0.04	-0.06	-0.07	-0.12**	-0.09	-0.08	1.00	
9. Competition	-0.16***	-0.19***	0.15***	-0.11*	-0.03	-0.07	-0.01	-0.05	1.00
10. Income	0.25***	0.21***	0.18***	-0.22***	0.16***	-0.01	0.04	0.07	0.15***

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

$$Franchising_i^* = \alpha_0 + \alpha_1 Distance_i + \alpha_2 Size_i + \alpha_3 Age_i + \alpha_4 Competition_i + \alpha_5 Income_i + v_i \tag{1}$$

where  $v_i$  is a random error term, and  $Franchising_i^*$  represents an underlying index of the supermarkets' organisational form. If  $Franchising_i^* \leq 0$ , then  $Franchising_i^* = 0$  and corresponds to company-owned supermarkets; if  $Franchising_i^* > 0$ , then  $Franchising_i^* = 1$  and corresponds to franchised supermarkets.

The econometric identification of Equation (1) requires introducing into the treatment regression at least one instrument not considered in the performance regression. We use distance between each supermarket and the franchisor's headquarters as the instrument for the supermarkets' organisational form. Theoretically, this variable should influence organisational form decisions, as it modifies monitoring costs. Specifically, agency theory predicts that those supermarkets closest to the franchisor's headquarters will be company-owned (e.g., Brickley and Dark, 1987). Statistically, these statements are corroborated in our data: distance from the franchisor's headquarters has both a positive and a

statistically significant impact on franchising in the first-stage regression (see Table 3). Additionally, there is no reason to believe that this distance directly influences the KPIs analysed. This was also corroborated

**Table 3**  
Probit model that predicts the probability of choosing a franchised supermarket or a vertically integrated one.

	Franchising
Distance	0.0026*** (4.5591)
Size	-0.0009*** (-3.8057)
Age	-0.0012 (-0.5720)
Competition	-0.0107*** (-2.9311)
Income	-0.0006*** (-2.7104)
Constant	0.6843*** (5.1867)
N	305

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

**Table 4**  
Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (SPSM).

	Model 1a	Model 1b (basic model)	Model 1c (interactive effects)
Franchising		0.0165*** (0.0032)	0.0214*** (0.0051)
Female management		-0.0083 (0.0083)	-0.0118 (0.0094)
Franchising × Female			-0.0088*** (0.0013)
Size	0.1583*** (0.0294)	0.1309*** (0.0218)	0.1469*** (0.0286)
Age	0.1027 (0.0842)	0.0798 (0.0534)	0.1603 (0.0727)
Competition	-0.1468*** (0.0269)	-0.1374*** (0.0285)	-0.1540*** (0.0231)
Income	0.3227*** (0.0486)	0.3479*** (0.0477)	0.3792*** (0.0505)
Constant	-1.265*** (0.1786)	-0.9682*** (0.1153)	-0.6978*** (0.1089)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.63	0.74	0.75

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

**Table 5**  
Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (SPE).

	Model 2a	Model 2b (basic model)	Model 2c (interactive effects)
Franchising		0.0140*** (0.0027)	0.0197*** (0.0028)
Female management		-0.0184 (0.0159)	-0.0234 (0.0251)
Franchising × Female			-0.0095*** (0.0017)
Size	0.2262*** (0.0281)	0.3033*** (0.0379)	0.2673*** (0.0316)
Age	0.0403 (0.0462)	0.0283 (0.0372)	0.0160 (0.0238)
Competition	-0.1032*** (0.0153)	-0.1244*** (0.0192)	-0.1149*** (0.0182)
Income	0.4174*** (0.0531)	0.3298*** (0.0481)	0.3527*** (0.0516)
Constant	3.4081*** (0.4516)	2.8495*** (0.3637)	3.1058*** (0.5350)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.66	0.76	0.77

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

empirically in our data, as this variable had no effect when we included it directly in the performance equations (see the results in the Appendix – Tables 4A, 5A, and 6A).

