SPATIAL RETAIL PRICING STRATEGIES FOR BEER IN GERMANY

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Abstract

The market for beer in Germany is special for many reasons, e.g. the purity law, the large number of breweries, or consumers who are highly loyal to local brands. To what extent brand loyalty affects spatial pricing strategies, is the main question of this article. We employ weekly retail scanner data for Germany from 2000 to 2001. We find that discounts are higher and offered more often the closer the brands are sold to the brewery they originate from. In addition, average prices are also lower on home markets. According to Anderson and Kumar (2007) this strategy is chosen because promotions generate new loyal customers who repay in periods of regular prices. Thus, loyalty of consumers may be endogenous. Alternatively, retailers use local beer brands as loss leaders, which can also explain the observed regional pricing strategies.

Keywords

Spatial Pricing, Regional Brands, Brand Loyalty, Beer, Germany

Zusammenfassung

Der deutsche Biermarkt weist mehrere Besonderheiten auf, beispielsweise seien die große Anzahl von Brauereien, die sehr loyalen deutschen Kunden und das Reinheitsgebote genannt. In welcher Weise Markentreue räumliche Preissetzungsstrategien beeinflusst, ist die zentrale Frage dieses Beitrages. Die Studie basiert auf Einzelhandelsscannerdaten, welche wöchentlich von 2000 bis 2001 gesammelt wurden. Wir können zeigen, dass die Marken stärker beworben werden, je näher der Verkaufsort an der Brauerei liegt. Auch die regulären Durchschnittspreise sind niedriger, wenn sich der Verkaufsort nahe bei der Brauerei befindet. Diese empirischen Ergebnisse bestätigen die Theorie von Anderson und Kumar (2007), wonach diese Preissetzungsstrategie gewählt wird, um neue, loyale Kunden zu generieren. Diese Strategie zahlt sich anschließend aus, wenn wieder Normalpreise verlangt werden. Eine Schlussfolgerung dieser Studie ist, dass es sich bei Markentreue um ein endogenes Konstrukt handelt: die Kunden werden erst durch den erstmaligen Erwerb, ausgelöst durch das Sonderangebot, treu. Alternativ kann auch die „Loss Leader“ Strategie die beobachtete Preissetzungsstrategie erklären.

Schlüsselbegriffe

Räumliche Preissetzung, Regionale Marken, Markentreue, Bier, Deutschland

1 Introduction

“Beer needs a home” (“Bier braucht Heimat”) is a famous saying from the middle age among German beer brewers. Regionalism one of the key trends in German retailing (ZÜHLSDORF and SPILLER, 2012). Among all products being produced locally, beer is the one the consumers associate the highest degree of regionalism with (DLG, 2011). Marketers use the regional origin of beer brands as a key element in their marketing strategies: Web-sites, TV commercials or newspaper ads use well-known and appreciated characteristics of the home region to create a unique and favorable image for the brand. For example, the brand Jever always shows some quiet spots from beaches at the German North Sea coast, the brand Flensburger uses typical Northern German landscapes and the specific human attitudes of people in the region. Bavarian beer brands as e.g. Erdinger or Paulaner often show traditional costumes of Bavarian people along with the beer garden culture in their marketing communications. Beer brands are part of the regional identity in the German culture: a consumer survey of 6,200 Germans carried out by El Cartel Media GmbH & Co. KG (2005) shows that every respondent knows the local beer brands. Moreover, 50 % of the respondents state that among the local beer brands is their favorite. This can be an advantage in the competition with other non-local brands. However, when brands are distributed nationwide this advantage on the home market turns to be a disadvantage on distant markets. To what extent German beer brands, therefore, employ spatially differentiated retail pricing strategies to account for regional consumer preferences is the main research question of the paper.

A theoretical foundation for the variation in retail pricing strategies according to differences in consumer preferences, namely in the levels of consumer loyalty, can be found in Jing and Wen (2008). They find that stronger brands promote less aggressively when the degree of brand loyalty is high. It is more profitable for the strong brand to exploit the loyal segment instead to attract price sensitive consumers.[1] Controversially, Anderson and Kumar (2007) show that stronger brands may offer higher and more frequent discounts because more frequent promotions and higher discounts lead to more loyal customers in future periods.

Preferences for beer consumption may not only vary over regions but also in time. Because of holidays, special events (e.g. soccer championships) or due to hot weather, beer consumption fluctuates seasonally. For instance, beer demand in Germany is up to 75 % higher during the summer (Private Brauereien Deutschland e.V, 2011). Contrary to standard economic thinking that retail prices rise during periods of peak demand, Chevalier et al. (2003) present theories that explain the fall of retail prices in periods of peak demand. The theories base on tacit collusion, loss-leader pricing strategies or lower search costs for consumers. For a variety of products - including beer - Chevalier et al. (2003) provide evidence of falling prices in periods of seasonal peak demand in the US. In our model we simultaneously analyze spatial and temporal dynamics of beer retail pricing in Germany for the top ten brands in the market such as Krombacher, König Pilsener, Becks, Jever etc. over a two year period.

