

## Modelling Brewing Industry Pricing

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### Anotace

Cílem příspěvku je analyzovat cenové chování druhé až jedenácté nejsilnější pivovarnické společnosti na českém trhu na základě cenového chování cenového vůdce, kterým je Plzeňský Prazdroj (member of SABMiller). Při použití měsíčních cen (počet pozorování je zpravidla 108 období) je modelována délka zpoždění při změně ceny cenového vůdce a ostatních společností. K modelování je použita lineární regresní analýza. Jednotlivé značky piv jsou rozděleny do 3 segmentů: superpremium, mainstream a nealkoholická piva a cena je modelována zvlášť pro sudové a pro lahvové balení, pokud to disponibilita dat umožňuje. Výsledky chování jednotlivých společností jsou na závěr zobrazeny do syntézy.

### Klíčová slova

Beer, brand, Plzeňský Prazdroj, cenový vůdce, cenová politika, oligopol.

### Abstract

The aim of this contribution is to analyse the price behaviour of the second to eleventh strongest brewers on the Czech market on the basis of the price behaviour of the price leader, this being Plzeňský Prazdroj (a member of SABMiller). Using monthly prices (the number of observations is generally 108 periods), is modelled the length of delay between the price leader and the other breweries making a price change. A linear regressive analysis is used to produce the model. The beer brands are divided into 3 segments: super-premium, mainstream and non-alcoholic beer and prices are modelled separately for barrelled and bottled beer if the data is available to allow it. The results of each brewery's behaviour are summarised in conclusion. The information presented in the article is the product of working on the Research Plan MSM 6046070906, "The Economics of Czech agriculture resources and their efficient use within a multifunctional agri-food systems framework".

### Key words

Beer, Brand, Plzeňský Prazdroj, price leader, pricing policy, oligopoly.

### Introduction

In this paper the analysis of the pricing policy of ten Czech brewery companies on the basis of Plzeňský Prazdroj price leadership is carried out.

The make-up of the vertical production chain for beer is no different to that for other food industry vertical production chains. With a little simplification, it can be divided into a total of four levels:

1. Primary consumer demand, which can be viewed from two angles (demand and supply oriented approaches)
2. Demand from stores, specifically retail and wholesale stores and caterers; this demand

arises directly from primary consumer demand.

3. Demand from higher level processors, i.e. brewery demand for ingredients, these being mainly malt and hop products. This demand arises directly from demand (B) and indirectly from total primary demand.
4. Demand from lower-level processors, i.e. the demand of malthouses for barley supplied by farmers (or mediated by marketing organisations), where relevant the demand of hop extract producers for their basic ingredients. This demand arises indirectly from consumer demand either via demand from consumers or demand from stores and directly via demand from higher level processors.

The following relationships between each basic link can be characterised according to competition type in the Czech Republic in the following way:

1. There is a state approaching perfect competition between store level subjects on the supply side, although this may have certain elements of monopolistic competition<sup>1</sup>.
2. There is monopsonic competition between store level subjects on the demand side, which may in some cases have elements of oligopoly, particularly for large chainstores which are partially able to affect product price.
3. There is an oligopoly among higher level processors on the supply side, with Plzeňský Prazdroj, a.s. (a member of SABMiller) the price leader.
4. There is monopolistic competition between higher level processors on the demand side, with Plzeňský Prazdroj (SABMiller) again displaying different behaviour, acting in the role of oligopolist<sup>2</sup>.

<sup>1</sup> The buying up of restaurants by economically strong breweries can cause a certain amount of deformation. This happens when a specific brewery becomes the exclusive beer supplier for a certain period on paying a certain amount of financial compensation. Large brewers tend to follow this practice.

<sup>2</sup> They can most exploit the advantages of a global company, due to their being the largest company on the market in the Central Europe region. They are in control of around 50% of the Czech beer market, roughly 40% in Slovakia and also have significant shares in Poland and Hungary. It purchases its ingredients centrally and thus has a strong bargaining position.