The main equation is as follows:

$$Y_{it} = f(F_i, G_{it}, F_i \times G_{it}, X_{it}, Z_i, \varepsilon_{it}) \quad (2)$$

where  $i$  and  $t$  denote establishment and quarters (1–12), respectively;  $Y_{it}$  is the log of the performance variables studied;  $F_i$  reflects each one's organisational form, treated as endogenous, whereby it can either be franchised ( $F_i = 1$ ) or vertically integrated ( $F_i = 0$ );  $G_{it}$  represents the gender of each individual supermarket manager, which in a particular quarter is either female ( $G_{it} = 1$ ) or male ( $G_{it} = 0$ );  $X_{it}$  stands for establishment and local market features that vary over time, and  $Z_i$  for those that do not. We also consider  $\varepsilon_{it} = \mu_i + \mu_{it}$  to be a composite error

**Table 6**  
Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (Service quality scores).

	Model 3a	Model 3b (basic model)	Model 3c (interactive effects)
Franchising		-0.0202*** (0.0031)	-0.0251*** (0.0046)
Female management		0.0152 (0.0160)	0.0114 (0.0098)
Franchising × Female			0.0099*** (0.0018)
Size	-0.0658 (0.0887)	-0.0445 (0.0689)	-0.0305 (0.0511)
Age	-0.1425 (0.1362)	-0.1197 (0.1504)	-0.0885 (0.1071)
Competition	0.0651*** (0.0098)	0.0798*** (0.0129)	0.0718*** (0.0114)
Income	0.2546*** (0.0320)	0.3061*** (0.0374)	0.2713*** (0.0344)
Constant	-0.3024*** (0.0443)	0.6432*** (0.0768)	1.0387*** (0.1238)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.54	0.61	0.62

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

term, where  $\mu_i$  stands for establishment-level unobserved heterogeneity, which we initially assume is not correlated with observed features, and  $\mu_{it}$  stands for an idiosyncratic error term. The variance-covariance matrix White/Huber estimator is used to correct the standard errors regarding potential heteroscedasticity (Kosová et al., 2013). All the continuous variables in our regressions are in logarithmic form.

#### 4. Results and discussion

The results of our regression analyses are displayed in Tables 4–6.

Firstly, the results in Tables 4 and 5 show that franchised supermarkets record higher SPSM and SPE than company-owned ones. The impacts of the franchising dummy variable on these KPIs are positive and statistically significant, as seen in Model 1b of Table 4 ( $\beta = 0.0165$ ,  $p < 0.01$ ) and Model 2b of Table 5 ( $\beta = 0.0140$ ,  $p < 0.01$ ), respectively. These results support H1, whereby franchisees are prompted to work harder than the managers of vertically integrated establishments (Rubin, 1978). Our findings are consistent with the fact that franchisees have higher incentives to monitor their employees, as the owner-manager's wealth is highly dependent on the establishment's financial success. Several studies support this argument in the franchising literature (Ackermann, 2019; Beheler et al., 2008; Krueger, 1991; Shelton, 1967; Sveum and Sykuta, 2019).

Our results also suggest that gender moderates the positive effect of franchising on both SPSM and SPE. The negative and significant coefficient of the interaction term *Franchising × Female* ( $\beta = -0.0088$ ,  $p < 0.01$ ), as shown in Model 1c (Table 4), indicates that the positive impact of franchising on SPSM is less intense in franchised supermarkets run by females than in those run by males. Similarly, the negative and significant coefficient of the interaction term *Franchising × Female* ( $\beta = -0.0095$ ,  $p < 0.01$ ), as presented in Model 2c (Table 5), implies that the positive impact of franchising on SPE is diminished in female-run franchised outlets. These results support H3, whereby female managers record a weaker performance than male managers when they operate in highly competitive settings (Gneezy et al., 2003; Shurchkov, 2012). As already explained, franchisees have a very competitive compensation scheme, as their own wealth depends largely on their establishment's performance (Rubin, 1978).

The findings also show that franchised supermarkets record lower

service quality scores than company-owned ones. The impact of the franchising dummy variable on this performance measure is negative and statistically significant ( $\beta = -0.0202, p < 0.01$ ), as seen in Model 3b (Table 6). This finding supports H2, which argues that as part of a chain, franchisees could free-ride on the brand, and therefore provide lower service quality than vertically integrated establishments (Brickley and Dark, 1987). Jin and Leslie (2009) and Michael (2000) support this argument in the hospitality industry.