Only a few studies have addressed issues of beer retail pricing. Recent examples are Rojas (2008), Rojas and Petersen (2008) and Slade (2004) who have investigated the role of market power on the US and UK beer market and the impact of advertisement on consumption; they do not find clear evidence for collusive behavior and conclude that the market behavior is competitive. For advertising Rojas and Petersen find predatory and cooperative effects; however, the letter effect is dominating. Culbertson and Bradford (1991) show in another study that beer prices vary substantially across US-States. Using prices of either Budweiser or Schlitz, two third of the price variations can be explained by other substitute product prices, demand-pressures, excise taxes, exclusive territories and transportation costs. To our knowledge, we add to the existing literature by analyzing spatial retail pricing strategies for the top ten beer brands in Germany at the level of individual retailers for the first time. The pricing strategies consist of three features, namely the regular price level, the frequency of promotions and the size of promotional discounts. For these features, we test brand specific and retail chain specific variations of the pricing strategies and we explicitly model the regional origin of brands (breweries) by employing robust OLS, Probit and Tobit procedures. We use weekly retail scanner data from the MaDaKom (Markt Daten Kommunikation) for the years 2000 and 2001.

We proceed as follows: First, we will describe the German beer market. Second, we develop the theoretical basis for spatially and temporally differentiated retail pricing strategies. Following, we describe the data and explain the model specification. Fourth, we present the estimation results for all characteristics of the retail pricing strategy. Finally, we summarize our findings and draw conclusions.

[1] KOÇAŞ, C. AND BOHLMANN, J.D. (2008) find a similar result.

2 The German beer market

COLEN and SWINNEN (2010) conclude that Germany, along with the US, UK, Czech Republic and Belgium, is a “beer drinking nation”. 53 % of total alcohol consumption in Germany comes from drinking beer. With an annual per capita consumption of about 100 liter, beer accounts for almost one seventh of the total per capita beverage consumption.
In a survey carried out in 2004 and 2005 EL CARTEL MEDIA (2005) investigated consumer preferences for beer in Germany. Results show that local brands have a strong position in the market. Every participant knows at least one local brand and for every other a local brand is the favorite beer. Also for 70 % of the respondents, the brand is more important for the product choice in beer than its price. Thus, German consumers are highly loyal towards their favorite brand, which very often is located close to home. We calculated market shares for each federal state for the top ten pilsener and wheat beers. In six states, the local brand places is the market leader in terms of market shares and only 4 brands do not place among the top 5 bestselling brands in their home state.
Consumers can purchase beer in a variety of outlets, for example in specialized beverage shops (SBS), gas stations or in the traditional food retail markets. Hard discounters (e.g. Aldi, Lidl, Norma), cooperate discounters (e.g. Plus, Netto), small and big supermarkets (e.g. Edeka), and small, regional and national hypermarkets (e.g. Famila, Plaza, Real) belong to the traditional food retail market in Germany. The traditional food retail market accounts for about 50 % of the distribution of beer (NAHRUNG-GENUSS-GASTSTÄTTEN, 2009). The most important group is specialized beverage shops (SBS) which holds 35 % the market off retail market.
The German market is more fragmented compared to the US or other international markets (SLADE, 2004; THE ECONOMIST, 2010). In 2000, the top 4 breweries in the US covered 95 % of the market, in Germany the top 4 make 30 % of the market (ADAM, 2006). 75 % of all European breweries are located in Germany (Table 1). Import volumes are also less significant for the German market compared to other European countries.

Table 1: Cross European comparison of beer industry

	Number of Breweries	Total beer production in 1000 hl.	Exports in % of total production	Imports in % of total production
Germany	1291	108.500	9,95	3,12
Great Britain	67	56.802	5,48	8,49
Spain	21	27.702	2,26	14,46
The Netherlands	16	25.232	51,90	3,11
France	20	18.866	12,41	25,48
Belgium	117	15.039	38,95	5,83
Italy	16	12.782	3,93	34,53
Ireland	6	8.712	40,40	7,40
Austria	59	8.588	4,83	5,33
Denmark	13	7.233	34,09	1,24

Source: Adapted from Kicker 2002

The German beer market has two unique regulations: the “Reinheitsgebot” and the “Bierzwangsrechte”. The German “Reinheitsgebot” (purity law) is the world’s oldest food law, underlining the industry’s status as a national symbol. The law laid down that the only malted barley, hops and water (and feast) enter the brewing process. As the majority of international brewers use further ingredients, their produce was banned on German market. In 1987, the

European Court lifted the trade ban; however, German brewers still oblige to the purity law and international competitor cover only a very small part of the market.
The Bierzwangsrechte are a set of laws limiting the sale of beer to a geographically defined region around the brewery (CARROLL ET AL., 1993). This law, being in place from the Middle Ages until the 19th century, might serve as an additional explanation for the loyalty towards local brands and high fragmentation of the German beer market. ADAM (2006) provides some more argument for the fragmentation the market; the "tied-house" system (see also DUMEZ AND JEUNEMAITRE, 1994; SLADE, 1998), a lower importance of profit maximization for some breweries and excise taxes.