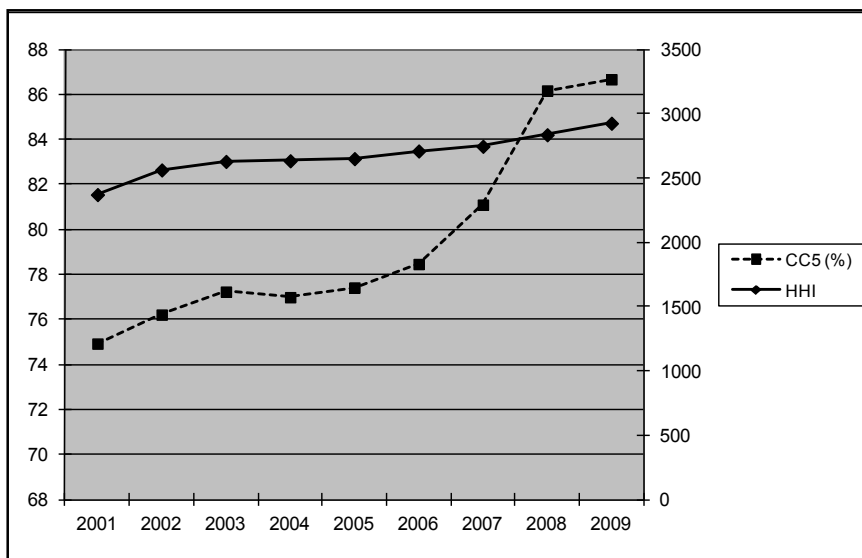
5. There is roughly monopolistic competition between lower level processors on the demand side.
6. There appears to be perfect competition between primary producers on the supply side.

Nevertheless, in terms of the strength and quality of relationships between each level of the production chain, the beer production sector is exceptional in that the brewing industry is one of the most concentrated industries with a major price leader within the food sector. Graph 1 shows the development of concentration on the Czech beer market using the Herfindahl-Hirshman index (HHI) and the concentration coefficient for the five largest companies in the sector (CC5).

For the Herfindahl-Hirshman index, an index of 1 800 can be considered a critical value, above which the market is concentrated. In the second half of 2009, this value was 2 938.72.

From this standpoint, the Czech market, rather than the neighbouring German market, is much closer to the American market, where the Herfindahl-Hirshman index was 2 932.66 in 2005, actually representing a fall from 2000 (of 620.5 points)<sup>3</sup>. One striking feature in the U.S. brewing industry is that the number of independent mass beer producers decreased dramatically from 421 in 1947 to 24 in 2000 [Yao (2012)].

<sup>3</sup> Calculated on the basis of B. Yenne's book, The History of Beer in America, see References



Source: own calculation on the basis of data form RIBM\* and Canadian, Market Insight 2010

Graph 1: Development of concentration on the Czech beer market\*\*.

\* Research Institute of Brewing and Malting in Czech Republic

\*\* Because the values of these two indices are orders of magnitude different, for HHI the decimal point was moved two places left.

Analyzing market structure and market behavior is essential to investigate the impact of companies on (consumer and producer) welfare. Market structure refers to the type of market in which firms operate. Breweries do not operate in perfectly competitive markets, because the number of competing firms is too small (especially if you focus on the lager market). A simplistic measure to estimate potential market power is the concentration ratio. For example the C3 (= the turnover of the largest three enterprises as a % of the turnover of the sector) of the Belgian beer market was 0.84 in 2000, indicating an oligopolistic market. A similar oligopolistic market structure can be found in the majority of countries worldwide [(Benson-Armor et al., 1999), Wauters E., Van Passel S. (2007)].

Oligopolistic markets can be related to a process of creative destruction, where oligopolists face strong competition from existing rivals and cannot afford the more relaxed life of the monopolist. But at the same time, oligopolists can keep a good share of the profits that they earn from their innovative activity. The public challenge is to keep oligopolistic companies competing rather than colluding [Schumpeter (2008)].

