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Food retailer price convergence: the case of Tijuana, Mexico

Convergencia en los precios de minoristas de alimentos: el caso de Tijuana, México

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ABSTRACT

The objective of this study is to compare prices across ten food categories sold by four large food retail chains in Tijuana, Baja California, Mexico. The data was collected through mystery shoppers across a seven-month period. The analysis consisted of descriptive statistics and analyses of variance (ANOVA). The results suggest that the retailers in the study apply similar prices across ten food categories. This is one of the few studies conducted in the region to address food price convergence in the retail sector. The conclusion is that price convergence takes places among large retail chains in Tijuana. The main limitation of the study is the geographic focus. The implications are that retailers find themselves struggling to differentiate based on price, and end up making unsupported claims around lowest-price value propositions. Future studies can argue whether price convergence limits consumer choices or keeps prices in check.

Keywords: 1. retail, 2. food, 3. prices, 4. Tijuana, 5. Mexico.

RESUMEN

El objetivo de este estudio es comparar los precios de diez categorías de alimentos que se distribuyen en cuatro cadenas minoristas en Tijuana, Baja California, México. El acopio de datos se llevó a cabo mediante reportes de cliente misterioso a lo largo de siete meses. El análisis se basa en estadísticas descriptivas y análisis de varianzas (ANOVA). Los resultados sugieren que los minoristas aplican precios similares en diez categorías de alimentos. Ésta es una de pocas investigaciones llevadas a cabo en la región sobre este tema. Se concluye que los precios de alimentos en cadenas minoristas convergen. La principal limitante del estudio es su enfoque geográfico. La implicación es que los minoristas compiten con base en precio, pero sin sustentar esta propuesta de valor. Futuras investigaciones podrán argumentar si la convergencia en los precios limita las opciones de los consumidores o si mantiene el precio de alimentos bajo control.

Palabras clave: 1. comercio minorista, 2. alimentos, 3. precios, 4. Tijuana, México.

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INTRODUCTION

The integration of Mexico into the global economy and adoption of neoliberal economic policies are creating an environment where retail chains overwhelm local, traditional food sellers, which could have unforeseen, negative social effects (Harner, 2007; Gasca & Torres, 2014). Consistent with previous research (Uhl & Brown, 1971), this study aims to advance consumer knowledge regarding food prices across large retail chains that operate in Tijuana, Baja California. In doing so, they may reward food retailers that provide them with the best value for their money. In this regard, the study will benefit food retailers as well. It is assumed that making an accurate assessment of the price-quality relationship can be cumbersome and costly for consumers, which lead to the present research.

In this study, price information from four retail chains operating in the city of Tijuana, Baja California, Mexico, is examined. This is in line with suggestions for future research on price fixity set forth by Richards and Patterson (2005), and greater use of techniques traditionally used in marketing (e.i., mystery shopper tactics) to better understand food purchase decisions (Unnevehr, et al., 2010). The data consists of secret shopper reports containing price information across ten food categories. The term mystery shopper refers to the data gathering technique often used in retail settings to assess store performance through observation (Johnson, Houmanfar, & Smith, 2010). Since the four retailers in the sample compete on a platform of low prices, average category prices were compared to determine whether there are significant price differences that consumers should consider. With this information, consumers could inform their choices to decide whether: (1) to buy their food from one retailer, (2) to shop around competing retailers, or (3) to assess food retailers on factors other than prices. The results from this study may also serve retail managers who are planning on designing their value propositions based on objective market intelligence.

PROBLEM STATEMENT

In the cities of Tijuana and Mexicali, the consumer price index was among the highest for the food, drink, and alcohol categories, second only to transportation (Instituto Nacional de Estadística y Geografía, 2017). Meanwhile, the retail industry in Baja California accounts for 10.2% of GDP (Secretaría de Economía, 2018), which sheds some light on the important size and impact of food retailers in the region. In spite of inflation, food consumption has remained steady, benefitting the industry as a whole (MarketLine, 2018). To support their growth strategy, modern food retailers in Mexico are targeting poor segments of the population who used to buy food from traditional retailers, basing their sales propositions on the promise of lower prices (MarketLine, 2015).

Given that the capacity to buy food is of great importance to the public, it is a valid goal to raise awareness and understanding among consumers of the dynamics involved in food distribution. After all, Mexican consumers have already suffered through price increases on food as a result of globalization (Chávez Martín del Campo, Villarreal Páez, Cantú Calderón, & González Sánchez, 2009; Torres Torres, 2010; Avalos, 2016); new taxes on sweetened beverages (Colchero, et al.,

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2015); and climate change (Hawkes, 2012; Álvarez Gordillo, Araujo Santana, & Arellano Gálvez, 2018).