The results also suggest that gender moderates the relationship between the organisational form of individual establishments and their service quality scores. The positive and significant coefficient of the interaction term *Franchising*  $\times$  *Female* ( $\beta = 0.0099, p < 0.01$ ), as shown in Model 3c (Table 6), indicates that the negative impact of franchising on service quality is less intense in female-run franchised supermarkets than in those run by males. These findings support H4, whereby gender differences in honesty, compliance, and overconfidence favour the greater fulfilment of the chain's quality standards by female franchisees compared to their male counterparts (Buccioli and Piovesan, 2011; Dreber and Johannesson, 2008; Karakostas and Zizzo, 2016; Niederle and Vesterlund, 2007).

Our results also show that increasing establishment size raises both SPSM (Table 4) and SPE (Table 5). Likewise, the increase in the number of supermarkets, regardless of the brand, within a radius of 500 m around each establishment reduces SPSM (Table 4) and SPE (Table 5), and increases service quality scores (Table 6). Finally, as the average per capita net income of the SCD in which each supermarket operates increases, SPSM (Table 4), SPE (Table 5) and service quality scores (Table 6) also increase.

## 5. Conclusions and limitations

A supermarket company's own data over the period 2017–2019 are used here to study the impact of two organisational forms, namely, company ownership and franchising, on establishment-level performance measured through three KPIs (SPSM, SPE, and service quality scores) commonly used in the supermarket industry. After controlling for establishment and local market features, franchised supermarkets record higher SPSM and SPE than company-owned establishments. We also found that franchised supermarkets record lower service quality scores than vertically integrated establishments.

Our findings also show that gender moderates the relationships between an individual supermarket's organisational form and the KPIs studied. Prior research has reported that females and males differ according to a series of individual traits and behaviours, such as a willingness to compete (Almås et al., 2015; Flory et al., 2015), honesty (Buccioli and Piovesan, 2011; Dreber and Johannesson, 2008), compliance (Karakostas and Zizzo, 2016), overconfidence (Niederle and Vesterlund, 2007), and many others (e.g., education, interests, objectives, work experience, attitude to risk, motivation for running a business, management style, and strategy implementation) (Burke and Collins, 2001; Dawson and Henley, 2015; Eagly and Karau, 2002; Schaap et al., 2008; Talbot, 2004). Female and male traits may differ, but they are equally valid (Fischer et al., 1993). These different traits and behaviours affect the ways the genders run businesses. Our findings have shown that franchised supermarkets run by females outperform those run by males in service quality scores. In contrast, our results show that female-run franchised establishments do not perform as well as those managed by males in SPSM and SPE, whereby the relationship between female management and performance differs depending on the performance indicator being considered. This does not in any way imply that female managers undermine business performance, and the related findings do not support theories of female underperformance (e.g., Bosma et al., 2004). We therefore contend that the supposed underperformance of female managers is not due to poor management skills, but instead can be attributed to the use of inappropriate performance measures, whereby females and males are expected to be just as effective managers

when proper measures of relative performance are used.

### 5.1. Research contributions

Our investigation adds to the franchising literature in the supermarket industry. This is the first article on the differences between franchising and company ownership in terms of SPSM, SPE, and service quality scores at establishment level in this industry. We have addressed this lacuna by examining the relationship between an establishment's organisational form and its performance estimated through KPIs commonly used in the supermarket management literature. We have found that franchised supermarkets record both higher SPSM and SPE than company-owned establishments, although the former record lower service quality scores. These mixed findings enable us to explain the diversity of results forthcoming on this issue in the franchising literature due to the variety of performance indicators studied.

Many studies have measured perceptions of service quality in the retail industry (Jain and Aggarwal 2018; Kitapci et al., 2013; Martinelli and Balboni, 2012; Min, 2010; Orel and Kara, 2014; Vella et al., 2009). These investigations have mainly used the assessment of service quality provided by establishment users. There are some issues with using these data sources because respondents often experience self-selection bias. Satisfaction scores may also be influenced by salient reference scores that are visible to the customer. Our research, however, uses a dataset provided by a large Spanish supermarket company. This company uses a control system to evaluate their establishments' performance on a regular basis. Given that this control system is conducted for internal purposes, and the generated data are usually treated as confidential in the organisation, this type of information is rarely disclosed.