In comparison with other alcoholic drinks, price elasticity is the lowest for beer. Leung and Phelps come to the conclusion that price elasticity approximately equals -0.3 % for beer, -1.0 % for wine and -1.58 % for spirits. [Leung and Phelps (1999)]. Clements, Yang and Zheng's study comes to the conclusion that price elasticity is -0.35 % for beer, -0.68 % for wine and -0.98 % for spirits. Although the conclusions of both studies differ, it is still clear that in contrast to other alcoholic drinks producers, breweries need not be so cautious in their pricing policies [Clements, Yang and Zheng (1997)].

The studies did not deal with levels of elasticity for the reaction of brands between themselves, with the only exception being Langan: 'price reaction results suggest most brands within a given segment follow pricing of other brands rather than not reacting or engaging in price rivalry.' [Langan (1997)].

## Material and methods

Modelling the pricing policies of individual selected products of the second to eleventh largest companies can in general form be systematically described by the economic relationship:

$$price\ pB_t = f(price\ pPPB_{(t-1, t-2, \dots, t-18)}, ZO), \quad (1)$$

where

- p is packing (barrel – ba or bottle – bo),
- B is name of brand,
- PP is brand produced by Plzeňský Prazdroj,
- ZO is a zero-one vector (changing of excise duty).

For the exogenous variable (beer price from Plzeňský Prazdroj's production) delays of length 1 to 18 periods were considered (with monthly periodicity), any longer delay can no longer be considered relevant. The criterion for selecting the most appropriate function (specific delay) is the maximum of intensity of dependence. The significance level is 0.01.

Simplifying the product categories was somewhat objective, and resulted in separation into the following segments:

1. Super-premium products, in which the products Budvar12, Stella Artois and bottled Bernard with a resealable cap (boBernardRC) are included from the second to eleventh largest companies. The prices of these products were modelled on the basis of the price development for the super-premium Pilsner Urquell brand (produced by Plzeňský Prazdroj).
2. Non-alcoholic beer from the second to eleventh largest companies, whose prices were modelled on the basis of price development for Radegast Birell (produced by Plzeňský Prazdroj).
3. Mainstream products from the second to eleventh largest companies, whose prices were modelled on the basis of the price development of the Gambrinus brand (produced by Plzeňský Prazdroj). During the period monitored, the Gambrinus brand held on to a share of around 25% of the Czech market. There was also a split in this category to so-called ten-degree beer<sup>4</sup> and eleven-degree<sup>5</sup> beer, whose price development was modelled on the basis of the price of the product Gambrinus světlý (produced with a little under 10 degrees of Plato) and so-called twelve-degree beer<sup>6</sup>, whose development was

<sup>4</sup> In subsequent text, the number is placed after the brand name, for example Černá Hora brand ten-degree beer is referred to as Černá Hora 10.

<sup>5</sup> In subsequent text, the number is placed after the brand name, for example Černá Hora brand eleven-degree beer is referred to as Černa Hora 11.

<sup>6</sup> In subsequent text, the number is placed after the brand name, for example Černá Hora brand twelve-degree beer is referred to as Černa Hora 12.

modelled on the basis of the price development of Gambrinus premium (produced with a little under 12 degree of Plato)<sup>7</sup>.

A dummy variable had to be included in the partial models in the form of a zero-unit vector, because from the beginning of 2010 there was an increase in excise duty which resulted in a price increase for beer from all companies which was in no way caused by Plzeňský Prazdroj's pricing policy. Naturally, this variable was not included in models analysing the price of non-alcoholic beers. In this connection, the conclusions of Manning, Blumberg and Molton's study can be noted, that very heavy drinkers were found to be less responsive to changes in price than any other drinking group. The implication of this finding is that while higher alcohol taxes may reduce consumption by light and moderate drinkers, it will have little impact on very heavy drinkers, many of whom impose considerable external costs on society. In a more recent study [Manning, Blumberg and Molton (1995), Freeman (2000)], after controlling for income, found that alcohol taxes only modestly impacted the consumption of beer, with short-run and long-run elasticities around 0.01 and 0.1.

For the same tax revenue, consumer welfare can be reduced or, for the same level of loss to consumer welfare, taxation revenue can be increased. Both these scenarios result in a reduction of pure alcohol consumption [Byrnes et al. (2012)].