3. Theory

If consumers are more loyal to their local beer brand and are less loyal to other brands imported from distant markets and if brands are distributed nationwide, then breweries might vary their spatial pricing strategies accordingly. Transportation costs separate regional markets. Brand loyalty implies that consumers accept a price differential before they switch from their preferred to another competing brand. Not all consumers in the market may be loyal to the local brand. Some may be non-loyal or switchers who buy the cheapest brand available. Therefore, the basic prerequisites for price discrimination are given. Brands can apply third degree price discrimination. This would result in higher prices for the local brand compared to non-local brands.[2] If local brands are exported to other regions, prices on distant markets are lower than on the home market. For the local brand breweries set a monopolistic price; prices for imported brands result from oligopolistic competitions. The price differences depend on the demand elasticity of consumers and the level of consumer loyalty for the local brand.
However, for the local brand is might also be rational to compete for switchers or non-loyal consumers. For example, the local brand can try to increase its market share by underbidding the non-local brands to gain all switchers' demand. While this might not be a profit maximizing strategy in all periods, a mixed strategy can still be rational. Several papers have analyzed the relationship between brand loyalty and promotional sales; however, the spatial aspect to our knowledge is not addressed in the literature yet. If we assume constant marginal costs of production for the brewers and restrictive transaction costs for consumers, the spatial problem can be solved separately for each individual market and we can use existing models to obtain the impact of brand loyalty on spatial retail pricing.
AGRAWAL (1996), ANDERSON and KUMAR (2007), JING and WEN (2008) and KOCAS and BOHLMANN (2008) present models under various settings to result the impact of brand loyalty on the retail pricing strategies of competitors. AGRAWAL (1996) models a retailer that sells a strong and a weak brand. Both brands have loyal customers, but the stronger brand's loyal customers are willing to accept a higher mark-up before switching to an alternative. The retailer faces two options: option one is to sell both brands at the consumers' reference price to the respective loyal segment. Option two is to offer either one of the brands on promotion to target the entire market in that period. Because the level of loyalty is higher for the stronger brand, effective discounts for the weaker brand need to be higher. As this option is costly for the retailer (loss by the price reduction in the loyal segment), it is used less often. Thus, local brands are promoted more often but at smaller discounts compared to other non-local brands.
JING and WEN (2008) use a different composition of consumer segments and introduce a non-loyal price-sensitive switching segment. They assume loyal consumers only for the stronger (local) brand and price sensitive consumers (switchers) else (non-local brands). Depending on the level of brand loyalty and the relative size of respective consumer segments, six different

[2] For a survey on (spatial) price discrimination see Neven and Phlips (1985), Holmes (1989), and Varian (1989) and Stole (2003).

outcomes are possible. With a relative increasing price sensitive consumer segment, brands offer deeper and more frequent promotions. Stronger brands will promote less (more) aggressively when the degree of brand loyalty is high (low) because it is more profitable to exploit the loyal segment instead to attract price sensitive consumers.

KOCAS and BOHLMANN (2008) introduce a third brand to the model. Weak and strong brands are defined in relative terms (switcher to loyal ratio). With a larger switching segement it becomes profitable to offer higher discounts. Thus, stronger brands (more loyal customers) promote less often and offers smaller discounts. Regular prices equal the consumers' reservation prices and are identical across brands by assumption.

A dynamic modeling approach is presented by ANDERSON and KUMAR (2007). Brand loyalty is assumed to be endogenous and affected by price promotions. If a brand is the cheapest in the first period, a fraction of switching consumers becomes loyal in the next period. The brands differ in their ability generate loyal customers from switchers. Strong brands have a higher ability. Both firms face the trade-off of either "harvesting" loyal clients by charging (high) regular prices or investing into future loyal clients by persuading switchers through significant discounts. As the stronger brand is more effective in creating loyalty, its incentive to invest into future customers is higher. Thus, the local brand would offer more frequent and higher discounts.