The negative effects of food increases appear in the high levels of food insecurity and accompanying disease among the most vulnerable segments of the population (Mundo-Rosas, Shamah-Levy, & Rivera-Dommarco, 2013). Not to mention the fact that healthy food choices are available at higher prices than unhealthy products (Mendoza Velázquez, 2012), giving people an incentive to purchase unhealthy foods. Part of the logic behind free markets is that customers can choose where to buy and save money by comparing prices. However, the large and complex assortment of products offered by large food retailers, and the influence of their advertising messages, makes it hard for the consumers to make informed choices.

FOCUS OF THE STUDY

The focus of the study is on the state of Baja California, specifically in Tijuana. This city has a population of 1 641 570 (Instituto Nacional de Estadística y Geografía, 2018a), and borders the state of California, United States. The sample consists of 96 food stores from four retail chains. While explaining the dynamics involved in setting food prices is challenging and requires the analysis of several criteria, this study will focus on examining price convergence among food retailers. For the purposes of this study, price convergence refers to the use of uniform pricing across competing sellers (Grether, 1941). The analysis in this research involves comparing food prices, on average, among four large retail chains over a seven-month period in Tijuana.

This approach is justified because food retailers in other places have been known to compare and match prices to remain competitive in the eyes of their customers, creating a marketplace where food prices are standardized, giving consumers little choice to shop around to save money (Boynton, Blake, & Uhl, 1983). Giulietti's (2007) research in Italy suggests as much. It is reasonable to assume this practice takes place in Baja California, but after an extensive review of the literature, no studies on the subject were found. This research should help narrow this information gap.

REVIEW OF THE LITERATURE

Market dominance of large food retailers

The growth of modern retail chains over the past few decades has been apparent in Latin America (Gasca & Torres, 2014). In Mexico, especially among some of the poorer parts of the country, this trend will continue over the following years (MarketLine, 2015). Research on the matter is relatively scarce, but academics in the fields of economics and marketing are making important contributions. For example, Flexor (2014) analyzed how the expansion of these large retailers

would affect small food retailers in Brazil. He noted that small retailers were not prepared to compete with the retail chains because of limited infrastructure and negotiation power with suppliers. In his conclusion, Flexor (2014) warned that it was important for the government to support these small businesses because the retail chains tended to focus on the metropolitan areas, leaving the residents of peripheral regions underserved. This void, he said, was filled by the small food sellers.

In Mexico, small food retailers have an important economic and societal role. In the state of Baja California, Mungaray, Ramírez, Aguilar, and Beltrán (2007) analyzed the market position of microbusinesses. These businesses sold different types of foods in marginalized areas in the two largest cities of the state: Tijuana and Mexicali. Mungaray et al. (2007) concluded that microbusinesses maintained their market shares even though their prices tended to be higher than those of large retail chains that operate in the region. The explanation behind this counterintuitive finding was that consumers respond to different stimuli, not just prices, when selecting food sellers. Still, modern food retailers tend to design their marketing strategies around low price propositions (MarketLine, 2015).

Gasca and Torres (2014) noted that the technological, logistical, and economic changes that have taken place in Mexico since the 1940s, in terms of food distribution, suggest an increased dependence on modern, large food retailers. According to Business Monitor International (2018), food sales in Mexico will increase by 8.2% in the near future. The compound annual growth rate (CAGR) for the food retail industry in the country is estimated to be 4.6% for the 2017-2022 period (MarketLine, 2018). Mexicans are spending approximately 25% of their income on food. Modern supermarket chains drive the market, pushing out small food sellers (MarketLine, 2015).

Retail pricing approaches

Retailers may use several criteria to determine the price of the goods they sell. Duan, Mao, and Hou (2018) noted that retail prices for store brands, for instance, depend on production costs, and shelf opportunity cost. Their research served retailers interested in developing their own store brands and corresponding marketing strategies based on their relationships with manufacturer category leaders. Consistently, Coughlan and Shaffer (2009) considered the impact of available shelf space on pricing decisions, along with product variety. Their study concluded that the presence of large retailers, with less restrictive shelf-space, can more readily allow sellers to implement price matching guarantees or other marketing tactics that can lead to better terms enjoyed by consumers.

Other factors that affect retail prices include those examined by Shugan and Desiraju (2001) who explained how variations in the cost of components or ingredients affect consumer prices for end products, and how retailers can react to changes in wholesale prices. Their analysis revealed that asymmetric prices take place at the retail level when dealing with high- and low-quality items. For example, when the price of electrical components used in building low-end computers rise,

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these computers should reduce their prices, while high-end computers that use alternative, higher quality components, should raise their prices.

