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Bargaining power in manufacturer-retailer relationships

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Bargaining Power in Manufacturer-Retailer Relationships*

Justus Haucap Ulrich Heimeshoff Gordon J. Klein
Dennis Rickert Christian Wey

Abstract

Research on bargaining power in vertical relationships is scarce. It remains particularly unclear which factors drive bargaining power between negotiating parties in a vertical structure. We use a demand model where consumer demand determines the total pie of industry profits. Moreover, we apply a bargaining concept on the supply side to analyze how profit is split between retailers and manufacturers. Estimates show that bargaining power can be explained by several decision variables for retailers and manufacturers. Options for both indicate that any analysis of bargaining power has to consider a dynamic view on the relevant parameters.

Keywords: Bargaining Power, Buyer Power, Antitrust, Discrete Choice, Demand Estimation

JEL Classification: L1, L4.

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1 Introduction

Bargaining power in retail markets has been subject to intense scrutiny by antitrust authorities around the world (e.g., Competition Commission 2000, 2008, OECD 2009). Because retail markets have experienced dramatic developments, such as the introduction of scanner devices or the rise of discounters, buyer power of retailers has also become a major issue in retail mergers.¹ A popular argument in such investigations is that increasing buyer power affects market structures both at the supplier side and the retailer side negatively. Increasing buyer power squeezes suppliers' profits which is supposed to increase supplier concentration.² At the same time, powerful retailers can bargain for more favorable deals which will lead to higher wholesale prices for smaller retailers (so called "waterbed effect," Competition Commission 2008). Theories like the one of the waterbed tend to neglect potential effects on consumers. In fact, it is unclear whether the waterbed effect has positive or negative effects on consumer welfare. Inderst and Wey (2007), for instance, show that high buyer power indeed affects the outside option of manufacturers negatively, but it can stimulate manufacturers to look for alternative strategies which then may have positive effects on welfare.

Furthermore, sectoral investigations of competition authorities also use frameworks which mostly rely on qualitative evidence and rather simple quantitative indicators like market shares and size (e.g., Competition Commission 2008, Inderst and Mazzarotto 2008). But the literature in empirical competition economics has made some tremendous progress. There are empirical studies that take advantage either of natural experiments in a reduced form framework or studies that use a structural econometric framework (Beckert 2011, Dranganska et al. 2011, Bonnet and Bouamra-Mechemache 2013). Those methods allow for a more detailed analysis of bargaining power determinants beyond size and local differentiation.

We contribute to the empirical analysis of bargaining power by identifying the factors which cause bargaining power in vertical relations. We build on Dranganska et al. (2011) who use a general framework considering category sales of the German coffee market in 2001/2002. They derive a structural econometric model and find several factors that have

¹See, for instance, the recent decision of the Federal Cartel Office on the Trinkgut/EDEKA merger in Germany (Bundeskartellamt 2010).

²Rent extraction is also supposed to reduce suppliers' investment incentives (European Commission 1999).

an impact on bargaining power parameter between manufacturers and retailers. Their approach has the advantage that it models retailer-manufacturer relationships depending on consumer demand, which determines the total profit pie parties bargain about.³ In particular, they highlight the importance of store brands and assortment depth. Since their focus lies on the formulation of a general model to reveal the distribution of bargaining power, the set of potential strategies which drive bargaining power is narrow. Most importantly, their data set does not comprise discounters on the retail side, whose role may be important in market delineation (Haucap et al. 2013). Closely related to this study is the work of Bonnet and Bouamra-Mechemache (2013) who use the general structural framework of Draganska et al. (2011) to investigate the French market for fluid milk. Their focus, however, is on the impact of organic labels on bargaining power.

Another aspect we include in our analysis is the impact of one-stop shopping on bargaining outcomes.⁴ This phenomenon changes the relationships between products and thus also affects parties' bargaining power. Based on results gained from a natural experiment from the beer market Heimeshoff and Klein (2013) examine empirically suppliers' strategies to become indispensable to retailers, thereby strengthening their own bargaining positions. They explain their findings with externalities of products which arise in the presence of one-stop buyers.