Table 2: Summary of spatial pricing predictions

A brand's pricing strategy on the home market (compared to distant markets):	Regular price	Promotional frequency	Mean promotional discount
AGRAWAL (1996)	Prices equal	More often	Smaller
ANDERSON and KUMAR (2007)	Lower	More often	Higher
JING and WEN (2008)	Prices equal	Less often	Same
KOCAS and BOHLMANN (2008)	Higher	Less often	Smaller

Source: Own presentation.

In a standard model of perfect competition, positive demand shifts lead to higher higher prices. CHEVALIER ET AL. (2003) discuss four different theories why the retailing business deviates from the standard model. First, consumers are more engaged in shopping during times of high demand (positive shifts). Thus, their demand elasticities become higher because they are more willing to search for low prices. Consequently, retailers are more inclined to lower prices and retail margins fall. Another reason might be that retailers have a higher incentive to deviate from tacit collusion during times of peak demand. Costs of leaving a tacit cartel are equivalent to the sum of lower margins in future periods of which currently higher market shares have to be subtracted. If there is a peak demand, revenues from deviating tacit collusion increase and consequently more retailers might lower their prices. Third, advertising is costly. Thus, retailers cannot advertise all their prices. According to the loss-leader strategy, retailers often promote items, which consumers buy frequently, and which they find of particular interest for their store choice. Finally, increasing returns to scale for retailers or manufacturers might be the reason for price reductions. Thus, for seasonal demand peaks we would expect more price promotions, higher discounts and lower regular prices compared to low demand periods.

4. Model specification and data

We define the brands' pricing policy by three dimensions, namely the regular price level, the promotional frequency and the average promotional discount. If we set two discrete levels for each characteristic (high, low), we obtain six potential strategies. We briefly discuss four strategies assuming that frequency of sales and the level of discounts positively correlate; if one is high, the other one is high as well. Following the list in figure 1, strategy one consists of frequent promotions with high discounts and high regular prices in non-sale periods. This strategy is useful to attract shoppers and/or to generate new loyal customers who repay the costs of promotions in periods of high regular prices. Following strategy two a firm offers only few price promotions, shallow discounts and sets low regular prices in non-sale periods. This strategy is close to the EDLP strategy and is used to attract shoppers and price sensitive variety seekers. The third strategy focuses on exploiting loyal customers by setting high regular prices and a reserved use of promotional activities. Finally, the fourth strategy is to promote aggressively and to set low regular prices in non-sale periods. This might be interesting for cost leaders or at least temporarily to enforce a higher market share or to drive competitors out of the market.

Figure 1: Pricing strategies

	Regular Price		**Frequency of Promotion**		**Level of Discount**	
	high	low	high	low	high	Low
Strategy 1	x		x		x	
Strategy 2		x		x		x
Strategy 3	x			x		x
Strategy 4		x	x		x	

Source: Own.

According to the theory, the composition of the consumer segment with regard to loyalty and the seasonal pattern of demand determine whether brands follow one of these strategies. In this paper we presume that the brands are strong on their home market implying a high share of loyal consumers. Even though the concept of brand loyalty can only be measured directly by consumer experiments or household scanner data, the market share of brands generally coincides with the level of brand loyalty (FADER and SCHMITTLEIN, 1993).
To test whether the location of markets and seasonal demand shifts affect the brands' pricing strategies on the German beer market, we separately estimate the following model specification for all three dimensions of pricing strategies (PS: frequency of price promotion, relative size of the discount or level of regular prices).

$$PS_{t,f,c,b,r} = \alpha + \beta Distance^{SP} + \mu Temperature + \sum_{i=1}^{7} \gamma_i D_i^{TH} + \sum_{i=1}^{2} \delta_i D_i^{FO} + \sum_{i=1}^{5} \varepsilon_i D_i^{CH} + \sum_{i=1}^{5} \vartheta_i D_i^{BR} + \varepsilon_{t,f,c,b,r}$$

Table 3 provides an overview of all variables entering the model. The dependent variables PS are the average share of sales, the average relative discount or the average regular price level for a particular brand (b) (out of the top ten pilsner and top ten wheat beers) over all stores of the same format (f) and retail chain (c) in the same Federal State (r) in the same week (t). To calculate the dependent variables, promotional and regular prices need to be identified. We follow HOSKEN and REIFFEN (2001) and define sales as significant temporary price reductions that are unrelated to cost changes. More specifically, a sale indicates a price cut by at least five percent with respect to the regular price. A sale does not last for more than four consecutive weeks. The regular or reference price is defined as the last non-sale price that persisted for at least four consecutive weeks. For generating time series of regular prices, sales' prices are replaced by preceding regular prices respectively.

