The Impact of Macroeconomic Events on Marketing Relationships

Abstract:

This paper addresses one issue that has been somewhat neglected in the marketing literature. Namely, whether basic marketing relationships at the establishment level are robust to major changes in the macroeconomic environment where they operate. What allows us to address this issue is a combination of two factors: passage of a law liberalizing retail gas prices in Spain and the availability of a survey of gas stations in Pamplona focusing on customer satisfaction and future patronage intentions prior to the passage of the law. By conducting a similar survey in 2007 we were able to ascertain the extent to which the main determinants of these two important marketing outcome variables were robust to the macroeconomic changes of the intervening years. While the main attributes or distribution services determining customer satisfaction were inter-temporally stable, customer perceptions of store price levels were not. In the case of future patronage intentions, only customer satisfaction was an inter-temporally stable determinant of the relationship. Important customer characteristics and objective characteristics of the establishments had different effects on future patronage intentions before and after the price liberalization.

KEYWORDS: Retailing; Customer Satisfaction; Gas Stations; Future Patronage Intentions; Price Liberalization.

INTRODUCTION

When economies in transition, developing countries and even developed ones engage in price liberalizations consumers are expected to be among the main beneficiaries of these processes (Boycko 1992; Li 1999; Kostova and Johnson 2004). From a perspective closer to the marketing field, it is hypothesized that the elimination of market distortions implicit in the market reforms, enhances the proportion of firm budgets allocated to marketing efforts and supplier-customer-channel service improvement (Carman and Domínguez 2001). In these terms, the consequences of a market liberalization is a central macromarketing issue as the de-regulation of an industry has immediate consequences on the marketing system by enhancing the competitive behavior of firms (Hunt 2011).

In this paper we take advantage of a unique opportunity to provide empirical evidence on how one major piece of deregulation processes -price liberalization- actually affects consumers in terms of two important outcome variables marketing scholars have focused on: namely, customer satisfaction and future patronage intentions. For the evaluation of the legal reforms or public policies on marketing systems, customer satisfaction and loyalty are the two basic pillars to be measured and analyzed. From a service perspective, the output is co-created by sellers and customers together so that satisfied customers and sellers remain loyal to each other (Betancourt et al. 2007; Lusch and Webster 2011). As such, satisfaction is the value co-created by companies and consumers in the marketing system and can only be determined by the perceptions in use among the citizenry of public and private offerings (Lusch and Vargo 2006). Also, satisfaction is relevant because it is a direct determinant of consumer well/being in the marketing system (Lee et al. 2002).

Our objective is to answer the following questions relevant to the macromarketing interest: Does price liberalization influence the satisfaction and loyalty levels of consumers? - Does price liberalization alter the effect of marketing instruments on satisfaction and loyalty? The analysis focuses on gas stations where the price of gasoline was initially fixed by the government, but the prices of other products or services at the station were determined by market participants. This focus makes our results especially relevant to the multi-product setting that is typical of retailing environments (e.g., Betancourt 2004, Ch.5).

This investigation is pertinent for all model specifications that include a direct effect for product price on customer satisfaction (e.g., Huddleston, et al. 2009) whether or not there is an additional separate effect on the performance or intervening variable of interest. Fortunately, specifications that include only a direct effect of price on performance, or on intervening variables, with no effect through satisfaction are few (e.g., van Doorn and Verhoef 2008). In any included model specification a fundamental question addressed is whether or not product price liberalization affects customer satisfaction directly or only indirectly through changes in its other main determinants.

With respect to future patronage intentions, the same issue also arises. Namely, does product price liberalization affect future patronage intentions directly or only indirectly through changes in its other main determinants? The implications of the results for this outcome variable, however, are more limited, since they need not apply to other performance variables such as profits or market share. Thus, we present the results for this variable more succinctly.

In the case of retailing, pricing and its competitive effects are sufficiently important to warrant a survey defining research opportunities (Kopalle et al. 2009). In this survey, specific mention is made of the difficulty faced by researchers in measuring store price level. Our

approach provides an alternative measurement mechanism by using surveys to indicate perceived store price level.

Prior literature on both outcome variables as well as the conceptual framework adopted and the specific research questions addressed are discussed in the next two sections. Subsequently, we describe the empirical design, specific macroeconomic setting and the two data sets relied upon in our study. The latter section sets the stage for a presentation of the empirical implementation of the concepts used and the estimation procedure. A brief summary of preliminary results on the basis of descriptive statistics from the variables identified in our analysis is followed by an in depth discussion of our main results. For simplicity of exposition, we analyze customer satisfaction first and subsequently future patronage intentions. We conclude with a summary of contributions, implications and limitations.

BRIEF REVIEW OF LITERATURE ON RELEVANT MARKETING RELATIONSHIPS

Customer satisfaction is usually viewed as a means to an end and the end can be an economic performance variable other than future patronage intentions. These have included, for example, the rate of return on investment (Anderson, Fornell and Lehman 1994) and Tobin's q (Anderson, Fornell and Mazvancheryl 2004). More recent literature has extended the possibilities even more by considering its effect on other outcomes viewed as intervening variables, for example advertising or efficiency (Luo and Homburg 2007). In a spatial marketing setting, at the aggregate level of trade areas, Ingene (1983) suggests that the same factors which influence the level of expenditures also influence the level of satisfaction in the same direction. These considerations enhance the importance of our results for this outcome variable, since they can be relevant for many settings.

The services marketing literature has frequently analyzed the formation of satisfaction and future purchase behavior (see Brady et al. 2005 for a comprehensive literature review). Generally speaking, perceived value (e.g. Oliver and DeSarbo 1988; Bolton and Drew 1991; Chang and Wildt 1994) or the difference between perceived service quality and expectations (e.g. Bearden and Teel 1983; Anderson and Sullivan 1993; Oliver, 1993) are considered the main determinants of both outcomes.