First of all, our study aims to measure the degree of bargaining power between retailers and manufacturers empirically and it explicitly includes the demand side. Our second aim is to uncover the importance of product- and market characteristics for bargaining power. We examine the latter by deriving potential determinants and showing how they are correlated to bargaining power. Our study focuses on a special category, the coffee market. This is done for two reasons. On the one hand, we investigate how different manufacturers and retailers bargain for (relatively) homogeneous products to find the distribution of bargaining power. On the other hand, we take advantage of a category that has experienced fundamental changes over time. Whereas the coffee market consisted of fairly standardized packages in the past, today products are more differentiated. Besides the standardized 500g packages, there is a non-neglectable fraction of espresso supply

³another application can be found in Bonnet and Dubois (2010) who estimate a structural econometric discrete choice model and uncover fixed transfers in a two part pricing model which determines endogenous bargaining power due to the outside alternative. Draganska et al. (2011) estimate the exogenous bargaining power differently.

⁴Caprice and von Schlippenbach (2013) and von Schlippenbach and Wey (2011) analyze the impact of one-stop shopping behavior vertical relations and parties' bargaining power.

and a trend towards coffee pod and capsule systems. This provides us with variation for identification.

Our idea for the empirical strategy follows the general framework of Draganska et al. (2011). In a first step, we derive bargaining power parameters in the coffee product category, before we show, in a second step, how several potential exogenous factors are correlated with bargaining power. However, we use a more detailed data set comprising the whole coffee market. In particular, we consider discount retailers, which play an important role because they account for a major part of private label supply. Moreover, we use a later and longer time frame that allows us to take into account several product innovations, which were, to some extent, disruptive in the coffee market (for instance coffee pods and capsule systems). Our data set contains information from the household panel of GFK Panel Services. This data set allows us to estimate a random coefficient random utility discrete choice model (in the fashion of Petrin and Train 2010) to obtain consumer substitution patterns and retailer respectively manufacturer margins (Bonnet and Dubois 2010). Using the estimates of our structural model, which is estimated by including real transaction prices, we obtain the price cost margins of retailers and manufacturers, which are then used to calculate the distribution of total rents (Bonnet and Dubois 2010, Draganska et al. 2011).

The strength of the data set is the detailed information on consumer behavior. Additionally, the selection of the coffee market as object of study has the convenient advantage to analyze the effects of innovations on the distribution of bargaining power in vertical relations. Such (structural) innovations are coffee pads and capsules which, due to the possibility to cook single portions, may be an interesting option for singles and other small households.

Similar to earlier research, our results indicate that it is a priori not clear whether bargaining power is concentrated on either retailer or manufacturer side. Quite the contrary, there seem to be different constellations. Moreover, we are able to highlight the effects of innovations, one-stop shopping behavior and the retailer's private label assortment. Innovations have an impact on the bargaining position of manufacturers. The size of the effect depends on various factors, but tends to be strong for different constellations. Furthermore, one-stop shopping behavior has a large impact on buyer power. Hence, the choice of particular strategies of both sides may significantly increase bargaining power.

Another interesting result is that a given state of the bargaining power in one period does not necessarily lead to a stable distribution of bargaining parameters over time. Quite the opposite, it may lead to shifts across time. Our results underline the necessity of a complex analysis in competition and antitrust analysis.

The paper is organized as follows. The following section 2 describes the data set and gives summary statistics. Section 3 introduces the empirical strategy, which is based on a three-step procedure. Results are given in section 4, before section 5 concludes.

2 Data and summary statistics

The main data set is a household panel provided by GfK Panels Services GmbH comprising purchasing decisions of up to 40.000 households. The selected subsample consists of all households who buy coffee within a time period of 2005-2008. The set of panel members is such that it represents the German population of coffee consumers. The crucial advantage of this kind of panel, besides its representativeness, is that all participants scan their purchases at home. Hence, not only actual transaction prices, discounts included, are observed, but also consumers' switching behavior between both, products and stores. Although information is available on a daily basis, we aggregate it to weekly household purchases to mirror typical shopping behavior. Data contains information on the type of coffee, that is ordinary coffee, espresso coffee or pod/ capsule systems. Overall, from the data structure, it is possible to derive some measures of retailer and manufacturer strategies. So it is possible to construct a proxy variable for one-stop shopping vs. multi-stopping behavior by using information on the ration of the purchased product and the value of the total shopping bill. Furthermore, it is possible to identify newly introduced products as a measure for strategic innovation. Finally, we construct measures for size, assortment depth and retailers' share of private label products.