Following the theoretical considerations, spatial consumer preferences affect spatial pricing strategies. Thus, the main variable is "distance", measuring the distance from the breweries to the federal state the retailers are located in.[3] The average daytime temperature for each federal state is captured in "temperature". To obtain dynamic adjustments in the pricing strategy, we include further dummies (D_i^{TH}). We account for nationwide school holidays, Father's Day, Easter and Pentecost. The Christmas dummy also captures the week before Christmas until New Year's Eve. A dummy "UEFA Euro 2000" captures the effects of the three weeks during the European soccer championship in 2000. Additional time-dependent dummy variables is "Oktoberfest", which equals one if the retailer is located in Bavaria and the Oktoberfest takes place. Retail chain (D_i^{CH}), retail format (D_i^{F}) and brand specific (D_i^{BR}) effects enter the model as well. For example, discounters may follow an EDLP-strategy with fewer promotional sales and lower regular prices.[4] Some retail chains may organize promotional activities nationwide while others pursue decentralized promotional strategies etc..

Table 3: Variable description

Variable	Description	Mean Value	Min	Max
Dependent Variables: PS				
Average Regular Price	Average of prices of the same brand within the same week, federal state, retail chain and retail format	0.2256	0.100	0.320
Promotional Frequency	Share of promoted prices of one brand within one week, federal state, retail chain and retail format	0.0296	0.000	1.000
Promotional Discount	Average %age-based price reduction among discounted prices of a brand within one week, federal state, retail chain and retail format	0.1111	0.050	0.475
Spatial Variable D_i^{SP}				
Distance	Distance between the retailers location approximated by state and the breweries location in 100 km.	3.3977	0.02	8.91
Temporal Variables D_i^{TH}, D_i^{CH}				
Temperature	Average weekly temperature during daytime for the state the retailer is located in.	10.3556	4.686	24.56
Father's Day	1 if the week preceding Father's Day, 0 otherwise	0.0195	0	1
Pentecost	1 if the week preceding Pentecost, 0 otherwise	0.0196	0	1
Easter	1 if the week preceding Easter, 0 otherwise	0,0193	0	1
Christmas	1 if the week preceding and following Christmas, 0 otherwise	0,0368	0	1
School Holidays	1 if for nation-wide school holidays, 0 otherwise	0.2488	0	1
Oktoberfest	1 during the Oktobergest in Bavaria	0,0050	0	1
UEFA Euro 2000	1 if beer was sold during the European Football Championship in 2000	0.0264	0	1
Retailer Dummies D_i^{FO}				
Discounter	1 if beer was sold in a discounter, 0 otherwise	0.0816	0	1
Supermarket	1 if beer was sold in a retailer < 800 sqm not being a discounter, 0 otherwise	0.3625	0	1
Hypermarket	1 if beer was sold in a retailer >800 sqm not being a discounter, 0 otherwise	0.5559	0	1
Chain dummies	1 if beer was sold in a retailer not affliated with a retail	0.0503	0	1

[3] The dataset only contains the federal state the retailer is located in, not the exact location.

[4] EDLP: every day low price. In contrast HILO: high low pricing.

	chain, 0 otherwise			
	1 if beer was sold in Edeka, 0 otherwise	0.2572	0	1
	1 if beer was sold in Markant, 0 otherwise	0.1518	0	1
	1 if beer was sold in Metro, 0 otherwise	0.2863	0	1
	1 if beer was sold in Rewe, 0 otherwise	0.0752	0	1
	1 if beer was sold in Tengelmann, 0 otherwise	0.1790	0	1
Brand Dummies D_i^{BR}				
Brand dummies	1 if beer was produced by Becks, 0 otherwise	0.3015	0	1
	1 if beer was produced by Bitburger, 0 otherwise	0.0663	0	1
	1 if beer was produced by Dinkel, 0 otherwise	0.0105	0	1
	1 if beer was produced by Erdinger, 0 otherwise	0.0841	0	1
	1 if beer was produced by Hasseröder, 0 otherwise	0.0382	0	1
	1 if beer was produced by Holsten, 0 otherwise	0.0846	0	1
	1 if beer was produced by Jever, 0 otherwise	0.0529	0	1
	1 if beer was produced by Krombacher, 0 otherwise	0.0645	0	1
	1 if beer was produced by Landskron, 0 otherwise	0.0032	0	1
	1 if beer was produced by Löwenbräu, 0 otherwise	0.0270	0	1
	1 if beer was produced by Maisel, 0 otherwise	0.0103	0	1
	1 if beer was produced by Oettinger, 0 otherwise	0.0231	0	1
	1 if beer was produced by Paulaner , 0 otherwise	0.1096	0	1
	1 if beer was produced by Radeberger, 0 otherwise	0.0614	0	1
	1 if beer was produced by Rothaus, 0 otherwise	0.0054	0	1
	1 if beer was produced by Scheider, 0 otherwise	0.0085	0	1
	1 if beer was produced by Schoefferhofer, 0 otherwise	0.0374	0	1
	1 if beer was produced by Spatenbräu, 0 otherwise	0.0426	0	1
	1 if beer was produced by Veltins, 0 otherwise	0.0469	0	1
	1 if beer was produced by Warsteiner, 0 otherwise	0.1223	0	1

Source: Own calculation based on Madakom 2002.