Service attributes are important determinants of both perceived service quality and value. In the literature, there are different approaches to their measurements. Within one approach, some authors use a general evaluation that is valid across very different contexts. Examples are a global quality measure (Anderson and Sullivan 1993), evaluations of technical and functional quality (Grönroos 1984; Bell, Auh and Smalley 2005) or, the evaluation of the five general dimensions in SERVQUAL scale (Parasuraman Zeithaml and Berry 1988). These scales are useful in comparing different industries but, at the same time, they make difficult the gathering of information about the interaction with the consumer in the co-creation process (Bitner, Booms and Stanfield-Tetreault 1990) or about the differences on consumer demand for the different service elements and their relationship with the retailers' costs (Bettencourt 1997).

A second approach considers specific attributes that are relevant within a particular service context (e.g. Chang and Wildt, 1994; Mittal, Ross and Baldasare 1998; Bearden and Teel, 1983; Spreng et al 1996). This second approach is more useful in order to show the interaction process between customers and retailers but makes difficult the generalization of results.

Finally, literature on transactions costs (Betancourt and Gautschi 1988) provides a suitable framework in this analysis that can be easily extended to different context and industries. This transaction costs framework has been applied in service marketing literature mainly in order to explain store choice (Bell, Ho, and Tang 1998; Smith and Brynjolfsson 2001; Chintagunta,

Chu, and Cebollada 2012). Consumer transaction costs may be conceptualized at the same time as distribution services that impact the service encounter result. They can be assigned to five broad categories: accessibility of location, information, assortment (breadth or depth), assurance of product delivery (in the desired form or at the desired time), and ambiance (Keh 1997; Betancourt 2004). This approach allows the analysis of services productivity (Sellers, Rubio and Nicolau 2009) and their impact on store results (Barber and Tietje 2004; Betancourt et al., 2007).

A recent overview paper on retailer pricing and competitive effects (Kopalle et al. 2009) states "…a key component of the output of retailing is a set of services,…". It goes on to add that the latter provide benefits to consumers and affect their willingness to pay for the explicit products sold by retailers. Thus, the first and perhaps most important element of the customer satisfaction relationship we will address is the inter-temporal stability of these services in determining satisfaction with gas stations. Similarly, in the case of future patronage intentions we will focus first on the inter-temporal stability of the effect of customer satisfaction. In both marketing relationships these variables are usually the ones most directly subject to managerial control at the establishment level.

One standard practice in the literature on customer satisfaction is to control for characteristics of consumers, including their perception of prices of a product or set of products, that may affect customer satisfaction with an establishment. Thus, the second element of the relationship we will address is the inter-temporal stability of customer characteristics in determining customer satisfaction. We will do the same for the determinants of future patronage intentions.

Finally, an issue that has not been pursued as systematically in the literature on customer satisfaction in retailing is the extent to which objective characteristics of the establishment, and in particular its competitive environment, have a direct effect on customer satisfaction. We will

address the inter-temporal stability of these objective characteristics in determining satisfaction. By contrast and not surprisingly, objective characteristics of establishments have received attention in the future patronage intentions literature (e.g., Seiders et al. 2005; Sirohi et al. 1998). Thus, we will also investigate the inter-temporal stability of this third element of the relationship for future patronage intentions.

CONCEPTUAL MODEL

The approach described in the previous section integrates the framework previously applied to manufacturing with attributes of the distribution sector that have been applied to supermarkets (Betancourt et al. 2007). Relaxing the assumption that the demand for distribution services equals the supply of these services, allows the application of the same conceptual approach to customer satisfaction in manufacturing to firms or establishments in the retail sector. Furthermore, under the same assumptions made in previous empirical analyses of the retail sector (i.e., the use of a standard of pleasure or displeasure as argued by Oliver 1999), this integration is suitable for empirical implementation with typically available survey data.

In this approach, customer satisfaction is inversely related to the gap between the demand for distribution services by customer i and his/her perception of the supply of distribution services provided by establishment k. That is, Dd (i) - Ds (i, k), where D is a vector of distribution services that corresponds to various attributes of the establishment or firm. These distribution services will be indexed by j. Characteristics of customers that patronize an establishment other than their perceptions of attributes or distribution services (X (i, k)), but including their perceptions of price, and objective characteristics of establishments (X (k, k)) can also affect customer satisfaction. They correspond to the three types of variables used in the retail literature as the main determinants of customer satisfaction.

Continuing the tradition of empirical literature on customer satisfaction in retailing, we will assume that customers´ demand for a distribution service, j, is never satisfied and is always at its maximum, M, which is the same for all consumers. Thus, consumer i satisfaction with a gas station, k, can be described by a relation of the following form

$$S_i(k) = f\{[M - D^s(i, k)]_j, X(i, k), X(k, k)\} \quad (\mathbf{1})$$

where $S_i(k)$ is a measure of customer satisfaction. In (1) satisfaction is viewed as a decreasing function, $f_j' < 0$, of the distance between each of the j distribution services actually provided by station k, $D^s(i, k)$, as perceived by the consumer, and the maximum level of each of the j distribution services demanded by consumer i, M. This specification allows us to address our basic questions. Does passage of the law and associated macroeconomic events affect the levels of customer satisfaction and its main determinants? Does passage of the law change the relationship between customer satisfaction and its determinants?

Future patronage intentions, P (i, k), by a consumer, i, with respect to an establishment, k, are determined as a function of customer satisfaction, Si (k), and a set of controls capturing characteristics of consumers that patronize an establishment (Z (i, k)), including perceptions of prices charged by the establishment, and objective characteristics of the establishments (Z (k, k)). These capture the main type of variables used in the retail literature as determinants of direct effects on future patronage intentions. Thus we address the same basic questions about future patronage intentions as we do for customer satisfaction with the following specification

$$P(i, k) = h[S_i(k), Z(i, k), Z(k, k)] \quad (\mathbf{2})$$

Finally, we summarize the discussion of the conceptual framework presented here with the following figure.