Stout and Hawkins (1968) studied the factors that affect pricing of meat products. They noted that storage costs, the use of distribution centers, organization structure, purchasing agent negotiations with suppliers, the application of discounts, and the selection of pricing formulas all play a role in the price paid by consumers. Similarly, Arana Coronado, Bijman, Omta, and Oude Lansink (2015) noted that avocado food packers in Mexico were able to improve performance and competitiveness by integrating their relationships with producers (suppliers) and distributors (clients). In this way, their marketing programs included both purchasing and selling operations. The result was a better priced, better-quality product. All of these factors make the process of setting prices more complex, but more effective.

However, research conducted by Alves , Varotto, and Gonçalves (2012) suggests that retailers simplify the process by focusing on traditional costing methods aimed at achieving marketing goals, which is not usually the most effective way to establish prices. Binkley and Connor (1998) realized the changing nature of retail pricing strategies when they examined factors that influenced dry and perishable food category pricing. They noted that factors like fixed operational costs had little effect on food prices at the retail level, but increased rivalry from emerging store formats served to keep prices down. In contrast, Nijs, Srinivasan, and Pauwels (2007) argued that retailers cannot be sure of the competitive strategies their competitors will actuate, so retailer rivalry has little effect on pricing strategy. The researchers noted that pricing history, wholesale prices, and brand demand are the key drives of retail pricing. In the case of Mexico, customers favor low price and low quality products since the start of the modern retail organizations in the country (Ewing, 1962).

Price convergence

As early as 1940, research conducted in California, United States, suggests that retailers were using uniform pricing strategies on their top selling items (Grether, 1941). Bingham (1950) documented the argument in favor of allowing grocery manufacturers to implement uniform pricing strategies across consumer segments. Among the benefits associated with manufacturer uniform pricing, Bingham (1950) listed lower prices, reduced administrative stress, and standardization of national advertising media. There is additional evidence of the interest on pricing schemes at the food wholesaler level. Rodríguez-Feijoó, Rodríguez-Caro, and González-Correa (2015) examined the fruits and vegetables wholesale market by examining long-term pricing behavior in one large distributor. The authors concluded that prices tend to be flexible, but steady, and the fluctuations are mostly due to specific product circumstances.

From the retailer perspective, Richards and Patterson (2005) examined scanner data on fruit sales in the United States. They noted that prices across retailers tend to be fixed. Further analysis

led these researchers to conclude that price fixing takes place because retailers intend to prevent retaliatory pricing strategies on the part of their rivals. However, given some of the concerns associated with price uniformity, namely the enabling of oligopolistic practices, Elegido (2011) argued that price discrimination practices represent a viable and ethical alternative.

To avoid having customers leverage their knowledge on food prices across retailers, food sellers may engage in price convergence. Lamm (1981) studied price structure relationships in the food retail industry and noted that there was enough evidence to suggest that price convergence was associated with food seller concentration. Anders (2008) reached a similar conclusion after analyzing the food retail market in Germany, and Giulietti (2007) noted that there were visible similarities in pricing among modern retail chains in Italy. The issue is that the standardization of entire food systems, not to mention the distribution side of it, can alienate people who value alternatives and the ability to make a choice regarding food sellers (Follett, 2009). The logic behind this argument is that price convergence creates an environment where retailers provide less diversity to their customers by engaging in tactics that lead to increased similarities across food vendors.

Gasca and Torres (2014) documented the rise of the modern retail industry in Mexico. They noted that joint ventures, facilitated by the integration of Mexico into the global economy, the consolidation of regional food retailers, and the sophistication of logistical and marketing practices, created a situation where a relatively small number of distributors have been able to reach large sections of the population. Even the previously ignored marginalized sectors of the population are now being targeted by the national chains (MarketLine, 2015). This means that large retailers have a greater opportunity and responsibility to serve Mexican consumers than ever before.

Besides offering products to their customers at competitive prices, retail managers need to ensure that consumers perceive their offerings adequately. There is evidence in the literature of efforts made by retailers to manage price perceptions and measure promotional effectiveness (Folkes & Wheat, 1995; Heath, Huber, & He , 2001). Lee and Lee (2011) argued that customers who are less knowledgeable of specific consumer product categories benefit from the use of competitive advertising. Given this information, it makes sense for retail managers to inform their customers about their market offerings, including price information. However, in a highly competitive environment, consumers may use this information to shop around and force retailers to drop their prices. Price convergence helps retailers avoid or minimize the likelihood of customers leveraging information to influence retailer pricing strategies.