We employ weekly retail scanner data provided by MADAKOM GMBH (2002) covering a two-year period from 2000 to 2001. The panel consists of about 200 retail stores. We select the top ten ranked beer brands in the sample by calculating the overall average market share for the category pilsener and wheat beers. The top ten pilsener brands are Becks, Bitburger, Hasseröder, Holsten, Jever, Krombacher, Radeberger, Rothaus, Veltins and Warsteiner and the top ten wheat beers are Dinkel, Erdinger, Landskron, Löwenbräu, Maisel, Oettinger, Paulaner, Scheider Schoefferhofer und Spatenbräu. The data set includes all types of bottles and case sizes of which we use the most popular half-liter bottles. Table 4 contains descriptive statistics of the dependent variables for each brand. All stores belong to a retail chain, e.g. Metro, Edeka, Rewe, Markant and Tengelmann, and belong to a specific store format, e.g. discounters (DC), supermarkets (SM) and hypermarkets (HM). Average regular prices range from 0.124 to 0.258 DM per 100 ml. Sales frequencies range from 0 to 5.03 %. On average, every store puts beer on sale once a year. Average discounts range from 7.57 to 22.58 %. Rothaus is a notable exemption offering no price promotions. Rothaus is the only beer brand in the sample which is exclusively sold on its home market Baden-Württemberg.

Table 4: Descriptive statistics of the brands' pricing strategies

	N	Average Regular Price in DM/100 ml	Std. Dev.	Min	Max	Frequency of Sales	Level of Discount
Becks	12	0.221	0.017	0.158	0.280	1.87%	9.93%
Bitburger	83	0.229	0.020	0.190	0.300	2.38%	10.50%
Dinkel	13	0.209	0.017	0.196	0.260	1.21%	10.09%
Erdinger	10	0.246	0.025	0.184	0.318	4.83%	10.29%
Hasseröder	48	0.209	0.016	0.180	0.270	2.40%	9.63%
Holsten	10	0.197	0.012	0.158	0.250	2.01%	10.99%
Jever	67	0.196	0.008	0.154	0.258	1.09%	11.85%
Krombacher	81	0.234	0.020	0.196	0.298	3.77%	11.61%
Landskron	40	0.179	0.014	0.160	0.206	0.49%	44.74%
Löwenbräu	34	0.200	0.017	0.158	0.278	2.72%	9.88%
Maisel	13	0.252	0.016	0.226	0.290	8.12%	7.57%
Oettinger	29	0.124	0.017	0.100	0.198	2.08%	22.58%
Paulaner	13	0.245	0.017	0.190	0.298	4.74%	11.57%
Radeberger	77	0.230	0.019	0.190	0.298	5.03%	10.11%
Rothaus	68	0.229	0.003	0.220	0.236	0.00%	
Scheider	10	0.251	0.027	0.210	0.318	1.11%	10.59%
Schoefferhofer	47	0.220	0.019	0.198	0.278	0.68%	12.54%
Spatenbräu	53	0.242	0.022	0.198	0.298	1.67%	11.15%
Veltins	59	0.200	0.010	0.194	0.280	1.13%	10.49%
Warsteiner	15	0.258	0.033	0.180	0.320	3.25%	12.36%

Source: Own calculations based on MaDaKom 2002.

5. Results

We separately estimate the basic model specification shown in Equation 1 for all three dimensions of the pricing policy, namely for the average mean price, the share of promotional sales and the average level of discounts.[5] To consider brand and outlet format specific effects, we estimate a quasi-fixed effect panel model. Because of the properties of the endogenous variables, we apply different estimation techniques. The frequency of sales is bound between 0 and 1; thus, a Probit-quasi-fixed effect model is estimated. The share of promotional sales indicates a lower bound at zero. We, therefore, use a Tobit-quasi-fixed-effect model. The model for the average regular prices indicates heteroscedasticity, which we account for by calculating robust standard errors. The results for all models are presented in Table 5.

All specifications show high overall significance. Coefficients regarding **spatial effects** are displayed in the first row of Table 5. Overall, the coefficients for the distance variable are highly significant. The regular price increases and the promotional activity in terms of frequency and discount decreases the further away the beer is sold from its origin. Thus, beers are on average cheaper if they are sold close by their home markets. The coefficient of 0.0054 implies that the regular price for 100 ml beer increases by 0.0054 DM (2.4 %) every 100 km the beer is sold further away from the brewery. The magnitude of the regular price effect appears to be economically important; average regular prices of brands range from 0.124 to 0.258 DM per 100 ml. The estimated decrease in the regular price on distant markets of 0.0054 DM per 100 ml corresponds to a relative change of two to four percent. Considering that percentage return on sales in German retailing is below one percent, price differences of two or four percent can be very relevant to business success.