Some information on the retail market structure is given by Figure (1). Obviously, discounters play a vital role on the market as they account for the highest market share (above 40 %). Hypermarkets and full-line distributors form most of the remainder. However, separation into these two formats is to some degree arbitrary and both could be merged into joint category. Although these formats cover most of the market, there is a

sizable fringe of coffee products sold at drugstores and at specialized coffee shops. Figure (1) also shows that the ratio of private labels is strongly increasing after the second year up to the end of the considered period. Moreover, there seems to be a kink in the retailer promotional prices in the second period. This indicates that the consideration of two separate 2-year period is a reasonable simplification because it ensures that no structural break drives the result.

Table (1) reveals some information on the shares of products bought within promotional activities, prices paid (normalized to gram, given that sizes of packages differ), units bought per purchase and values of purchases (in cents). Particularly, promotions are an important variable in the competitive environment since on average around 30% of units are sold during a promotion. The price is on average 0.56 Euro cents per gram. However, there is a very large dispersion of prices. They vary from less 1 cent per gram to up to 19.92 cents per gram. Comparable patterns apply to the dispersion of assortments and private label shares within retail stores. Additional information can be found for quantities bought, which is on average 1.8 units. This finding supports the assumption of consumers' weekly purchasing decisions that is often found in the literature. Next, the dispersion of the particular share of bill is rather large. Finally, we define producer-retailer bundles as product level, which basically means that consumers may perceive the same brand at two different stores differently. For the sake of estimatability, we only consider the 50 most often bought bundles. The reduction causes just a minor loss of overall sales. Only those customers appear in the panel who have at least bought once one of the 50 most bought bundles. Thus, the outside option solely includes the non-purchase of those households, who appear in the pre-selected subset. That implies a selection process of those consumers who buy one of the products with highest market shares. But as our top 50 subsample covers about 90% of the whole market, we assume that this selection does not affect the overall outcome.⁵

Furthermore, we have gathered data from several other sources to gain information, that is cost shifter, on the supply side (Table 2). These additional data includes energy costs, with information on oil prices and traded raw coffee from a Thompson Reuters database. In cases where data is only available on monthly level interpolation techniques are used. Finally, information on wages in Germany is provided by the German Statistical Office.

⁵ We consider households only if they have purchased one of the top 40 combinations, otherwise they drop out of the sample. Still, we loose only about 10% of the sample.

3 Empirical Strategy

The aim of this study is, on the one hand, to reveal bargaining power between manufacturers resp. retailers and, on the other hand, to find determinants of this bargaining power. To uncover this relationship in detail, we focus on one specific product category, which is coffee. This provides us with the possibility to reveal bargaining power between retailer and manufacturer on a product level. Hence, the distribution of buyer power for a particular coffee capsule or a particular coffee sub brand is what can be observed. Moreover, the coffee category is interesting because it was subject to dynamic changes. First, innovations, such as coffee capsule systems, have increased variety in the category. Besides standardized 500 gram coffee “blocks”, different packages with varying sizes for different coffee machine systems can be found. Second, there was a shift in consumer preferences, which is supported by the fact that demand for specialized coffee products, like organic or fair traded coffee, has increased. That change in the industry structure offers possibilities, especially for manufacturers, to differentiate themselves from competitors.

To identify bargaining positions between retailer and manufacturer, we apply a structural econometric approach, which follows the general method proposed by Dranganska et al. (2011) and is similarly used in Bonnet and Bouamra-Mechemache (2013). The idea is, first, to identify the demand for each product. Following the literature (e.g., Bonnet and Dubois 2010), we apply a random coefficient logit model to estimate demand for each household. In contrast to approaches which rely on aggregate data (e.g., Berry et al. 1995), we have disaggregated information that allows a rather precise estimation of the underlying substitution patterns. This is essential for a proper structural model. We use a control function, which is the estimated residuals of a price regression on product characteristics and cost shifters, to tackle to potential price endogeneity (Petrin and Train 2010). In a second step, we use the predicted market share response matrix to compute the whole industry’s conjectures. At this point, the model does not identify the particular bargaining power distribution. Therefore the yet revealed information is used to determine a bargaining power parameter. In a last step, we regress the bargaining power parameter on retailer-, manufacturer- and product characteristics to understand, what drives the bargaining power distribution.