Consumer response to marketing tactics

Binkley and Chen (2016) examined scanner data from over 200 000 households in the United States to narrow the gap in the literature regarding grocery-shopping patterns. They concluded that consumers could save money by shopping across food retailers or by searching through products within one low-price food seller. Evidently, buying from one retailer implies less work on the part

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of the consumer, but Binkley and Chen (2016) argued that consumers engage with different retailers for reasons other than saving money. Their conclusions are consistent with previous research conducted based on the idea that price is a complex matter, and its influence on consumer behavior is not clear-cut (Lichtenstein, Ridgway, & Netemeyer, 1993).

For example, Zeithaml (1988) argued that some consumers would rather focus on time and effort spent on buying groceries than on prices. Moreover, there is evidence in the literature that suggest that supermarket customer loyalty decreases when consumers pay closer attention to prices (Torres Moraga, Hidalgo Campos, & Farías Nazel, 2007; Díaz & Rondán Cataluña, 2011). Retailer switching is especially noteworthy on the northern border region in Mexico, where consumers can travel a short distance into the United States to gain access to competitively priced consumer goods, thereby circumventing price increases in Mexico (Díaz González & González-König, 2016). In spite of the efforts made by researchers to understand the effect of prices on consumers' choices in Mexico, Díaz and Rondán Cataluña (2012), who analyzed consumer behavior by collecting point of purchase data from consumers, argued that there continues to be a need to examine consumer buying behavior to determine the influence of promotions, pricing tactics, branding, and consumer culture.

One suggestion is that grocery retailers may attract consumers through non-price strategies, which means food sellers do not have to rely exclusively on pricing schemes to stay in business. For example, Rodrigues Feijó and Botelho (2012) conducted a study with one retailer as a control group and another one as the experiment group. The authors arranged for the experiment group to implement merchandising strategies that included the use of furniture, and price and merchandise displays. The control group made no changes. The results from the study suggest that the implementation of merchandising strategies influenced retail store income.

Along with the introduction of non-price variables, another important issue emerged. Hawkes (2008) noted that supermarkets, through their location, assortment, and pricing strategies, have an important influence over consumer food choices. Since retailers are businesses concerned primarily with enlarging their market share, they may have an incentive to feature low-price items regardless of the health implications. This is a reason for concern in Mexico. Research on retail marketing suggests that large food sellers will use price reductions and other in-store marketing tactics to promote unhealthy foods (Cohen, Collins, Hunter, Ghosh-Dastidar, & Dubowitz, 2015). After the financial crisis of 2008, Mexico experienced an increase in food prices that mainly affected the poorest segments of the population by forcing them to spend most of their income on restocking food, and having to make trade-offs between purchasing healthier food items or more affordable, unhealthy meals (Torres Torres, 2010).

This concern was echoed by Aragón Gutiérrez, Ramírez Valverde, Montero Simó, Araque Padilla, and Pérez Barea (2018) when they found that consumers in Mexico place greater importance on food quantity and price than on nutritional value. Their finding was based on survey

data regarding amaranth purchase intention. Aragón Gutiérrez et al. (2018) concluded their study by calling for future research that would lead to improve marketing tactics aimed at promoting better food choices for consumers in Mexico.

The practice of comparative marketing communication, where retailers compare own and competitor prices using receipts or other mechanisms, has come into question in terms of its effectiveness and fairness to the consumer (González Vaqué, 2012). This type of marketing strategy is usually used to communicate value propositions based on low prices. In Mexico, this type of positioning is the most prevalent among food retailers that claim to have a price advantage over competitors (MarketLine, 2015). There are, however, examples where advertising and promotion strategies aim to help supermarket shoppers develop better eating habits. Moore, Pinard, and Yaroch (2016) noted that sales promotions and advertising are viable strategies for creating awareness among consumers about healthy food choices within supermarkets. Therefore, although marketing communications serve retailers interested in communicating low prices, the same tactics can be used for creating awareness and branding of products directed at less price-sensitive customers.

Retailer pricing and competition

Schlegelmilch and Öberseder (2010) reviewed 50 years of publications on marketing ethics. Among several important areas for further research, they noted the persistent need to address issues regarding marketing to the poor, paying close attention to pricing and advertising practices. This is an important issue in Mexico, considering that retail chains are growing by targeting the poorer sections of the population who used to purchase their groceries from street vendors (MarketLine, 2015). Retail chains tend to be in a favorable position to offer lower prices to their customers. Hirsch (1956) compared food basket prices across large, medium, and small retailers, and found that larger retailers offered lower prices. However, the expansion of large retailers in countries like Mexico may actually lead to less competition. The development of mass merchandising concentrated greater control of the food supply on the retailer, leading food producers to accommodate buyer specifications (Collins & Jamison, 1958). This situation is exacerbated when one retailer acquires another, which reduces local supplier or producer power and shifts greater influence to larger retailers (Collins & Burt, 1999; Gasca & Torres, 2014).