[5] Error terms of all three equations might indicate some interaction. Application of a SUR-estimation, however, is not necessary because the same exogenous variables enter the three equations.

Table 5: Estimation results for the brands' pricing characteristics

	Average Reg. Price (OLS-Robust)	Average Discout (Tobit)	Average Frequency (Probit)	Average Frequency dF/dx (Probit)
Spatial Effects: Base category are home markets				
Distance	0,0054***	-0,0055***	-0.0204 ***	-0,0012***
Temporal Effects: Base category are all weeks in which none of these events took place				
Temperature	-0,0002 ***	-0,0022***	0,0085***	0,0005***
Father's Day	-0,0027	0,0487***	0,1875***	0,0128***
Pentecost	-0,0024	-0,0384 **	0,1613***	0,0107**
Easter	-0,0042 *	0,0167	0,0582	0,0035
Christmas	0,0015	-0,0528***	0,2083***	0,0143***
School Holidays	0,0019 **	-0,0147**	-0,0533**	-0,0030**
UEFA Euro 2000	-0,0127 ***	0,0105	0,0166	0,0010
Oktoberfest	0,0168 ***	0,0097***	-0,0421	-0,0023
Retailer Effects: Base category are discounters and retailers without affiliation to a retail chain				
Supermarket	0,0815***	0,0881***	0,3089***	0,0193***
Hypermarket	0,0498***	0,0865***	0,3056***	0,0170***
Edeka	0,0103***	0,0298**	-0,1234**	-0,0066***
Markant	-0,0239***	0,0481***	-0,2084***	-0,0103***
Metro	-0,0557***	-0,0308*	0,1292***	0,0078**
Rewe	0,0038***	0,0861***	-0,3489***	-0,0149***
Tengelmann	-0,0039**	0,0367***	-0,1726***	-0,0088***
Brand Effects: Base category is Warsteiner				
Becks	-0.1847***	-0.0661***	-0.2474***	-0.0116***
Bitburger	-0.1348***	-0.036***	-0.1283***	-0.0065***
Dinkel	-0.2184***	-0.1321***	-0.5022***	-0.0178***
Erdinger	-0.0646***	0.0395***	0.1701***	0.0111***
Hasseröder	-0.224***	-0.0518***	-0.1896***	-0.0091***
Holsten	-0.3021***	-0.0574***	-0.2202***	-0.0105***
Jever	-0.3088***	-0.1141***	-0.4455***	-0.0173***
Krombacher	-0.1176***	0.002	0.0116	0.0007
Landskron	-0.3582***	-0.1857***	-0.8593***	-0.0221***
Löwenbräu	-0.2746***	-0.0415***	-0.1537***	-0.0076***
Maisel	-0.0367***	0.0983***	0.4314***	0.037***
Oettinger	-0.6521***	-0.0493***	-0.2575***	-0.0115***
Paulaner	-0.064***	0.0388***	0.1569***	0.0101***
Radeberger	-0.1373***	0.0527***	0.2246***	0.0155***
Rothaus	-0.1377***			
Scheider	-0.0287***	-0.1347***	-0.5114***	-0.0179***
Schöfferhofer	-0.1991***	-0.1497***	-0.5814***	-0.0199***
Spatenbräu	-0.0736***	-0.0763***	-0.294***	-0.0129***
Veltins	-0.2796***	-0.122***	-0.469***	-0.0177***
Constant	1,2287***	-0,5428***	-2,0817***	--
N	124805	125448	124763	124763
R²	0,6641	0.0753'	0.0481'	**(Pseudo-R² ')**

Legend: * p<0.05, ** p<0.01, *** p<0.001
Source: Own calculations based on MaDaKom 2002.

The average discount level in the sample is about 11 percent and the average frequency is about 2.9 %. The estimators for the distant market dummies suggest that almost no sales are offered on distant markets and that discount levels on these markets are cut by half in comparison with the home market. These results clearly support the theory by ANDERSON and KUMAR (2007) who theoretically derive that the stronger brand promote more aggressively uses price promotions to generate new loyal customers. As brands are strong on their home market, price promotions are more frequently used. Regular prices are higher on the home market; thus, consumers pay even more in non-sale periods.