INSERT FIGURE 1 ABOUT HERE

THE EMPIRICAL DESIGN, MACROECONOMIC SETTING AND DATA

Empirical design

One difficulty in analyzing price liberalizations and their effects, or any other one-time event, is that they are usually accompanied by other changes at the same time. These one-time events generate two possible outcomes. Either one observes no changes in the characteristics or relationships of interest after the event or one observes changes in them. In the former case, it is very unlikely that the event had an effect on these characteristics or relationships and that everything else changed in just the right way to offset the change induced by the event. Thus, the argument that the event had no effect is usually convincing in and of itself. In the latter case, however, any observed change may also be due to the other things that were changing at the same time. Hence, it is impossible to conclude solely based on this evidence that the change was due to the event. Since evidence of inter-temporal stability or no change in a relationship is of significance in any scientific endeavor and it is more straightforward to identify, it will be emphasized in our subsequent discussion.

A characteristic of our particular retail industry controls for one of the important features that can change after price liberalization, namely the nature of the physical product subject to the price control. The gasoline products subject to price control remain the same before and after the price liberalization. Having the same physical products before and after the event makes the argument that this event had no effect more convincing. Furthermore, it eliminates an important

factor that could have changed from having an effect on any changes observed after the price liberalization.

We also control for two other important aspects that can change after the price liberalization, i.e., the location and capital stock of the establishment, trough the design of our study. There we compare the impact of price liberalization on customer satisfaction and future patronage intentions for exactly the same subset of establishments and we check for major changes in their physical characteristics. This subset of establishments was limited in the adjustments they could make to the price liberalization by their prior choices of location and physical facilities. We view the results of these comparisons as short-run effects, i.e., when location and the capital stock are fixed. In economics the general definition of the short-run is a "period" when at least one input is fixed (e.g., Varian 1987). In the context of retailing, however, it makes sense to insist on location as one of the inputs that has to be fixed given the importance of this variable in determining outcomes (e.g., Ingene 1983; Jones and Simmons 1993; Gonzalez-Benito, Muñoz-Gallego and Kopalle 2005).

The macroeconomic setting

The price liberalization process at the retail level is part of the evolution of the petroleum industry in Spain. The Spanish gasoline market was highly regulated for many years (Correljé 1990). Various aspects of an opening transition process started as early as the mid 1980's and accelerated in the 1990's (Contín, Correljé and Huerta 1999), at about the same time as in some other countries (Clements, Jung and Gupta 2007). Small regional differences in retail prices (less than 1% at the province level), however, only begin to appear in 1998 after the law liberalizing gas retail prices was passed October 1998, effective the following day. In the spring of 1998, before this law was passed, we undertook a survey of consumers regarding their satisfaction with

gas stations and future patronage intentions in Pamplona.

Since 1998 noticeable differences in prices have appeared within the city. For instance, in the spring of 2007 observed differences in prices at gas stations within Pamplona's beltway ranged from 5% for unleaded premium to 7% for diesel. We undertook a survey of gas stations in Pamplona in the spring of 2007 to ascertain consumer satisfaction with gas stations as well as its effect on future patronage intentions in this new liberalized environment. This survey, in combination with the earlier one, provides an unusual opportunity to examine the inter-temporal stability of these marketing relationships.

Many changes were taking place in Spain between 1998 and 2007. In particular, this period was one of great prosperity for the Spanish economy and Navarra shared in this prosperity. Pamplona is Navarra's largest city. For instance, according to Spanish National Statistics Institute (Instituto de Estadística, 2012) during this period the rate of growth of GDP in Spain was 3.8% whereas in Navarra it was 3.7%. Similarly, unemployment in Spain decreased by 14% between 1995 and 2006 (Bentolila, Dolabo and Jimeno 2008) while in Navarra it decreased by almost 18% between1998 and 2007. This nine year gap has one effect on our analysis. It accentuates the need to concentrate on identifying inter-temporal stability or those aspects of these marketing relationships that are not affected by the passage of the law and the associated macroeconomic changes, since both the effects of the law and the macroeconomic changes had ample time to affect the behavioral relationships in nine years.

The data

Our 1998 data set consists of surveys of customers at eight gasoline stations in Pamplona. Consumers were selected for interviews upon arrival at the gas station during one week in the spring of 1998. The survey was designed over a period of a month. The interviewers were trained

in one meeting; their instructions were printed in the first page of the survey; and they were asked to fill the surveys themselves. Five interviewers were assigned to each station, spaced over the day, each day of the week. These surveys generated a total of 280 observations. Eliminating the station that went out of business by 2007 reduces the overall sample of observations in 1998 by 29 observations, leaving us with 251 observations.

In 2007 our data set consists of surveys of customers at the seven gasoline stations from 1998 that survived the passage of the law. Consumers were selected for interviews upon arrival at the gas station during the spring of 2007. This survey was designed as a slightly modified version of the one used in 1998. In terms of the questionnaire: we added two entirely new questions; we split two old questions into two components; and we eliminated an earlier one completely. See the data appendix available on the web for details. Just as before, the interviewers were trained in one meeting, their instructions were printed in the first page of the survey, and they were asked to fill the surveys themselves. In contrast to the 1998 survey, however, two interviewers were assigned to each station and the interviews were spaced over the day but over two weeks. We obtained 265 observations over the seven stations in 2007.

At the time of the 1998 survey the seven surviving stations were 41.2% of the universe of gas stations within Pamplona's beltway. By 2007 they were 29.17% of this universe. Supplementing the survey data, we also gathered information on objective characteristics of the gas stations. One set of these measures tried to capture competitive conditions facing each establishment. A second set of these measures tried to capture objective conditions of the gas stations that could affect customer satisfaction or future patronage intentions. They are also described in detail in the data appendix. Most of the information on these variables was gathered

in both 1998 and 2007 since interviewers were asked to record objective characteristics of the station in both years.

EMPIRICAL IMPLEMENTATION

Measures

From the data described above we constructed a data set to use in our empirical analysis that had the same seven gas stations in the same location in both years. We also examined the data gathered on the objective characteristics of these stations to see if there had been major changes that would lead these stations to be substantially different in both years. While there were some changes in two cases, we would not call them major. In one case, the change allowed an increase in the number of cars that could be handled by the station simultaneously from 8 to 9 and in another case, it allowed a decrease in the number of cars that could be handled by the station simultaneously from 10 to 8.