This paper also contributes to the state-of-the-art on gender differences and performance. The relationship between managers' gender and supermarket performance has not been previously addressed. This paper is the first to use empirical evidence to test the influence of the manager's gender on supermarket performance. For instance, most empirical research in the field of gender differences in free-riding has relied on lab experiments (e.g., Andreoni and Petrie, 2008; Chermak and Krause, 2002), providing insights into causal structures with high internal validity. Our study complements previous research by exploring the issue of free-riding in a real-world context.

The literature on gender differences and firm performance mostly involves firms in general, and is not concerned with operations managers. In our case, franchisees and managers of company-owned supermarkets are the ones making the daily decisions at establishment level, not senior executives or board members. Although an analysis of the latter is important, a study of operation management is even more so, as supermarket managers and franchisees have a more direct influence on the KPIs considered. Academia should use operations metrics more often, looking beyond ratios and stock values. Performance indicators should be paired with the people that directly affect those indicators, without correlating performance measures with those with less control over such measures.

Many of the studies that have analysed the performance differences between franchised and company-owned establishments, and between male and female managers, have adopted a cross-sectional approach (Beheler et al., 2008; Jin and Leslie, 2009; Lawrence and Perrigot, 2015; Michael, 2000). This approach has several limitations and prevents capturing all the dynamics of the performance process. In our case, we have used a panel dataset with quarterly establishment-level data on individual outlets from January 2017 to December 2019, provided by a Spanish supermarket company.

Lastly, this research deals with the Spanish market. The selection of this specific market, which has a dynamic franchising sector, is consistent with the recommendations issued by Dant (2008) and Dant et al. (2008), who have stressed the importance of studying franchising issues in non-English-speaking markets.

## 5.2. Managerial and policy implications

This study has several implications for practitioners in the supermarket industry and for policymakers. Our research findings show that franchised outlets record higher SPSM and SPE than company-owned units. Our results also reveal that the latter provide a better service quality. Franchisors can avoid these performance differences by implementing more control mechanisms and incentives for both franchisees and managers of vertically integrated supermarkets.

Prior research has shown that female managers underperform male managers in highly competitive settings (Gneezy et al., 2003; Shurchkov, 2012). Franchisees have a more competitive compensation scheme than managers of company-owned establishments, so our results reveal that the positive influence that franchising has on both SPSM and SPE is more moderate in franchised supermarkets run by females than in those run by males. The negative impact franchising has on service quality is also shown to be less intense in female-run franchised supermarkets. This evidence is consistent with research showing gender differences in honesty, compliance, and overconfidence (Buccioli and Piovesan, 2011; Dreber and Johannesson, 2008; Karakostas and Zizzo, 2016; Niederle and Vesterlund, 2007), favouring stricter compliance with the chain's quality standards by female franchisees. In other words, females view their businesses as interconnected systems of relationships, as opposed to separate economic units (Brush, 1992). Hence, the issues of free-riding are reduced in franchised outlets run by females, so franchisors may prioritise female franchisees in those chains with a high risk of free-riding; for example, when a standardised brand image is important and when operational details and a high level of service quality are key to competitive advantage. Free-riding is one of the more pernicious factors for undermining brand reputation and threatening a franchise system's long-term survival. Safeguarding brand capital is therefore essential for the robustness of franchise systems (Brickley and Dark, 1987; Gillis et al., 2020; Kidwell et al., 2007; Michael, 2002).

When service quality is very important for the outlet, franchisors should therefore choose female applicants for franchised supermarkets or use company-owned outlets (vertical integration). However, when productivity is a crucial factor, franchisors should choose male applicants for franchised supermarkets. In other words, supermarket franchisors seeking to attract customers that value service quality should understand that this will be better provided if their establishments are vertically integrated or if the franchised stores are run by females. Our findings support this recommendation. The results in Table 3 reveal that the probability of an establishment being franchised (instead of vertically integrated) decreases as the average per capita net income of the local market increases. High-earning supermarket customers are more likely to value service quality, merchandise quality, and a pleasant shopping experience (Baltas et al., 2010). In contrast, low-income consumers tend to travel further in search of better deals (Fotheringham and Trew, 1993). Consumers with limited income shop around to secure the best value-for-money (East et al., 1997; Mägi and Julander, 2005). A negative relationship between customer income level and the number of stores patronised has been observed (Baltas et al., 2010), as lower-income shoppers have less opportunity cost in the sense that the time spent on shopping is less of a sacrifice (Ratchford, 1982). A lower income therefore raises the need to shop around for better prices and deals (Fox and Hoch, 2005). When a supermarket operates in a local market in which potential customers have low incomes, it is important to have low prices, and it should therefore be franchised because franchisees have more incentives to work harder than managers of vertically integrated ones, leading to greater efficiency and productivity, and lower operating costs.