3.1 Derivation of the Bargaining Power patterns.

3.1.1 First Step: Estimation of bargaining power.

The first step in the determination of buyer power parameters is the estimation of demand. We follow the literature estimating demand in retail markets, for instance, Sudhir (2001), Draganska et al. (2011), Bonnet and Dubois (2010), Bonnet et al. (2013) and Haucap et al (2013). Therefore, we apply a random coefficient discrete choice model for disaggregated consumer level data. These models have been widely used in the literature because they allow for consumer heterogeneity, product heterogeneity and correlation over time in the error term (Train 2003) ⁶.

The implementation of estimation follows Hole (2007) and as in Petrin and Train (2010), we use a control function approach. The control function is measures unobservable supply shocks and enters as an additional variable into the regression equation to account for the problem of endogeneity.⁷ The indirect utility for consumer n from a retailer product j at time t is

$$U_{njt} = \alpha_j - \beta_n p_{jt} + X_{jt} \beta + \phi \mu_{jt} + \tilde{\epsilon}_{njt}, \quad (1)$$

where α_j is a product-fixed effect, p_{jt} the is the price variable with coefficient β_n , which is log-normally distributed over n individuals. X_{jt} is a vector for product characteristics, of which we consider promotion. μ is the control function with corresponding parameter ϕ . The error term $\tilde{\epsilon}_{njt}$ is an independently and identically draw from GEV distribution of type I (Petrin and Train 2010). For time t , when consumers do not purchase, an outside good is specified. Because only differences of utility are considered, the utility for the outside good $j = 0$ can be normalized to zero, i.e., $U_{n0t} = 0$.

The control function μ is implemented to tackle the potential endogeneity of price. It takes advantage of cost shifter, that are similarly used by Ailawadi et al (2008), Bonnet and Dubois 2010 and Bonnet et al. (2012), to control for unobserved factors that may be correlated with the price, such as quality. In particular, we take into account coffee costs

⁶Nice examples for models using disaggregated data are Train (1998), Bonnet and Requillart (2011).

⁷See also the similarly approach in own work, where we estimate demand on the market for baby diapers (Haucap et al. 2013).

as well as general production costs (energy,oil,diesel,wages). This strategy should ensure that the true demand curve is consistently estimated.

3.1.2 Supply Side

The estimation of the demand function provides input which is required for the computation of the supply side model. As discussed in Draganska et al. (2011) negotiations in retailing could be modeled in a non-cooperative manner with sequential structure. Parties regularly meet to propose offers and to face counteroffers. Since empirically the bargaining procedure and timing can hardly be observed, we implement the Nash bargaining solution to find the profit maximizing profit split by looking at the set of all possible bargaining outcomes. In fact, it can be shown, that, under certain circumstances, the solution of the Rubinstein alternating offer game converges to the solution of the asymmetric Nash bargaining problem (the proof is given in standard text books, e.g., Muthoo 2004, pp. 65-67). The outcome of the Nash program is driven by the bargaining position, also referred to as the disagreement point or outside option, and by the bargaining power parameter. The former can be described as the outcome achieved when negotiation fails, whereas the latter is influenced by (mostly exogenous) factors, such as the tactics employed by the parties, the conduct of negotiations, the information structure and the ability to stay patient (Muthoo 2004, p.35). Since we are able to derive disagreement profits using counterfactual substitution patterns (i.e., the market shares which would occur if negotiation between two parties on a product fails), the bargaining power parameter of the Nash solution is solely influenced by exogenous factors (Draganska et al 2011).

Analogously to Draganska et al. (2011), the maximization via Nash bargaining solution is conducted under certain assumptions. We assume that each retailer-manufacturer pair bargains with each other one at a time. Within each pair bargaining happens simultaneously, so that manufacturers do not observe retail prices when they bargain over wholesale prices and retailers do not anticipate wholesale prices when setting retail prices. Finally, neither party takes future negotiations into account and focuses only on current negotiations. As in Draganska et al. (2011) a set of feasible payoff combinations is specified for cases of both: successful negotiation as well as breakdown.