Both outcome variables of interest were measured on the same scale in the 1998 and the 2007 surveys. $S_i(k)$ represents consumer's i satisfaction with station k or the dependent variable in equation (1). It was measured as the answer to the following question, on a scale of 0-10. – What is your degree of satisfaction with the services provided and the purchases made at this station? P(i, k) represents future patronage intentions or the dependent variable in equation (2). It was measured as the answer to the following question, also on a scale zero to10. - Will you put gas in this station in the future?

In the analysis of customer satisfaction, there are three types of variables used as explanatory variables or direct effects. One type is referred to as distribution services or simply services or attributes of establishments as perceived by consumers. A second type is consumer characteristics in which we will include their perception of the prices of the products offered by

the establishment relative to other establishments of the same type. A final one is objective characteristics of the establishment. In the analysis of future patronage intentions we can also classify the explanatory variables into three types: customer satisfaction; customer characteristics (other than satisfaction of course), and objective characteristics of the establishment. Thus, we will discuss below distribution services, customer characteristics and objective characteristics of the establishment. Customer satisfaction has already been defined above in the context of its use as a dependent variable.

Distribution services have been assigned to one of the following five broad categories by the sources cited earlier: accessibility of location, information, assortment, assurance of product delivery, and ambience. Measurement of these five services at the level of the establishment has been undertaken for supermarkets (Betancourt et al. 2007) and hardware stores (Barber and Tietje 2004). We followed their procedures with minor changes to adapt them to the context of gas stations.

Consumers were asked to rate on a scale of 0-10 a number of attributes that corresponded to (or at least correspond to an explicit dimension of) the five distributions services identified above. Given that the maximum in the measurement scale for these services was a 10, we introduced these services in the customer satisfaction equation as [10 – D (i, k)j]. Notice that an increase in [10 - D (i, k)j] implies a lowering of the level of the jth distribution service as perceived by the consumer. Hence, it should result in a lower level of customer satisfaction because the distance between the quality or level of service offered and the one expected has increased. That is, we expect a negative or at least non-positive sign for each of these five variables in equation (1). In general these variables are subject to managerial control.

By contrast the next set of variables refers to customer characteristics that are not subject to managerial control with one important exception. That is demographics and customer buying

habits are not generally viewed as subject to managerial control. Customers perceptions of prices of products are (e.g., Briesch et al. 1997). We have included them in this second type for two reasons. First, given our focus on the passage of a law allowing prices to be set by market participants, they merited special attention and it facilitated the exposition to treat them in this group. Second, prices and their perceptions are frequently viewed as distinct from services because the latter are not explicitly priced in most circumstances.

General demographic characteristics of consumers were included as controls, although we had no expectations as to how or if they would affect customer satisfaction or patronage intentions in terms of their signs. In particular we obtained and used information on: gender, age, position in the life cycle, and extent of work outside the home. We also included a variable that captured on a scale of 0-10 whether consumer perceptions of prices at the establishment relative to other establishments were high.

Similarly, four objective and three subjective characteristics of customers buying habits were used in various versions of the empirical analysis. The four objective ones were: the length of stay at the station, the size of the average purchase at the station, the frequency of gasoline purchases at the station, and the inter-purchase time of gasoline in days. The three subjective ones reflect attitudes toward purchasing gasoline products. They were: preferences toward pumping your own gasoline; the importance of reducing time spent on this activity, and, inclination to search for alternative stations when making this type of purchase.

The third type of variables included resulted from our gathering data on a variety of objective characteristics of gas stations that could help identify important changes between 1998 and 2007. The main one relating to competitive aspects was, for example, the number of gas stations within 5 kilometers of each of the gas stations in the sample. With respect to objective conditions of the gas station itself we considered, for example, whether or not self-service was

available, the number of cars that could be serviced simultaneously by the combination of hoses, pumps and aisles available at the station, displays of information on prices, number of aisles, and the price of diesel. Note that these variables only vary across stations.

We include a Statistical Appendix with a table of descriptive statistics that provide means, standard deviations, maxima and minima for all the variables mentioned in this section. This table also includes differences in the means between years as well as the t-ratio of a test of these differences for all these variables.

Empirical model

For estimation purposes we want to ascertain the effects of allowing gasoline retail prices to be determined by market participants after the passage of the law on the relationship between the explanatory variables (which we will label X* to capture the ones used in either equation (1) or equation (2)) and the dependent variable (which we will label Y to capture the dependent variable in either one of the two equations to be estimated). A simple exposition of the basic considerations underlying the procedure we will follow in the study is available (e.g., Gujarati 1970; Greene 2007).

We can write our estimation equation as

$$Y = \beta X^* + \delta D X^* + U \qquad (3)$$

where Y is a column vector of all i observations on a dependent variable. In the study the 1998 ones are `stacked up´ below the 2007 ones. X* is a matrix of independent variables with K + 1 columns of explanatory variables `stacked´ up in the same fashion as Y. By convention we will assume the first column to be a vector of 1´s, which yields the standard intercept in a regression. D is a dummy variable that takes on the value of 1 if an observation belongs to the 2007 sample and zero otherwise. U is a column vector of disturbance terms associated with each observation

similarly `stacked up´. Greek letters indicate parameters to be estimated. Given our formulation of the dummy variable, the standard parameters (β) correspond to 1998 whereas the parameters associated with the dummy (δ) are the difference between any parameter in 2007 and 1998. That is, $\delta = \beta (2007) - \beta (1998)$.

In general the market determination of gasoline retail prices allowed by the law and the other changes associated with these nine years can have at least two consequences that affect the determinants of both of these relationships. They can affect the relationship by changing the values of the parameters, which suggest the relationship is not stable, or by changing the value of the conditioning variables, which can affect outcomes whether or not the relationship is stable. Our analysis emphasizes the stability of the relationships by identifying those aspects of the relationships for which the parameters don't change. When the parameters change, however, we note important changes in the means of the conditioning variables that can be suggestive of explanations.