Our results also suggest that the shortage of female leaders in many industries is more than simply a social issue, as it also involves shareholders; in other words, having females in management is the right thing to do socially, as businesses also perform better, or at least no worse, when they have females at the top. Therefore, companies should

empower females in their roles as managers. Consequently, our findings support the decisions made by Pepsi and Target, for example, with their Future Fund initiative for a 50/50 distribution of leadership roles (Wells, 2018), and encourage other companies to follow suit by applying this type of parity initiative; that is, the glass ceiling blocking females from management on the grounds that they might perform badly needs to be removed (Pizam, 2017).

Our findings provide a compelling rationale for continuing to work at improving the status of females in society and in the workforce by, for example, empowering them to reach the highest levels within their organisations. As females are often responsible for their family as well as for their job, they are directly influenced by a country's family policies, such as the provision of day care or parental leave. For example, a regulation on paid parental leave that requires an equitable distribution between parents can encourage females to improve their participation in the labour market. Appropriate health and welfare policies are also needed, including sickness and maternity benefits.

Public policies should also focus on females' equal access to resources, particularly business education and finances, whereby they can develop the skills required for a successful business start-up. For example, public administrations could promote both formal and informal learning experiences for females, mentoring programmes, and cooperative education schemes and internships. Also important are training policies aimed at educators or official agencies that should organise instruction, or at bankers and others who should raise awareness and highlight the particular needs of female entrepreneurs. For example, it is very important to train bank loan officers to prevent them from inadvertently discriminating against females.

## 5.3. Limitations and future research

The results and conclusions of our research should be considered in terms of its shortcomings, given that our empirical setting specifically involves a franchise chain belonging to a large Spanish supermarket company. Although the focus on this franchise chain in a given country allows controlling for external effects, it negatively affects the results' validity. Another shortcoming involves the limited number of performance variables and time periods examined, which mean our outcomes cannot be generalised. In view of these weaknesses, additional investigation is required to discover whether the outcomes hold more generally for other KPIs, and whether our results are valid for other supermarket chains, other industrial sectors, and other territories. For instance, future research should investigate whether female involvement positively or negatively influences different performance indicators in franchise chains, and in what context or under what conditions females record positive or negative results. Scholars should therefore explore various moderating or mediating variables that may provide a more realistic take on the link between gender and performance. By so doing, we could provide more precise management implications and useful advice for businesses.

A further limitation of this article is that we do not have information on the price of the items sold in the supermarkets. We know that prices are systematically different in corporate and franchised units because franchisees and franchisors may have different views on what the optimal prices are at a given outlet (Ater and Rigbi, 2015; Kalnins, 2003; Kosová et al., 2013; Lafontaine, 1999; Lafontaine and Slade, 1997; Vroom and Gimeno, 2007). Ater and Rigbi (2015) have recently reported that the average price of the Big Mac meal (and other non-reported meals) at franchised outlets is higher than the corresponding average price at corporate outlets. Barron and Umbeck (1984) and Slade (1998) have looked at the effect on prices of legally mandated divestitures (i.e., before and after studies). Muris, Scheffman, and Spiller (1992) also conduct a before-and-after study focusing on the temporal effect on retail prices of soft-drink manufacturers' decisions to buy back some of their bottles. Other studies look at the effect of contract type on prices in a cross-section of contracts under circumstances where no



regulatory or market forces are pressuring upstream firms to change their ownership structure (Shepard (1993); Graddy (1997); Lafontaine (1999)). All of these studies find evidence that prices do indeed differ, and that in corporate units they are in fact slightly below those in franchised units. Therefore, two of our KPIs, SPSM and SPE, could be affected by the higher prices of franchised establishments compared to vertically integrated ones. However, the effect of an establishment's price level on SPSM and SPE is not evident, and may positively or negatively affect both KPIs, as a supermarket's turnover depends on both the price level and the quantity of products sold, and the latter increases as the prices of the products sold decrease.