Boynton et al. (1983) studied consumer response to retail price comparisons. In their study, a 100-item basket across retailers was published so consumers could identify price differences per item. Surprisingly, this had little effect on consumer choices. Boynton et al. (1983) attributed this to retailers making price adjustments in response to the publication. Retailers who noticed that their prices were above the market average tended to make adjustments to remain competitive, while low-price retailers kept track of average prices and made sure that they remained at the lower end of the spectrum.

This was consistent with the work of Alves et al. (2012), who studied the goals behind retailer pricing strategies. They concluded that retailers set prices primarily based on profit expectations,

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and secondly in terms of the aim of remaining competitive in their markets. One way to manipulate prices is with price-based promotions. Rajagopal (2008) argued that the large retail chains in Mexico attract new customers and stimulate brand loyalty with point of sale promotions. Since these promotions are typically advertised, it makes sense for competing food sellers to adjust their efforts accordingly.

Given this brief review of the literature on the factors that influence the way in which food sellers compete, the following alternative hypotheses are set forth:

> **H1**: Food retailers in the sample set significantly different average prices at the category level.
>
> **H2**: Food retailers in the sample set significantly different average prices over time.

The null hypothesis in each case (H_0) rest on the lack of statistically significant differences.

METHOD

This quantitative study was conducted using a sample of four retail chains in Tijuana, Baja California, Mexico (Table 1). One of these retailers, identified here as the Focal Retailer, provided access to the mystery shopper reports created by the market research department of the company. Businesses use mystery shoppers to generate data that informs decision-making that leads to improved performance (Johnson et al., 2010; Krevor, Ponicki, Grube, & DeJong, 2011; Latham, Ford, & Tzabbar, 2012). These reports contain price information at the product level on the four retailers in the study. These retailers operate several locations throughout the city. In all, the four retail chains in the sample (one focal retailer and three competing retailers) accounted for 96 establishments in Tijuana. Taken together, there are 1,079 self-service stores in Tijuana (Instituto Nacional de Estadística y Geografía, 2018b).

Price information from 10 food categories was analyzed. The categories included in the study are listed in Table 2. The data were collected through mystery shoppers who visited one location for each retail chain in the study once a week over a period of eight months in 2016 (March – October). Prices were standardized across stores, so it was not necessary to visit more than one store per retail chain. After the data cleaning phase, the original dataset was reduced due to incompatible data. The incompatible data appeared mostly due to out of stock products at one store or another. The cleaning phase resulted in a final dataset of 2 216 observations distributed across the 10 food categories (see Table 2), and the elimination of the entire month of June. Therefore, in the end, price comparisons included seven months in 2016. This approach allowed for comparisons of same week and same product prices across the four retailers in the study. For the sake of simplicity, product level information was grouped into their corresponding categories. For

example, fruits and vegetable products were grouped into the produce category; milk and cheese were grouped in the dairy category, and so on.

Table 1. Sample Food Retailers in the Study

Retailer	Number of stores	Description	Reach
Focal Retailer	50	Traditional supermarket	Regional
Competitor 1	33	Traditional supermarket	National
Competitor 2	9	Hypermarket	National
Competitor 3	4	Hypermarket	Multinational
Total	96		

Source: Developed by the author with data from Instituto Nacional de Estadística y Geografia (2018b).

The final dataset consisted of 2 216 observations, which were used to conduct the appropriate analyses. One-way analysis of variance (ANOVA) were calculated, for each of the 10 food categories, twice to address H1 and H2. First, mean prices by category were compared across the four retailers. Second, mean prices at the category level were compared across the seven months of data. One-way ANOVA is used to compare variations in averages among samples - between group variance (BGV), and variations within individual observations - within group variance (WGV) (Jaeger, 1983). The alpha level for statistical significance was set at ≤ .05. The equation can be expressed as follows:

$$F = \frac{BGV}{WGV} = \frac{\sum_j^k (\bar{X}_j - \bar{X})^2 / (n-k)}{\sum_j^k \sum_j^l (\mathrm{X} - \bar{\mathrm{X}}_j)^2 / (k-1)} \qquad (1)$$

Where $\overline{\boldsymbol{X_J}}$ is the sample mean of the j^{th} group, and $\overline{\boldsymbol{X}}$ is the overall mean, $\boldsymbol{k}$ is the number of groups and $\boldsymbol{n}$ is the number of observations. Note that in the double sum in the denominator, the internal sum is for the within the group, and the external sum is to add the sums all together.