For beer the minimum tax rate has been unchanged since 1993, and it is equal to 0.7448 Euros per hl/degree Plato or 1.87 EUR per hl/degree of alcohol of finished product [Lockwood, Migali, 2008].

The theoretical modelling is based on the following suppositions:

1. Super-premium products, in which the products Budvar<sup>12</sup>, Stella Artois and bottled Bernard with a resealable cap (boBernardRC) are included from the second to eleventh largest companies. The prices of these products were modelled on the basis of the price development for the super-premium Pilsner Urquell brand (produced by Plzeňský Prazdroj).
2. The other breweries attempt to increase their products' prices as soon as possible after the price leader increases its prices, but there is a

certain delay before their prices are changed (see method).

3. The breweries maximise their economic profit and behave rationally.
4. Imports have no impact on Czech breweries' pricing policies.

Beer imports to the Czech Republic over the monitored period were lowest in 2002 (1.03 % of domestic consumption), however particularly due to the crisis of the past two years, this value had risen to 4.16 % by 2009. Nevertheless, not even this value can be considered significant enough to have a major impact on the pricing policies of domestic breweries, especially considering that there are a large number of importers who do not co-operate together. In addition, this imported beer is mainly in the economy segment, which is not a subject of this article's analysis. Nevertheless, some studies (e.g. Rojas, 2006) do model price development for imported beer<sup>8</sup>.

The official wholesale pricelists for each brewer were used as base data<sup>9</sup>. The data was used most commonly with monthly periodicity in the period April 2001 to October 2010 (i.e. a total of 108 periods), and only in exceptional cases did the time period have to be shortened because of some older data being unavailable from a few brewers. Nevertheless, care was always taken to ensure there was a sufficiently large number of degrees of freedom.

Some complication was caused during modelling by changes in the effective number of companies whose prices were being modelled, which was a result of concentration on the market over the period concerned due to mergers and acquisitions; at the beginning of the modelling period, Heineken only owned Starobrno, but subsequently the companies Drinks Union and Královský pivovar Krušovice were added to its portfolio. However, we can get around this situation by primarily modelling the price of separate brands or products.

The program *Gretl* was used for estimations and the relationships between variables are considered to be linear. The input data was tested by the

<sup>7</sup> Czech law doesn't recognise the terms 'ten-degree beer', 'eleven-degree beer' or 'twelve-degree beer'. This classification is an historic one and consumers as well as breweries use it more often than the official classification of light beer having 8 – 10.99 degrees Plato and lager having 11 – 12.99 degrees Plato.

<sup>8</sup> It is worthy of note that Plzeňský Prazdroj in particular has a totally different pricing policy abroad, which means it can occur that its products can be imported back in bulk from Germany or Poland to the Czech Republic.

<sup>9</sup> Except for Plzeňský Prazdroj, the brewers' wholesale pricelists were officially provided, although it was the case that smaller companies were more willing to provide them. Plzeňský Prazdroj resolutely refused to provide this information, and so this data was acquired by an unofficial way.

Doornik-Hansen test, the Shapiro-Wilk W test, the Lilliefors test and the Jarque-Bery test. The highest p-value achieved an exceptional significance level of 0.03 using the Jarque-Bery test (in other cases it was always significantly less than 0.01), so the input values were negatively tested for normal distribution.

## Results and discussion

### Pivovary Staropramen

Pivovary Staropramen (a member of StarBev) maintained a stable and steadfast second place over the whole of the modelled period with a market share of between 13.5 % and 16 %. The results for the modelled barrelled beer are unequivocal,