For any subset of conditioning variables if the parameters are stable ($\delta = 0$), it suggests convincingly that the passage of the law and associated macroeconomic changes over the nine years had no effect on the inter-temporal stability of this aspect of the behavioral relationship.

Finally, we note that all of the results presented in the paper are based on robust standard errors that adjust for the clustering of observations by gas stations (14 clusters, 7 in 1998 and 7 in 2007). The rationale for the correction is to adjust for the fact that the assumption of identically and independently distributed disturbance terms for observations across clusters is unlikely to hold (e.g., Deaton 1997). Intuitively, common events that affect a particular cluster (gas station in a sample year in our case) can impact all respondents in that cluster in a similar manner affecting either the variance or the correlation of the disturbance terms within the cluster. For instance, the

common event may lead to responses that are not independent of each other but exhibit some correlation within the cluster.

PRELIMINARY RESULTS: INTER-TEMPORAL DIFFERENCES IN LEVELS

Before examining the impact of price liberalization on the inter-temporal stability of the two marketing relationships that are the focus of our analysis, we can establish two interesting facts on the basis of the descriptive statistics in our data presented in Table 1 of the Statistical Appendix. The first one is that price liberalization is associated with increased levels of customer satisfaction and future patronage intentions in a statistically significant manner. Whether this is due solely to the price liberalization is far more difficult to ascertain and we will not try to do so here. For instance, these same descriptive statistics point out a second interesting fact in this context. Namely, the number of competitors within 5 kilometers of each surviving station also increased in a statistically significant manner during these nine years. Thus it could be claimed that it was not the price liberalization per se but the increased competition associated with the entry and exit process that led to the increase in the levels of our two marketing variables of interest.

More generally these descriptive statistics suggest that surviving establishments have adjusted to both price liberalization and the consequences of entry and exit over this nine year period by emphasizing the services that appeal to a subset of their original customers and others with similar preferences while increasing prices. For instance, in 2007 the customers that patronize these surviving establishments perceive them as more accessible and informative as well as providing more assurance and better ambiance than in 1998. The nature of the customers also changed. These establishments are now patronized by more females and more patrons older than 25 as well as more married ones. In 2007 patrons make larger and more infrequent purchases

but visit the station more often while searching for alternative establishments less often than in 1998. In terms of statistically significant differences in objective characteristics, 2007 reveals surviving stations that display prices, have more aisles, charge higher prices and face more competitors than in 1998. This suggested explanation of the adjustment is consistent with the argument that increased competition leads to more players willing to differentiate themselves (Johnson, et al 2006).

MAIN RESULTS: INTER-TEMPORALLY STABLE RELATIONS

In this section we present the results of our analysis of the passage of the law and associated macroeconomic changes that affect market environments on customer satisfaction and future patronage intentions for surviving establishments. We estimated a variety of specifications of equation 3 for both customer satisfaction and future patronage intentions.

Table 1 contains the results (in abbreviated form) of estimating the most general specification for customer satisfaction. This specification included all five distribution services, all demographic variables and consumer characteristics and two objective variables at the same time.

INSERT TABLE 1 ABOUT HERE

The top half of the table presents the parameter estimates (and their t-ratios) for 1998 that were statistically significant at least at the .05 level for each of the three types of variables as well as any that would have a statistically significant change in 2007, regardless of their statistical significance in 1998. The second half of the table presents the corresponding estimates of changes in these parameters between 2007 and 1998. In order to prevent clutter we do not present

the purely demographic variables in Table 1 even if statistically significant. For, they were used as controls and have no particular interpretative value in the present context.

With respect to distribution services, the main result emerging from Table 1 is that prior to passage of the law consumer's perceptions of two distribution services, assurance of product delivery at the desired time and ambience, had a substantial positive effect on customer satisfaction in terms of both statistical significance and magnitude of impact, and this impact was not affected by the law or by the associated macroeconomic events of the following nine years. The hypothesis of inter-temporal stability in these two parameters cannot be rejected at levels of significance considerably higher than .05. Thus the passage of the law is unlikely to have had any effect on the impact of distributions services on customer satisfaction, regardless of whatever else was changing during this nine year period.

These results are not affected by the dropping of other type of variables from the regression at the same time. For instance, if we dropped all other consumer characteristics and their changes from the regression (including the demographic variables), the estimates for these two distribution services would be - .44 and –.27, respectively, they would both be statistically significant at well beyond the .05 level and their changes would be statistically insignificant with t-ratios well below 1. Not surprisingly, since the two objective variables included in the general regression (the level of competition, and the number of cars that can be handled simultaneously by a station) are statistically insignificant, dropping the objective variables from the regression has no effect on the other results.

With respect to consumer characteristics an interesting result emerging from Table 1 is that a perception of high prices had a negative impact on satisfaction before the passage of the law, but that this impact changed to a positive one afterwards. The most obvious interpretation is that the perception of store price level is not a stable determinant of customer satisfaction. Since

the law impacted prices of the main product offered by the establishment directly, however, we present other more nuanced interpretations below.

For instance, these gas stations sold items other than gas, for example car washes, simple repair services and some convenience store items. The prices of these other products were not fixed by the government in 1998. In this setting a change of impact from negative to positive is consistent with the view that gas prices played no role in perceived store price level before the passage of the law, since they were constant, but did so afterwards. Consumers' dissatisfaction with high prices before passage of the law referred to the prices of other products. After the passage of the law consumers may not have liked the higher prices overall, but had a wider choice of stations and chose the one they were sampled at because other dimensions predominated in the station choice. Thus, the positive effect on satisfaction in 2007 reflects the additional choices in terms of stations in 2007 and that the choice could now incorporate all margins, including gas prices. A more narrow interpretation is that the positive impact after the passage of the law simply reflects a reallocation of price sensitive consumers to low priced competitors.