Pearson correlations, which range from -1 to 1, were calculated across retailers in the sample using prices at the category level to determine negative (r ≤ -.30), positive (r ≥ .30) or no relationship (r close to 0) among the variables in the groups. A positive correlation would indicate that prices rise or decrease across retailers together, suggesting price convergence. Alpha levels were set at ≤ .05. The equation can be expressed as follows:

$$r = \frac{\sum_i (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_i (x_i - \bar{x})^2} \sqrt{\sum_i (y_i - \bar{y})^2}} \qquad (2)$$

Where **r** is the Pearson correlation coefficient, $\overline{\boldsymbol{x}}$ is the mean for the first sample and $\overline{\boldsymbol{y}}$ is the mean for the second sample.

The entire analysis phase was assisted with the statistical package for the social sciences (SPSS), version 23.

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Table 2. Food Categories and Corresponding Observations

Category	Observations	Percentage
Produce	666	30.1%
Deli	94	4.2%
Meats & Fish	273	12.3%
Dairy	213	9.6%
Breakfast	331	14.9%
Meals	372	16.8%
Grains	36	1.6%
Drinks & Snacks	163	7.4%
Frozen goods	40	1.8%
Bread & tortilla	28	1.3%
Total	2 216	100%

Source: The data were developed by the author.

RESULTS

The first part of the analysis consisted in running descriptive statistics and ANOVA test on prices across the four retailers. The null hypothesis assumed no statistically significant differences among the groups:

$$H_0: \mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu k \quad (3)$$

Where μ1 = focal retailer price, μ2 = competitor 1 price, μ3 = competitor 2 price, μ4 = competitor 3 price, μk = 4 groups in the sample.

Results from the ANOVA test reveal that there were no statistically significant differences, at the category level, across the participating retailers (Table 3). Pearson correlations determine the existence of statistically significant relationships among prices across the four retailers in the sample. The results noted in Table 4 suggest that retailer food prices positively correlate, which is consistent with the results from the ANOVA tests noted on Table 3. The high correlations noted in Table 4 support the claim the retailer food prices converge. At this point H1 was rejected.

Table 3. Mean Price and Standard Deviations at the Category Level Across Competitors

Category	N	Focal Retailer (Pesos)	Competitor 1 (Pesos)	Competitor 2 (Pesos)	Competitor 3 (Pesos)		
		M(SD)	M(SD)	M(SD)	M(SD)	F	P
Produce	666	21.77 (11.83)	24.83 (13.50)	26.35 (16.50)	23.47 (13.28)	.86	.45
Deli	94	60.63 (31.96)	59.43 (32.41)	56.24 (30.00)	57.57 (32.18)	.01	.99
Meats & Fish	273	83.59 (48.80)	86.78 (51.03)	85.18 (49.30)	86.84 (51.18)	.01	.99
Dairy	213	43.74 (37.93)	42.08 (35.52)	40.66 (34.35)	41.19 (36.25)	.02	.99
Breakfast	331	30.08 (16.94)	30.08 (15.39)	29.62 (14.94)	29.24 (15.17)	.01	.99
Meals	372	15.21 (9.01)	15.92 (9.20)	16.09 (9.92)	15.52 (9.18)	.04	.98
Grains	36	18.95 (3.81)	18.80 (4.64)	18.89 (5.00)	16.93 (4.20)	.02	.99
Drinks & Snacks	163	57.68 (62.22)	56.60 (58.20)	60.17 (62.23)	59.54 (62.23)	.009	.99
Frozen goods	40	20.44 (18.42)	18.54 (17.01)	17.75 (16.43)	18.11 (14.50)	.05	.98
Bread & tortilla	28	6.54 (3.76)	6.67 (3.66)	6.08 (3.71)	6.31 (3.61)	.006	.99

Note: Prices expressed in 2016 Mexican Pesos.
Source: The data were developed by the author.

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Table 4. Average Retailer Price and Pearson Correlations

Retailer	N	Mean (Pesos)	Pearson correlations			
			Focal Retailer	Competitor 1	Competitor 2	Competitor 3
Focal Retailer	2216	35.66	1.0			
Competitor 1	2216	36.77	.97	1.0		
Competitor 2	2216	36.96	.96	.96	1.0	
Competitor 3	2216	36.18	.97	.97	.97	1.0

Note 1: Mean prices expressed in 2016 Mexican pesos.
Note 2: All Pearson correlation p values <.001.
Source: The data were developed by the author.