Company/product	delay	R2	Validity*)	Elasticity	Company/product	delay	R2	Validity*)	Elasticity
Pivovary Staropramen					Svijany				
baStaropramen10	1	0.94	yes	0.82	baSvijany10	2	0.94	yes	1.39
baStaropramen12	1	0.91	no	0.90	baSvijany11	2	0.94	yes	1.24
baStella	1	0.93	no	0.88	baSvijany12	2	0.92	no	1.39
boStaropramen10	13	0.76	no	0.83	boSvijany10	6	0.82	yes	2.16
boStaropramen12	11	0.33	no	0.31	boSvijany11	6	0.83	yes	1.78
boStella	7	0.79	no	1.17	boSvijany12	14	0.81	yes	1.83
nStaropramen	2	0.82	-	1.34					
					Platan				
Starobrno/Heineken					baPlatan10	1	0.94	no	1.19
baStarobrno10	2	0.96	no	1.00	baPlatan12	1	0.85	no	1.10
baStarobrno12	2	0.93	no	1.06	boPlatan11	12	0.69	yes	1.13
boStarobrno12	1	0.70	yes	0.45	Nplatan	12	0.70	-	0.43
nStarobrno	1	0.63	-	0.42					
					Černá Hora				
Krušovice/Heineken					baCernahora10	4	0.94	yes	0.62
baKrusovice10	1	0.94	no	1.07	baCernahora11	4	0.91	yes	0.58
baKrusovice11	1	0.83	no	0.71	baCernahora12	4	0.92	yes	0.64
baKrusovice12	2	0.93	no	1.09	boCernahora10	4	0.84	yes	0.66
boKrusovice11	12	0.37	yes	-1.08	boCernahora11	4	0.92	yes	1.16
Clausthaler	3	0.51	-	0.25	boCernahora12	3	0.84	yes	0.53
					NCernahora	2	0.45	-	0.44
DU/Heineken									
baZlatopramen11	1	0.95	yes	1.10	Bernard				
baBreznak12	1	0.91	yes	1.07	baBernard10	1	0.98	no	1.12
					baBernard11	5	0.79	no	0.42
Budějovický Budvar					baBernard12	2	0.97	yes	1.35
baBudvar10	9	0.92	yes	0.78	boBernard11	9	0.76	no	3.16
baBudvar12	2	0.91	no	0.74	NBernard	13	0.63	-	0.95
boBudvar10	17	0.52	no	1.28	boBernardRC	13	0.83	no	1.77
boBudvar12	2	0.82	no	1.21					
NBudvar	1	0.82	-	1.35					
PMS Přerov									
baZubr10	4	0.95	yes	0.79					
baZubr12	11	0.93	no	0.96					
boZubr10	2	0.80	yes	1.13					

\*) Statistical validity of excise duty influence

Source: Own calculations on the basis of brewery pricelists

Table 1: Results of the estimations.

with the price increase reaction being the shortest possible, a delay of one period even for the non-domestic super-premium brand Stella Artois, which has however been produced since November 2004 under licence in the Czech Republic. In the mainstream brand bottled category, the reaction is 13 periods for the Staropramen 10 product and 11 periods for the Staropramen 12 product. The reason for this will undoubtedly be the pressure of chainstores for a slow increase in prices. The price reaction for Staropramen 12 also demonstrates a very low elasticity (0.31 %), because the strength of this product is very small. In contrast, Stella Artois showed a delay of 7 periods and elasticity of 1.17 % because the importance of this brand continues to rise and the company can allow the price to increase at a higher rate than the price growth is for the Pilsner Urquell brand. Non-alcoholic beers display a very short reaction period (2 months); the non-alcoholic beer market in the Czech Republic is very progressive and it is one of the few segments which are growing. With the exception of barrelled Staropramen 10, the impact of the excise duty rise was shown to be statistically insignificant. This may confirm the conclusion of Freeman's study (2000).

### Heineken

Heineken is the youngest multinational company on the Czech beer market and over the monitored period increased its share from 4.66 % in 2003 when the company entered the Czech market and took over Starobrno to 12 % in 2009. This growth was as a result of acquiring the companies Královský Pivovar Krušovice and Drinks Union.

### Starobrno

The mainstream Starobrno brand is more of a regional brand spread over the South Moravia region, where it has a very good position, meaning that it will have a regional market share much higher than the roughly 4% it has nationally. For barrelled beers, reaction is delayed by 2 months and elasticity is roughly proportional – at 1.00 % for the Starobrno 10 product and 1.06 % for the Starobrno 12 product. Here too, the increase in excise duty had a statistically insignificant effect. A similar sales policy is demonstrated by the Starobrno 12 bottled and non-alcoholic beer products. Delay in growth of the price level according to the model used is one period, although they demonstrate significant inelasticity, with elasticity values of 0.45 and 0.42. Here again, the strength of the chainstores and significantly higher competition in off-trade make themselves clear.