Temporal effects on pricing strategies are captured by the temperature variable and dummies for national holidays during (Easter, Ascension Day, Christmas and Pentecost) and dummies for special events (UEFA Euro 2000, Oktoberfest). The theory discussed by CHEVALIER ET AL. (2003) says that prices fall during peak demand. The “price” employed in CHEVALIER ET AL. (2003) is a wheighted price of all brands, averaging over sales and regular prices. In our estimation, those prices are analyzed apart from each other to disentangle the substitution effects discussed in NEVO (2006). The variables only indicating a particular event lasting for one week rather affect promotional strategies. For example, variables as Father’s Day or Pentecost, which last for only one week, do not significantly affect the average regular price but do alter promotional frequency and discount. During Father’s Day, the promotional discount is on average 0.05 % higher than during weeks without special holidays or events. In addition, the likelihood of a promotion to occur during Father’s Day is significantly higher compared to normal weeks. Accordingly, events lasting for more than one week as e.g. the soccer championship rather influence regular prices than the promotional strategy.

The majority of coefficients take the expected signs, regular prices decrease and promotional activity increases during times of peak demand. Only school holidays do not follow that pattern, regular prices increase and promotional activity slows down. One reason might be that school holidays are not closely connected to beer consumption.

One of the most pronounced effects on promotional discounts can be documented in the week before Father’s Day- average discounts are 5.6 % higher. As the average discount equals 11 %, this is 50 % higher than in other weeks. In Germany, Father’s Days is also called “Men’s Days” on which men traditionally have a men’s night out or go hiking accompanied by a handcart full of beer. Thus, in addition to providing an opportunity to invite family and friends over for barbecuing, Father’s Day is particularly connected to beer consumption. On the contrary, during the European football championship, promotional measures were unaffected but regular prices were significantly lower.

With regard to the **retailer effects**, the coefficients show the expected signs. Compared to discounters, the coefficients for supermarkets and hypermarkets confirm higher regular prices of about 20 to 35 %, much higher price discounts and more frequent price promotions, which is due to their HiLo-strategy. There is also evidence for chain specific pricing effects.

Brands effects on pricing strategies can also be documented. For example, Warsteiner, the base category, shows the highest regular price level. On the contrary, Oettinger is the cheapest brand on the market. Oettinger wants to be the overall price leader, offering less promotions but constantly low prices- comparable to an EDLP strategy of a retailer. Maisel is the brand that is offered on sale most often with significant reductions. As a Bavarian brewery, they are very active in regional sponsoring and also offer premium quality, as e.g. organic wheat beers. We tested whether instead of brand dummies a dummy for the category can be introduced to the model (pilsner/ wheat beer), but the restricted version is inferior to the full model.

6. Conclusions

German consumers are highly loyal towards local beer brands and are less loyal towards competing brands originating from other regions. To what extent these differences in consumer loyalty affect retail pricing strategies of the main brands in the German beer market is the main research question of this paper. We use weekly retail scanner data for the period from 2000 to 2001 for the top ten beer brands in Germany to analyze spatial and temporal retail pricing strategies. We classify pricing strategies by three main characteristics, namely the average regular price, the frequency of price promotions and the level of promotional discounts. For these variables, we estimate spatial and temporal dynamics.
At first glance, we might expect that strong local brands use promotional discounts less frequently, offer lower discounts and charge higher regular prices. In periods of peak demands, we might see higher prices and less promotional activities. However, ANDERSON and KUMAR (2007) and CHEVALIER ET AL. (2003) show the contrary. For strong brands and/or in periods of peak demand excessive use of promotional measures may be rational. Strong brands might indicate a higher potential to generate new loyal consumers. To make full use of this potential firms place promotions. In periods of peak demand consumers show more elastic behavior, which also calls for a more excessive use of price promotions.
Our results support these theories. Local beer brands can rely on more and higher brand loyal consumers. The spatial pricing strategy, thus, is to promote more aggressively close by the home market and less on more distant markets. On distant markets, we find very few shallow promotions, and higher regular prices. For non-local brands it is too costly to divert consumers that are loyal to local brands; their potential to generate new loyal customers is small. These pricing policies are mainly driven by the breweries. If the retailer is the main actor in setting prices, loss-leadership could serve as an alternative explanation for the results found. Beer is a fast moving consumer good and consumers are highly involved and well informed when buying beer. This would make beer an ideal candidate to act as a loss leader to attract customers to the store. Retailers use the strong (local) beer brand to attract a large number of customers. Similarly, the theory by CHEVALIER ET AL. (2003) in based on the retailers response to more and better informed customer in periods of peak demand.
A managerial implication of these results may be that at least on the German beer market expanding breweries are better off taking over competing (local) brands to conquer distant markets instead of heavily discounting their product nationwide (on the distant markets). For past takeovers on the German beer market, we always find that new owners keep the taken over (local) brand's marketing concept almost as it was before. Thus, brewers leave the market by takeover, but their (local) brands' and marketing concepts do not die with it.

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