One customer characteristic worth highlighting is frequency of purchases at the gas station. For, it plays the role of a control mechanism for possible selection effects since the consumers were sampled at the station. It has a positive impact on customer satisfaction that does not change after the price liberalization. This result continues to hold if we drop the objective variables from the analysis. It also continues to hold if we drop distribution services from the analysis. Furthermore we note that other results remain the same if we drop this variable from the specification. This indicates that selection is not an issue in our context of customer satisfaction with a transaction.

Putting these results in perspective we note that dropping the objective variables from the regression reported in Table 1 drops the R2 to .46. Dropping the consumer characteristics, including demographic variables, drops the R2 to .41. But, dropping distribution services reduces the R2 to .18. Table 1 in the Statistical Appendix shows that customer satisfaction with the seven gas stations surveyed in both years increased by .61 or 8.64%. This average increase was statistically significant at the 1% level. The change in the means of the two distribution services that are statistically significant accounts for 41% of this increase.

A tangential but interesting aspect of our results is that they provide empirical evidence for the literature on psychological implications of customer participation in co-production. Our empirical results indicate that pleasure in pumping gas has no effect on customer satisfaction before or after passage of the law. This evidence casts doubts on the suggestion (Van Raaij and Pruyn 1998) that the greater the sense of control the greater the satisfaction with the service. This same evidence supports an alternative hypothesis (Bendapudi and Leone 2003). Namely, when an outcome is as expected a customer who participates in production will be as satisfied with the firm as will a customer who does not participate in production. Since the activity of pumping gas is likely to result in an outcome as expected, our results support this hypothesis and its underlying explanation of self-serving bias in participation and its impact on satisfaction. This is more noticeable because there are no price differences between self-service and other stations in 1998 and the possible factor of a lower price for co-production is irrelevant in 1998.

With respect to the relation between future patronage intentions and its determinants, we should first address an econometric issue that arises due to the typical specification in the literature. If customer satisfaction is part of a system with future patronage intentions, which is implied by the literature that postulates links from attributes or services to satisfaction and then from satisfaction to performance as captured in equation (2), the error or disturbance terms in

both equations could be correlated. Since many of the same unobservable events between 1998 and 2007 would affect both customer satisfaction and future patronage intentions, this is a likely situation. Ignoring this correlation in the estimation of the relation between satisfaction and performance would in general yield biased estimates due to their being part of a simultaneous system (e.g., Wooldridge 2003).

A simple solution is to use the estimated values of customer satisfaction in implementing equation (2) rather than the observed ones. This is the procedure followed in estimating equation (3) for future patronage intentions. That is, we used estimated customer satisfaction from the previous section rather than actual customer satisfaction in all the regressions reported in Table 2. This table shows in abbreviated form the results from the most general specification estimated. Just as in Table 1 the top half represents parameter estimates for 1998 that were statistically significant at least at the .05 level for each of the three types of variables as well as any that would have a statistically significant change in 2007. Similarly, the bottom half presents the corresponding estimates of changes in these parameters between 1998 and 2007 and we do not include the purely demographic variables in the text tables regardless of statistical significance.

INSERT TABLE 2 ABOUT HERE

Substantively, a very important result to emerge from Table 2 is the inter-temporal stability of customer satisfaction as a determinant of future patronage intentions. Estimated customer satisfaction has a positive and statistically significant impact (p= .001). It is substantial in magnitude and its effect is the same in 1998 as in 2007. Thus, an important aspect of the relationship between customer satisfaction and future patronage intention stressed in the literature

is most unlikely to have been affected by the passage of the law and subsequent macroeconomic events.

With respect to customer characteristics, however, Table 2 reveals a different picture. Prior to passage of the law the inter-purchase time of gas decreases future patronage intentions while, not surprisingly, the frequency of purchases of gas at the station increases future patronage intentions. Both of these effects change in the subsequent nine years. While the impact of inter-purchase time of gas becomes positive, it is quite small in magnitude; in contrast, the impact of frequency of purchases of gas at the station decreases substantially but remains positive and sizable in magnitude.

Finally, the two objective variables included in the most general estimation were the level of competition faced by the station and whether or not self- service was offered by the station. While self–service was not statistically significant when included with the level of competition, it was when included by itself and, thus, we chose this one as the most general specification. While the level of competition did not matter before passage of the law, an increase in this level increases future patronage intentions after the liberalization. An intuitive explanation for this seemingly unusual result is that it is a consequence of a new equilibrium in the Pamplona market described in our preliminary results. Namely, surviving establishments have adjusted to the consequences of entry and exit over this nine year period by emphasizing the services that appeal to a subset of their original customers and others with similar preferences.

While the remaining results are not affected by eliminating estimated customer satisfaction or the objective variables from the regression, they are sensitive to dropping customer characteristics from the regression. More specifically, dropping these characteristics lowers the R2 in Table 2 to 21% and changes some individual results dramatically. For instance, the magnitudes of coefficients for estimated satisfaction and self-service almost double in size in

absolute value. One of the customer characteristics is frequency of purchases at the gas station. Since this variable captures factors that may have led to the selection of the gas station by consumers in the past, its elimination can lead to other variables artificially picking up its effect.

To further explore this issue, we re-estimated our most general specification dropping frequency of purchases at the gas station from the regression. The results are presented in Table 2 of the Statistical Appendix using the same format as Table 2 in the text. We find a similar dramatic doubling of the above two coefficients in terms of magnitudes. On the other hand, a number of other variables become statistically significant (at the $p < .05$ level) and others become statistically insignificant. For instance, the dummy for 2007 becomes statistically significant which suggests that it is picking up the effect of the omitted frequency of purchases at the gas station. Thus, including the frequency of purchases at the gas station is useful and necessary as a mechanism to control for sample selection. By contrast, in the case of customer satisfaction this variable had little if any impact on other results.

CONCLUDING REMARKS

We have established rather convincingly that the macroeconomic events affecting the market environment for gas stations in Pamplona, including passage of a law that affects the price of the main product sold by these retail establishments, had no effect on two of the distribution services or attributes determinants of customer satisfaction for surviving establishments, namely on assurance and ambiance. Thus, two of the main managerially relevant aspects of this marketing relationship are inter-temporally stable for surviving establishments.