### Drinks Union

In 2008, Drinks Union was bought by Heineken and it has two major brands in its portfolio – Zlatopramen 11 and Březňák 12. Partial models were estimated only for barrelled products, as bottled products had a low number of degrees of freedom, meaning an unequivocal conclusion could not be made in this case. The Zlatopramen 11 and Březňák 12 products display like results, the price level rising with a one-month delay and elasticity also proportional for both. In contrast to most of the previous beers, the impact of the increase in excise duty was statistically significant.

### Královský pivovar Krušovice

Královský pivovar Krušovice was one of the few analysed companies to significantly lose market share on the Czech market over the modelled period from around 4 % in 2001 to 2.5 % in 2007, when it was bought by Heineken. Nevertheless, despite this negative trend, its pricing policy closely adhered to the market leader pricing policy in terms of barrelled beer. The Krušovice 10 and Krušovice 11 (trade name Mušketýr) products' prices rose with a delay of one period, and Krušovice 12 had a two month delay. No impact of the excise duty increase was seen. A result which is contrary to the suppositions is the pricing policy for bottled Krušovice 11, which showed negative elasticity. However, a detailed study of the base data makes clear that the pricing policy in this case was particularly inconsistent and sporadic, with alternating increases and decreases in price. In addition, the correlation is only 0.37 in this case.

The price of the non-alcoholic beer Clausthaler, the only one to be produced abroad, displays a delay of one period and very low elasticity (0.25 %). The significance of this product on the Czech market is negligent.

### Budějovický Budvar

Budějovický Budvar maintained a market share of between 3.6 % and 5.78 % over the monitored period and almost half of its production is exported. The price behaviour of the super-premium Budvar 12 brand is very similar for both barrelled and bottled beer, with a delay of only two months. The high elasticity for bottled beer (1.21 %) is surprising and signifies that the prices of this product and bottled Pilsner Urquell are converging. The situation is completely different for the Budvar 10 product, which is mainstream and has been substituted by the Pardál brand from March 2007

in order to ensure that the Budvar brand is properly perceived as super-premium. The price of barrelled Budvar 10 was increased with a nine-month delay, bottled by up to seventeen months and with a very low correlation of 0.52. The price of non-alcoholic beer was raised a month after the price of Radegast Birell non-alcoholic beer's price was raised with an elasticity of 1.35 %. Over the monitored period, the non-alcoholic beer segment was the only segment to be growing well, meaning that a good sales policy could allow for even relatively large price increases, particularly from a low price base.

#### **PMS Přerov**

PMS Přerov is distributed mainly in Moravia and its market share over the monitored period ranged from 5.82 % to 4.59 %, although its local market share can be expected to be much higher. Its most well-known brand is Zubr. Barrelled Zubr 10 showed a growth in price levels with a delay of 4 months, bottled with a delay of two months. Barrelled Zubr 12 showed a delay of 11 months.

#### **Pivovar Svijany**

Pivovar Svijany can be considered a very atypical brewery. In 1998, production basically came to a stop, only for it to subsequently demonstrate very significant growth in production and market share. Over the monitored period, its share grew from 0.71 % to 2.53 %. The price modelling results also correspond closely with this development. For all three barrelled products (Svijany 10, Svijany 11 and Svijany 12), the company increased its price with a delay of two months after Plzeňský Prazdroj with high elasticity (1.24 – 1.39). The impact of the increase in excise duty was only statistically insignificant for Svijany 12. For bottled beer, there was a price increase after half a year for the Svijany 10 and Svijany 11 products and a price increase after 14 months for Svijany 12. Nevertheless, even for bottled beer elasticity was very high, and for Svijany 10 it even reached a value of 2.16 %. This very high elasticity for bottled beer is due to the fact that in the past, rather than the brewery's sales department actively contacting chainstores, it was the chainstores themselves which were more active in making contact, meaning the brewery had a simpler and more important position during discussions in terms of psychology than its actual significance on the market would suggest.