This study has been conducted in Spain, where cultural values might not have a major impact on gender diversity. Some comparative perspectives and different findings will probably be forthcoming if similar studies are carried out in those countries where sociocultural features may limit female involvement in certain occupations. The "culture" component arguably has one of the most profound impacts on females. Studies on entrepreneurship in the Middle East, Africa, and some Asian

countries, for example, have shown how culture has disadvantaged females by preventing them from owning a business due to religion or societal norms, or prioritising their role as wife and mother over any other to which they may aspire (Roomi, 2013). Extending the research to these topics would provide additional insights into our existing knowledge of female managers.

**Declaration of competing interest**

None.

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**Appendix**

**Table 4A**

Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (SPSM).

	Model 1a	Model 1b (basic model)	Model 1c (interactive effects)
Franchising		0.0163*** (0.0032)	0.0211*** (0.0052)
Female management		-0.0086 (0.0079)	-0.0133 (0.0096)
Franchising × Female			-0.0087*** (0.0013)
Distance	-0.0031 (0.0051)	-0.0016 (0.0027)	-0.0023 (0.0035)
Size	0.1603*** (0.0287)	0.1324*** (0.0224)	0.1462*** (0.0291)
Age	0.1104 (0.0710)	0.0746 (0.0471)	0.0981 (0.0776)
Competition	-0.1422*** (0.0272)	-0.1391*** (0.0293)	-0.1516*** (0.0243)
Income	0.3240*** (0.0491)	0.3522*** (0.0481)	0.3820*** (0.0511)
Constant	-1.306*** (0.1816)	-1.0243*** (0.1165)	-0.7183*** (0.1113)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.63	0.74	0.75

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

**Table 5A**

Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (SPE).

	Model 2a	Model 2b (basic model)	Model 2c (interactive effects)
Franchising		0.0137*** (0.0028)	0.0201*** (0.0029)
Female management		-0.0179 (0.0162)	-0.0234 (0.0251)
Franchising × Female			-0.0093*** (0.0017)
Distance	-0.0009 (0.0017)	-0.0028 (0.0041)	-0.0012 (0.0027)
Size	0.2273*** (0.0284)	0.3024*** (0.0385)	0.2684*** (0.0322)
Age	0.0388 (0.0421)	0.0267 (0.0381)	0.0197 (0.0263)
Competition	-0.0997*** (0.0165)	-0.1197*** (0.0198)	-0.1122*** (0.0188)
Income	0.3958*** (0.0552)	0.3324*** (0.0488)	0.3631*** (0.0521)
Constant	3.3720*** (0.4608)	2.9379*** (0.3751)	3.2302*** (0.5537)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.66	0.76	0.77

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

**Table 6A**

Moderating role of gender in the relationship between organisational form (treated as endogenous) and log (Service quality scores).

	Model 3a	Model 3b (basic model)	Model 3c (interactive effects)
Franchising		-0.0198*** (0.0033)	-0.0256*** (0.0047)
Female management		0.0146 (0.0151)	0.0107 (0.0094)
Franchising × Female			0.0103*** (0.0019)
Distance	-0.0006 (0.0007)	-0.0003 (0.0004)	0.0001 (0.0001)
Size	-0.0641 (0.0906)	-0.0467 (0.0709)	-0.0319 (0.0526)

(continued on next page)

Table 6A (continued)

	Model 3a	Model 3b (basic model)	Model 3c (interactive effects)
Age	−0.1504 (0.1217)	−0.1156 (0.1470)	−0.0910 (0.1103)
Competition	0.0633*** (0.0105)	0.0879*** (0.0144)	0.0741*** (0.0129)
Income	0.2617*** (0.0342)	0.3128*** (0.0401)	0.2803*** (0.0375)
Constant	−0.2859*** (0.0493)	0.4571*** (0.0662)	0.7306*** (0.1050)
Quarterly dummy variables	YES	YES	YES
Observations	3473	3473	3473
Number of supermarkets	305	305	305
R <sup>2</sup>	0.54	0.61	0.62

Significance levels: \* 10%, \*\* 5%, \*\*\* 1%.

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