To derive exogenous bargaining power, we follow a standard Nash-Bargaining Framework

in a setting with linear prices:⁸

$$\arg \max_{p_j^w} (\Pi_j^r(p_j^w) - \Delta_j^r)^\lambda (\Pi_j^w(p_j^w) - \Delta_j^w)^{1-\lambda}, \quad (2)$$

The Nash-Bargaining setup denotes the differences in profits for successful and unsuccessful bargaining for each party. For every product j , it contains the difference of profit $\Pi_j^r(p_j^w)$ resp. $\Pi_j^w(p_j^w)$ and the disagreement point Δ_j^r resp. Δ_j^w for each player. In order to obtain the profit maximizing solution, we have to find the wholesale price p_j^w , which maximizes the channel profits of both the manufacturer and the retailer. The particular distribution of the profits is indicated by the factor λ . Profits are derived from standard linear pricing models between manufacturer and retailer (either vertical Nash or Bertrand-Stackelberg) with Nash competition among retailers on the final product level.⁹

From now on, we use vector notation and solve the Nash bargaining game w.r.t. to the profit-sharing wholesale price p^w . Some rearrangements yield the manufacturer margins:^{10,11}

$$m^w = p^w - c^w = \left(\frac{1-\lambda}{\lambda}\right) [\Omega^w * S_p]^{-1} [\Omega^r * S_p] [\Omega^r * S_p]^{-1} s(p), \quad (3)$$

where Ω^r and Ω^w are the identity matrices of retailers and manufacturers. S_p and $s(p)$ represent market share response matrix and market shares respectively.

We assume Nash behavior among retailers and take the first order condition of $\Pi^r = (p_j - p_j^w - c_j^r)s_j(p)$ to determine retail margins. Then, we solve for the price-cost margin of retailers and use vector notation to obtain the retail margin m^r (Draganska et al. 2011).

⁸This approach follows Draganska et al. (2011) and Meza and Sudhir (2011). However, theory shows that there may be more complex contracting models such as Two-Part tariff models or models with Resale Price Maintenance. But in cases of non-linear contracts, λ is not identified in the estimation. This is a problem literature still has to solve.

⁹As for instance Bonnet et al. (2013) show, it is possible to deviate from linear models. However, since we are interested in the qualitative size of the λ parameter, this assumption seems to be appropriate.

¹⁰Draganska et al. (2011).

¹¹Disagreement profits are explicitly considered.

12.

$$m^r = p - p^w - c^r = -[\Omega^r * S_p]^{-1} s(p). \quad (4)$$

Adding up profits from both stages yield total channel profits M similar to Draganska et al. 2011¹³:

$$M = m^r + m^w = -\left(\frac{1-\lambda}{\lambda}\right) [\Omega^w * S_p]^{-1} [\Omega^r * S_p] + I) [\Omega^r * S_p]^{-1} s(p), \quad (5)$$

Retail margins are by definition independent of the exogenous bargaining power parameter λ , while manufacturer margins are dependent on the outcome of bargaining power and are scaled by the factor $(\frac{1-\lambda}{\lambda})$.

This function enables us to use the information on changes in the disagreement Δ and the marginal effects S_p to identify the margins of the manufacturer. However, since the parameter λ is not identified, we estimate a model, which predicts the margin that remains for the wholesaler if he cannot fully appropriate the margin:

$$M = \beta_1 * week * brand + \beta_2 * week^2 + \beta_3 * week^3 + \frac{1-\lambda}{\lambda} * m^w * product + \mu, \quad (6)$$

The estimation then yields the bargaining power parameter. Since estimation may be biased, outliers that have a margin twice the size of the median margin are excluded. Furthermore, averaged marginal effects are used because predicted margins vary substantially between the weeks and such a high variation is not a reasonable assumption.

Finally, private labels are accounted for under the assumption that retailers are vertically integrated with respect to their own products. Hence, manufacturer margins are zero (e.g., Bonnet and Dubois 2010).