Once it was determined that retailer food prices across the four retailers in the sample showed no statistically significant differences within at the category level, and that prices positively correlate, it was necessary to determine whether these findings applied regardless of the month in which the data was examined. To that end, ANOVA tests were used again, only this time to compare same month data across retailers. Once again, the results suggest no statistically significant differences (see Table 5). Based on this finding the second hypothesis (H2) was rejected.

$$H_0: \mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu k \qquad (4)$$

Where μ1 = March prices, μ2 = April prices, μ3 = May prices, μ4 = July prices, μ5 = August prices, μ6 = September prices, μ7 = October prices, μk = 7 months in the sample

Table 5. Mean Price and Standard Deviation by Month across Competitors

Month	N	Focal Retailer	Competitor 1	Competitor 2	Competitor 3		
		M(SD)	M(SD)	M(SD)	M(SD)	F	P
March	464	$35.17 (35.69)	$36.23 (34.95)	$36.69 (35.89)	$35.16 (35.48)	.40	.75
April	318	$36.00 (38.60)	$37.33 (37.10)	$37.32 (37.25)	$36.90 (37.73)	.07	.97
May	356	$34.89 (35.47)	$36.16 (35.53)	$35.99 (35.52)	$35.67 (36.06)	.09	.96

July	428	$35.37 (38.37)	$36.12 (38.25)	$35.65 (37.01)	$35.44 (39.73)	.08	.96
August	219	$39.08 (44.58)	$39.72 (43.16)	$39.85 (43.40)	$39.23 (44.41)	.19	.89
September	112	$35.19 (43.17)	$36.08 (35.80)	$36.14 (34.23)	$35.07 (35.84)	.00	.99
October	319	$35.11 (31.66)	$36.74 (33.72)	$38.11 (34.58)	$36.84 (34.27)	1.31	.33

Note: Prices expressed in 2016 Mexican Pesos.
Source: The data were developed by the author.

DISCUSSION AND AREAS FOR FUTURE RESEARCH

The results from this study suggest that food prices converge among the four retail chains in the sample. Pearson correlations and ANOVA analyses suggest as much. The implications are that consumers have a narrow choice when it comes to selecting food sellers based on price, and that claims about lower prices disseminated through retail advertising should be scrutinized. While evidence of uniform food prices is not new (Grether, 1941), this is the first time a study has been conducted using retailer data to corroborate this type of claim within the Baja California region. Moreover, the reasons and implications of this trend deserve to be analyzed. Perhaps the most logical explanation about why prices converge came from Alves et al. (2012), who noted that retailers tend to use similar, simple pricing methods. This explanation suggests a lack of intentionality on the part of retailers, which is possible. Nonetheless, other potential explanations should be considered through future research. These are discussed as follows.

Boynton et al. (1983) noted that retailers engage in market intelligence activities to compare their food prices with those of their competitors. In response to perceived differences, the retailers modify their prices to ensure competitiveness. As noted before, the source data for this study was mystery shopper reports provided by the Focal Retailer. Therefore, it can be assumed that retailers keep track of competitor prices and use that information to plan their commercial strategy. Of course, common sense dictates that adjustments are not simply made at the point of sale. It is not a stretch to imagine that food purchasing agents leverage their market intelligence to renegotiate with suppliers, re-calculate profit margins at the product or category level, or diversify their product assortments.

Research on food retail conducted in Sweden examined the relationships between retail purchasing agents (or buyers) and suppliers in terms of achieving “triple bottom line” goals (Chkanikova, 2016). The study concluded that purchasing agents should engage in activities designed to enlist supplier collaboration with retailer strategic goals. Such activities may include creating incentive programs for retailers or developing partnerships for launching new products. The need to understand the nature of retail buyer-supplier relationships becomes clear with the realization that purchasing agents often pursue several objectives with their choice of suppliers (Shaw, Dawson, & Blair, 1992). Future research in the retail food industry in Mexico and other

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places in the region should examine the relationships between purchasing agents, producers and distributors to uncover their mutual goals, challenges, and priorities. Also, given the results of this study and since purchasing agents across competing retailers tend to share some of the same suppliers, it would be interesting to learn whether suppliers serve as sources of market intelligence to competing retailers. A study designed to address such matters may be placed right on the ethical boundary (e. i., suppliers commenting on their business dealings with purchasing agents across competing retailers), so researchers who decide to engage in the topic would be well advised to take every ethical measure available to protect their subjects, and observe institutional review board guidelines.