At the beginning of the monitored period, the Svijany brand could be perceived as only local, but today it is sold nationwide.

#### **Platan**

Similar to Starobrno and Zubr, Platan can be considered a brand active locally, particularly as far as barrelled beer sales are concerned. It is very difficult to ascribe the company's share of the Czech market, because over the monitored period the company produced the beers Primus and Klasik in the economy category for Plzeňský Prazdroj, without ownership connection between these companies. The author would estimate that its market share over the monitored period could range between 1 % and 1.5 %, although in its region the company has a much larger economic strength. In 2008, a newly emergent company, KBrewery Trade bought shares in the company, which had a positive impact on off-trade in particular. The price level of the modelled barrelled beer rose with a delay of one month with an elasticity of just over 1, which demonstrates the regional strength of the brand. In contrast, the price of bottled Platan 11 increased with a delay of a full year, as did the price of non-alcoholic beer.

#### **Černá Hora**

The Černá Hora brewery is also a strong regional brand with its share in the rest of the country significantly lower, even minimal. The national market share over the monitored period remained just below one percent.

For all three modelled barrelled beers (Černá Hora 10, Černá Hora 11 and Černá Hora 12), the results are basically identical and very stable. The company changes its price level 4 months after the price leader and its reaction is inelastic (0.56 % - 0.64 %). For bottled beers, the results are slightly less balanced. The delay length is similar, but the elasticity is significantly higher for the Černá Hora 11 brand, reaching a value of 1.16 %. The reason for this is that it is a relatively new product (from May 2004) and it had a low introductory price which rose significantly. Non-alcoholic beer showed a delay of 2 periods and an elasticity of 0.44 %.

#### **Bernard**

The Bernard brewery is markedly different to other similarly sized breweries. Although its market share over the monitored period was generally less than one percent, it is a brewery that operates nationwide and it is not a regional brewery. Even the sales and marketing tools it uses are those which are used by large breweries. This fact is reflected in the results, from which it is difficult to draw any conclusions, as the brewery does not even have economic strength

in its own region. This however in no way means that the brewery is economically unsuccessful.

## Conclusion

On the basis of the above detailed analyses, many types of price behaviour were observed for the second to eleventh largest breweries in the Czech Republic. The conclusions can be summarised into the following general points:

- it is much easier for breweries to increase their prices for barrelled beer than it is for bottled beer, because they have a much better bargaining position dealing with caterers than they do with chainstores. Breweries most commonly raise their price level for barrelled beer one or two months after the market leader Plzeňský Prazdroj raises its prices
- it is much easier for breweries to increase their prices for barrelled beer than it is for bottled beer, because they have a much better bargaining position dealing with caterers than they do with chainstores. Breweries most commonly raise their price level for barrelled beer one or two months after the market leader Plzeňský Prazdroj raises its prices,
- for barrelled beer, even breweries which have a relatively small market share nationwide but which are strong at least regionally are able to increase their prices a relatively short period after the price leader. If the brewery's market strength is spread out over a number of regions, the modelling results are unclear,
- the least stable results for barrelled beer are

seen by so-called eleven-degree beers, because at the start of the monitored period, only a couple of breweries had the product in their portfolios and so there was often a problem with achieving a sufficient number of degrees of freedom. Results are also inconsistent in that it is a dynamically developing segment,

- if we leave out the eleven-degree beer segment, ten-degree barrelled beer generally demonstrates slightly lower elasticity than barrelled twelve-degree beer. Thus, consumers of higher quality products do not take the price into account so much,
- for bottled beer, the opposite is true with stronger beers (larger degrees of Plato) showing lower elasticity,
- it is also interesting to note that in the non-alcoholic beer segment, larger companies (Pivovary Staropramen and Budějovický Budvar) show higher elasticity (1.34 % and 1.35 %) compared to smaller companies (Starobrno, Platan and Černá Hora) which have lower elasticity of comparable values (0.42, 0.43 and 0.44 respectively). Bernard is an exception, although its non-alcoholic beer in particular is supported with a large advertising campaign.

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