¹²The product subscript j is dropped for convenience,

¹³ I denotes the identity matrix

3.2 Second Step: Estimation of bargaining power determinants.

The second step, i.e., the estimation of the determinants of bargaining power, is quite intuitive. Bargaining power estimates for each retailer-manufacturer bundle from the first stage are regressed on several factors, which may facilitate bargaining power. This, clearly, does not reveal causal relationships, however, important correlations can be found that provide a hint for further analysis on causal effects. Thus, the following relationship is estimated.¹⁴

$$\lambda = \beta_0 + \beta_r * X_S + \beta_r * X_{RS} + \beta_w * X_{MS} + \mu \quad (7)$$

The estimation equation comprises two kinds of factors. On the one hand, market structure variables, X_S , such as size and one stop shopping behavior. On the other hand, variables that are affected directly by retailer and manufacturer decisions (X_{RS} and X_{MS}). Clearly, size and one stop shopping behavior are related to decisions, but we interpret those as an outcome of decisions rather than as decisions themselves. Retailer strategies, captured by X_{RS} , includes assortment depth and private label assortment, whereas the vector X_{MS} contains manufacturer strategies, such as innovation. In particular, we comprise two types of innovation: All new products introduced and radical innovation, which is defined as the arrival of pad and capsule systems that radically altered market structure.

4 Results

4.1 Demand Estimation

Table (3) provides information on the estimation of the control function. The explanatory power is rather high, as indicated by the large R^2 . Moreover, cost shifters are significant in general. The, in some cases surprising negative effect of coefficients on price is mainly

¹⁴In this step, only manufacturer brands are included in the estimation. In the case of private labels, it is assumed that the retailer holds the whole bargaining power. This assumption, although technically necessary, may be misleading in the interpretation of bargaining power determinants.

due to collinear effects across the different shifters. Furthermore, we treat each shifter as a unique exclusion restriction. We use several cost shifters (energy price, oil price, wage and arabica coffee prices) for the construction of the control function.

For demand estimation the data set is split into two subsets (2005/2006 and 2007/2008) and for each subset, we estimate a random effects model. Table (4) implies that for both time periods, the taste heterogeneity among consumers is rather high and makes which provides additional support for the model we estimated. Table (4) shows that the control function has an significant impact on the estimation for both periods. Besides the control function, some marketing mix variables, that is price, with random taste preference, and a promotion variable are included. Since the model is non-linear, the factors cannot be interpreted directly. That is why marginal effects have to be calculated for interpretation.

4.2 Margins and Bargaining Power estimations

Table (5) shows the margins on the product level, which we have recovered, expressed as percentage share of the retail price for both manufacturers and retailers.¹⁵ By definition private label products have been treated as if they were vertically integrated. It has to mentioned that in some cases we treat some non-private label products as vertically integrated, which means that one manufacturer optimizes channel profits for several bundles. This has been the case for a provider of shop-in-shop coffee systems as well as a provider of a particular capsule system. In these cases linear approximations yield unreasonable negative values providing a hint that the pricing scheme is more complex and a model of two-part tariffs would be more appropriate here. A higher R^2 , as a rough indicator of model fit, in the estimation of bargaining power gives some additional support for this presumption. Since it was not able to incorporate these case into the model in a “proper” way, we exclude them from the bargaining power distribution Tables. Presumably, firms can only incorporate those pricing schemes without a certain amount of bargaining power.

Table 7 shows the λ 's corresponding to retailer power respectively the $1 - \lambda$ corresponding to manufacturer power. The distribution of bargaining power varies strongly across different retailers. While some have a relatively high bargaining power, others do not.¹⁶

¹⁵We have not considered predicted values with unreasonable value where total margins exceed the price.

¹⁶Due to confidentiality agreements with the data provider, we cannot state names of the retailers.

Hence, the distribution of bargaining power (SD) is rather high. The Tables of distribution are presented with and without considering private labels.¹⁷ Since private labels are treated as high bargaining power products, it is evident, that excluding them leads to a comparatively lower retailer bargaining power. However, the general finding is that retailers are more powerful than manufacturers.¹⁸ Our results differ from results found by Draganska et al (2011). However, all our findings for both periods are comparable. Without considering manufacturer with a very low bargaining power, the situation improves for manufacturers in the second period. When we take into account the non-powerful manufacturers, there is hardly any change.

While the findings shown in Table (7) are unweighted for product bundles, Table (6) analyses the different bargaining power estimates for each product bundle. It can be easily seen that different bundles have a large dispersion in the bargaining power. Notably, the patterns for both periods are comparable. Summarizing the outcome of the average bargaining power estimates shows that, if we consider private labels as high powered products, retailers have more bargaining power than manufacturers. Nonetheless, if we do not consider them, there is an equal distribution among retailers and manufacturers. The implications of this finding are interesting and suggest that due to private labels retailers can have a good overall category bargaining power. This does not translate necessarily into higher bargaining power regarding brand manufacturers. The following subsection will give some insight on this.