Another potential influence on price convergence may be the role of manufacturers in providing suggested retail prices to consumers. Manufactured products often include list prices aimed at consumers, which customers use to determine whether the prices retailers charge for their products are in line with the market (Lubensky, 2017). As noted before, obtaining current and accurate price information across retailers can be cumbersome for consumers (Hirsch, 1956; Cotterill, 1986). To the extent that food manufacturers can facilitate this task, retailers may have less freedom to set their own prices. Little information is available on the matter, so future research on efforts made by manufacturers to provide list prices, and their influence on consumers buying choices is encouraged.

In line with the work developed by Moliner Velázquez and Berenguer Contrí (2011), future studies should examine a wider spectrum of variables than price. The authors argued that retailers use a variety of tactics as part of their marketing strategy. These tactics include the use of rewards programs, convenience amenities like ample parking, and extended service hours. While the present study suggest that food prices converge at the category level, even though the marketing communications strategy centers around the promise of low prices, it is possible that customers appreciate non-price variables. If this were to be confirmed, retailers could modify their value propositions to differentiate themselves from their competitors, and perhaps gain credibility with their customers.

The final area for future research presented here involves the nature of the geographic region itself. Díaz González and González-König's (2016) contribution to the study of retail prices was already noted in this study. Consumers along the United States-Mexico border can leverage their ability to travel back and forth between the two countries to obtain better deals on all types of goods and services. It would be interesting to examine how food retailers on both sides of the border deal with this fact, and implement strategies to attract cross-border customers.

In this regard, retail managers benefit from this study. By having documented evidence of price convergence across retailers in the sample, decisions to improve market intelligence and evaluate value propositions may be justified. It is important to consider that, at times, members of an organization may believe their own narratives, so it makes sense that retailers who claim to provide

lower prices to their customers may overlook evidence that contradicts this notion. At the very least, this study should give retail managers in Tijuana cause for pause and consideration on the matter.

CONCLUSION

This study was conducted to address questions regarding food retailer choices for customers. Specifically, whether retail customers should purchase their food from one retailer, whether they should purchase different food products from a variety of retailers, or whether they should focus on factors other than price when it comes to shopping for food. The assumption guiding this study was that price convergence takes place with large food retailers in the sample. The results suggest that price convergence takes place among the four retail chains in the sample. Consumers and retail managers benefit from the study because it allows them to make adjustments regarding where they buy, in the case of consumers, or how they conduct their business, in the case of the retail managers. With this in mind, consumers should purchase their food from retailers that provide them with better non-price benefits like convenience, services, ambience, and so on. Also, consumers should be careful with price-based promises used by retailers in their advertising. Perhaps a better source of market price information can come from the food manufacturers themselves, when available. The point is that consumers who buy their food from retailers in Tijuana are probably paying the same regardless of retailer selection or price-based claims used in supermarket advertising. For their part, retail managers can start developing relevant non-price value propositions that appeal to their customers.

Price convergence is not necessarily bad or good for consumers. Moving away from the potential dangers of oligopolistic practices, which hardly apply in this case given the large amount of specialty stores, and emerging food retail chains in the region under study (MarketLine, 2015), price convergence can be effective in keeping food retailers in check. It is certainly appealing for customers to have a sense of being treated fairly when they pay for their food at the supermarket, instead of having to wonder whether they could have gotten a better deal elsewhere. On the other hand, consumers tend to want choices, so the matter stands for debate.

The findings presented here come from the analysis of a large dataset that covers price information from four retail chains operating in Tijuana, Baja California, Mexico. The application of these findings is not recommended in other parts of the world. In fact, the main limitation of the study is its geographic focus. It is likely that some of the national retailers involved here use different processes in other parts of the country where they face a different set of competitors, and different consumer characteristics. Another limitation that is worth noting is the fact that the original dataset was larger than the final version used in the analyses. The dataset had to be cleaned and reduced to 2 216 to ensure matching samples. Although it is unlikely this impacted the outcome of the study, given its conclusive correlations and ANOVA results, the reader should understand this limitation. The final limitation has to do with timeliness. Although trends in retail tend to be steady, for the most part, the data under analysis correspond to seven months in 2016,

since then, the composition of the retail industry in the region under study could have gone through some changes like the rise of new retail chains positioning under low price propositions.

Hopefully, this study will help future research on retail marketing and food prices in Baja California and other places in the region. While the findings presented here may have been somewhat predictable, the contribution of the study in helping to fill the research gap on retail food prices is clearly significant and helpful for businesses, consumers and researchers. Perhaps, regional researchers will give more mind to the role of food retailers in their communities. Specially in places like Baja California where the cost of food is especially high, and modern retailers continue to claim a larger share of the market.

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