With respect to customer characteristics, we found one inter-temporally stable result for customer satisfaction. The macroeconomic events of these nine years had no effect on the impact of frequency of purchases at the station (increasing) on customer satisfaction for these

establishments. On the other hand, these events are associated with a change in the direction of the impact of perceptions of prices relative to other establishments on customer satisfaction. Objective characteristics of gas stations had no impact on customer satisfaction before or after passage of the law.

Incidentally these results have implications for the literature on pricing strategies. A survey (Kopalle et al. 2009) identifies store/positioning format as one of seven factors impacting retailer pricing strategies in cross-channel competition. The results just discussed imply an equally important role in impacting retailers pricing strategies through in-channel competition. The main factors viewed as impacting strategy in terms of in-channel competition in the literature are pricing mechanisms such as loss leader strategy. Yet the same interaction between prices and distribution services observed for cross-channel competition, which has been suggested and tested for supermarkets (Lal and Rao 1997; Richards and Hamilton 2006), arises for in-channel competition in the case of gas stations.

In general, we find that the marketing relationship between future patronage intention and its determinants tends to exhibit less inter-temporal stability than the marketing relationship between customer satisfaction and its determinants. While the impact of customer satisfaction on future patronage intentions is inter-temporally stable to the passage of the law, both the inter-purchase time of gas and the frequency of purchases of gas at the station are inter-temporally unstable. Similarly, among the objective variables the level of competition is inter-temporally unstable.

Incidentally, the greater instability of results for future patronage intentions has implications for the retailing literature. Some authors have argued that there is a difference between behavior and intentions and that what matters in the context of retailing is behavior not intentions. While this argument has been made more forcefully in the context of moderating

effects rather than direct effects, (Seiders et al. 2005), our results suggest that it may also apply to direct effects.

Our research also has limitations that suggest potentially fruitful areas for further research. We have emphasized results that are stable with respect to macroeconomic events because they are the more convincing or reliable ones. But some of the ones that are unstable or change due to these events are quite interesting and worthy of exploration. What we have to say about them is more of a suggestive nature precisely because of the many things that are changing. In our setting this limitation is diminished in three ways: by having a physical product that is the same before and after the passage of the law that freed its price; by keeping location fixed in the study; and, finally, by observing the changes in the descriptive variables that affect the marketing relationships of interest both before and after the passage of the law. Nonetheless, a more direct approach to the changes identified here would be a worthwhile undertaking for future research.

Another limitation of the research is that it may be subject to what has been referred to in the psychological literature as common method bias (Podsakoff et al. 2003). A potentially important situation for this bias to arise is survey research where the respondent answers questions about both the dependent variables and the ones used to explained them, which is the case here. The fact that some distribution services, measured on the same basis as customer satisfaction, matter statistically and others have no effect suggests that this problem is not a serious one in our data. Similarly the fact that what matters for our two dependent variables, which are measured in the same manner, differs also suggests that this problem is not relevant in our context. The possibility of this source of bias in our context is also substantially diminished by the use of different survey sites, interviewers per site and years as well as by our use of clustering by survey site and year in all of our statistical analyses. Finally, there is also recent

research in the psychological literature showing that common method bias as a mechanism for inflating correlations has been substantially overstated (Spector 2006).

To conclude, we note that the understanding of the marketing relationship between future patronage intentions and its determinants seems less solid than between customer satisfaction and other performance variables, for example profits. Hence, a similar analysis of the effects of macroeconomic events that affect market environments on customer satisfaction and other performance variables would be a productive area for future research.

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Tables

Table 1

Customer Satisfaction

Parameters for 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
Constant	Constant	9.498	15.170
Assurance	[10–D_4]	-.399	-4.880
Ambiance	[10–D_5]	-.264	-4.080
Prices	X_6	-.137	-2.460
Frequency of purchases at the station	X_{13b}	.041	2.240
Changes between 2007 and 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
Prices	DX_6	.201	2.690
N	516	R^2	.4671

Table 2

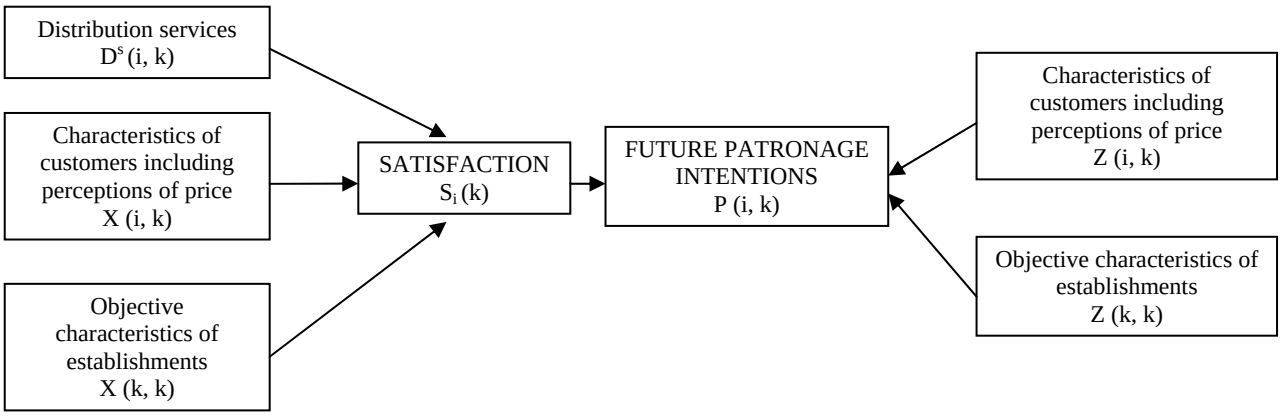
Future Patronage Intentions

Parameters for 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
Estimated customer satisfaction	S^	.514	4.050
Inter-purchase time of gas	X_{13A}	-.051	-3.60
Frequency of purchases at the station	X_{13B}	.512	12.360
Nº competitors 5 kms.	O_6	-.018	-.570
Changes between 2007 and 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
Inter-purchase time of gas	DX_{13A}	.068	2.190
Frequency of purchases at the station	DX_{13B}	-.334	-4.44
Nº competitors 5 kms.	DO_6	.090	2.480
N	516	R^2	.4436