4.3 Determinants of Bargaining Power

Table (8) relates several structural and strategical firm characteristics to bargaining power outcomes. Those results have to be interpreted as correlations, not as causal effects. On the one hand, this is due to the OLS regression which only can show directions and on the other hand bargaining power is an estimated parameter, which only show variance across the two estimation periods. Therefore, interpretation relies mostly on cross sectional

¹⁷Private labels are, by assumption, associated with a bargaining power of one. This is a common assumption in the literature. Still, there may be more complex contractual arrangements that are not explicitly captured.

¹⁸One estimation of bargaining power indicates a slightly negative value for a manufacturers bargaining power. Since all buyer power estimations are subject to certain estimation errors. The estimation includes the zero in the confidence interval.

variation and may be subject to measurement error.

Column (1) introduces retailers' size as a first control variable. Interestingly size does not have any significant effect. Column (2) shows the impact of a discounter dummy to analyze if discounters have a higher bargaining power than other retailers. Furthermore the variable "Share of private labels" (column (3)) is introduced to uncover the sources of advantageous positions of discounters via strategic behavior as private labels may be used to attract consumers. Results show that this kind of positioning via decisions regarding private label assortment has a significant effect on the retailers' bargaining power.

For deeper analysis, we introduce a "specialty" variable which is related to manufacturer's strategies. The variable "One-Product Shopper" measures the impact of the effect of the ratio purchasing value of the product to the overall bill. If this ratio is rather large (we took the 99 percentile, which is the share of bill larger than 60%), it can be interpreted that the product attracts customers and people enter the store just because of this product, so called brand loyal consumers or "bargaining hunters", who could possibly weaken retailers' power. However, the effect is not significant and therefore cannot be denoted as different from zero.

Next, we introduce two more variables which measure the overall retailers' or manufacturers' average share of the bill. While we cannot find any significant effects for retailers, there is a strong significant effect for manufacturers. This means that those manufacturers, whose products attract customers into the retail shops have a large degree of bargaining power. Stated differently, this can be interpreted as a reverse one-stop shopping variable, where one-stop shopping (i.e., a decreasing share of one product) increases retailers' bargaining power.

Still, retailers may have strategic decision variables to design their store in a way to attract customers and thus be also attractive for manufacturers. Thus, column (5) controls for assortment depth, but there seem to be no significant and positive effect. Column (6) now introduces manufacturers innovational activity. Manufacturers' innovations enhance the retailer's bargaining power. This result seems puzzling, but it maybe that products associated with risk -also for the retailer- are more difficult to introduce. In Column (7) manufacturer fixed effects enter, without changing the basic results in most variables. However, for the assortment depth, which may be highly correlated to specific branded products only in some stores, it may well be a collinearity issue.

Table (9) considers a in-depth analysis of manufacturer innovation.¹⁹ Column (1) interacts innovations with retailers' private label share. The strong negative and significant effect indicates that in the case of many private label products, innovative manufacturers have relatively large bargaining power. Column (2) interacts retailers' share of the bill with innovations. The effect is negative and significant at a 5% level showing that a high bill paid at the checkout counter is correlated negatively to manufacturer innovations. This is a reasonable result since retailers that depend on shoppers that only come only for the coffee have lower bargaining power with increasing innovations. Column (3) considers the impact of the manufacturer's average share relative to the overall bill. If someone enters the shop only for a certain manufacturer's products this seems to be negatively correlated to buyer power. A possible explanation is that if shoppers enter retailers' stores just for one specific product, the incentive to provide good conditions is limited since the retailer cannot attract consumers to shop for other products. Therefore, one stop shopping externalities are limited. While column (2) provides a dependency argument, column (3) highlights an externalities argument.

5 Conclusion

We estimated a structural econometric model to recover the relationship of manufacturers' and retailers' bargaining power. We have found that bargaining power is not uniformly distributed across retailers and manufacturers. Moreover, it seems that it depends strongly on the specific bargaining constellation since bargaining power varies among manufacturer-retailer pair and standard deviations of the estimates are relatively high. This clearly shows that bargaining power should be assigned via a case-by-case analysis.