Figures

Figure 1:

Conceptual Framework



Statistical Appendix

Table 1

Descriptive statistics

Variable name	*Symbol*	*Min*		*Max*		*Mean*		*S.D.*		*Diff M. (07-98)*	*Diff M. (t)**
		98	07	98	07	98	07	98	07		
Customer Satisfaction	S	1.00	.00	10.00	10.00	7.06	7.67	1.80	1.71	.61	3.94
Future Patronage Intentions	P	.00	.00	10.00	10.00	6.54	7.36	2.57	2.71	.82	3.51
Accessibility of Location	D_1	.00	1.00	10.00	10.00	6.66	7.82	2.30	1.96	1.16	6.13
Information	D_2	.00	.00	10.00	10.00	5.69	6.33	2.63	2.62	.64	2.79
Assortment	D_3	.00	.00	10.00	10.00	3.88	4.31	2.93	3.22	.43	1.58
Assurance	D_4	1.33	3.67	10.00	10.00	7.43	7.70	1.51	1.43	.27	2.10
Ambiance	D_5	.00	.00	10.00	10.00	7.23	7.73	1.92	1.68	.50	3.14
Perceived Price	X_6	.00	1.00	10.00	10.00	5.66	6.28	1.73	1.56	.63	4.32
Gender 0 (male)	X_{70}	.00	.00	1.00	1.00	.73	.58	.45	.49	-.14	-3.49
Gender (female)	X_{71}	.00	.00	1.00	1.00	.27	.42	.45	.49	.14	3.49
Age 0 (less than 25 years)	X_{80}	.00	.00	1.00	1.00	.33	.20	.47	.40	-.13	-3.29
Age 1(25 – 40 years)	X_{81}	.00	.00	1.00	1.00	.41	.46	.49	.50	.05	1.06
Age 2 (41 – 60 years)	X_{82}	.00	.00	1.00	1.00	.23	.28	.42	.45	.05	1.26
Age 3 (> than 60 years)	X_{83}	.00	.00	1.00	1.00	.03	.06	.18	.25	.03	1.72
Life cycle 0 (single)	X_{90}	.00	.00	1.00	1.00	.40	.24	.49	.43	-.16	-4.06
Life cycle 1 (no child)	X_{91}	.00	.00	1.00	1.00	.20	.34	.40	.47	.14	3.64
Life cycle 2 (child < 6 yrs.)	X_{92}	.00	.00	1.00	1.00	.13	.13	.34	.34	.00	.02
Life cycle 3(6 <child age <14)	X_{93}	.00	.00	1.00	1.00	.08	.14	.27	.34	.06	2.23
Life cycle 4 (child>14 yrs.)	X_{94}	.00	.00	1.00	1.00	.19	.15	.39	.36	-.04	-1.09

* Robust Student's T-test with unequal variances

Table 1

Descriptive statistics (continued)

Variable name	*Symbol*	*Min*		*Max*		*Mean*		*S.D.*		*Diff M. (07-98)*	*Diff M. (t)**
		98	07	98	07	98	07	98	07		
Hours worked	X_{10}	.00	.00	15.00	24.00	7.18	7.10	3.39	3.31	-.08	-.27
Mean length of stay (mins.)	X_{11}	1.00	1.50	30.00	15.00	5.48	5.44	3.01	2.65	-.04	-.15
Size of purchases (2007 euros)	X_{12}	2.79	4.00	63.66	72.00	24.87	33.85	10.19	13.36	8.99	8.62
Infrequency of purchases of gas (inter-purchase time)	X_{13a}	1.00	1.00	30.00	30.00	7.45	11.21	5.01	6.67	3.75	7.25
Frequency of purchases at the station (out of every ten times)	X_{13b}	.00	.00	10.00	10.00	5.47	6.67	2.99	2.77	1.20	4.73
Pleasure in pumping own gas	X_{14}	.00	.00	10.00	10.00	2.80	2.62	3.35	3.35	-.18	-.59
Importance of time	X_{15}	.00	.00	10.00	10.00	4.07	3.80	3.02	3.39	-.27	-.96
Searches for other stores	X_{16}	.00	.00	10.00	10.00	6.51	3.51	2.84	3.16	-3.00	-11.33
Self Service (Self service=1, Full service= 0)	O_1	.00	.00	1.00	1.00	.31	.27	.46	.44	-.04	-.97
Number of cars	O_2	6.00	6.00	22.00	22.00	9.74	9.29	5.39	4.91	-.44	-.97
Display of prices	O_3	.00	.00	.00	1.00	.00	.56	.00	.50	.56	18.41
Number of aisles	O_4	2.00	2.00	10.00	10.00	3.71	4.49	2.82	2.85	.77	3.09
Price (2007 euros)	O_5	.927	.920	.927	.972	.927	.939	.000	.016	.012	12.628
Nº competitors 5 kms.	O_6	3.00	3.00	12.00	18.00	9.09	13.47	2.97	4.88	4.38	12.40

* Robust Student's T-test with unequal variances

Table 2

Without frequency of purchases

Parameters for 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
Constant	Constant	-2.272	-1.920
Estimated customer satisfaction	S^	.938	6.530
Prices	X_6	.215	3.440
Pleasure in pumping gas	X_{14}	.094	2.730
Searches for other stores	X_{16}	.158	1.700
Inter-purchase time of gas	X_{13A}	-.070	-2.940
Self-service	O_1	-1.599	-3.060
Changes between 2007 and 1998			
	Variable	*Regression Coefficient*	*T-Ratio*
07Dummy	07Dummy	5.038	2.440
Searches for other stores	DX_{16}	-.405	-3.520
Inter-purchase time of gas	DX_{13A}	.090	2.610
N	516	R^2	.3161