The most important finding is that -even though the analysis faces uncertainties in the precision- different strategies have been found that are strongly correlated with changes in bargaining power.

Decisions about the introduction of private labels and about assortment decisions are important strategies for retailers to strengthen their own bargaining power. For man-

¹⁹Because product-manufacturer combinations and control variation are interrelated, the degrees of freedom are not sufficient to use cluster robust standard errors Hence results are just heteroscedasticity robust, which leads to downward biased standard errors.

ufacturers, innovations can be successful under certain circumstances. It is found that bargaining power also depends on the buying patterns of consumers, i.e., whether retailers are visited by either a high share of one-stop shoppers or by a high share of one-product shoppers. Despite the strength of the results of our static model, it has to be stated that, further analysis should consider dynamic trends and developments. This could provide new insights for research on antitrust, but makes profound analysis lamentably more difficult. Finally, further research should differentiate between low- and high quality private label products.

From a policy perspective our analysis shows, that it is not possible, and not desirable, to give firms an overall rating with regard to their bargaining power, because bargaining power differs substantially between different products and fluctuates over time. As a result, competition authorities should sharpen their focus on case-by-case analyses and on the dynamic change of bargaining power over time. Our analysis shows that bargaining power varies among the different bargaining pairs. That means, that one retailer may have large bargaining power in one setup but have low bargaining power in another. In the light of buyer power, the results suggest that a general finding on whether retailers have buyer power or not is not possible because buyer power clearly depends on the setup.

Finally, our approach is particularly helpful for competition authorities because it explicitly models retailer-manufacturer relationships (and potential bargaining power) depending on actual consumer demand. This can be helpful when the effect of bargaining (buyer) power on consumer welfare is aimed to be evaluated.

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6 Appendix

Figure 1: Panel Data 2005-2008

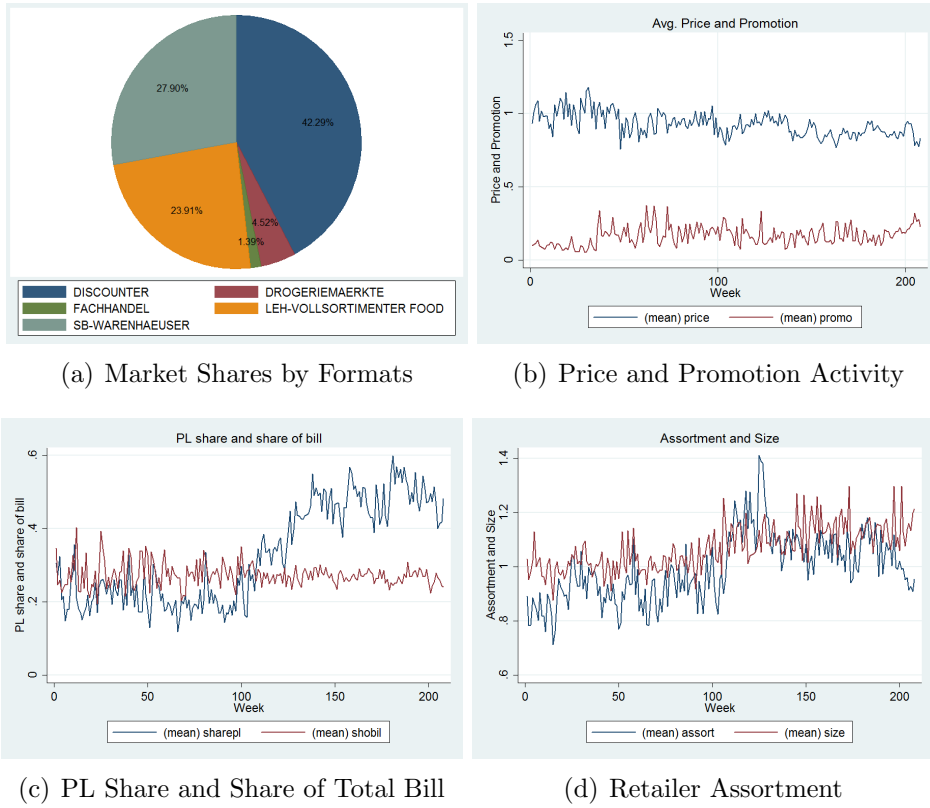


Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.
Promotion	0.297	0.457	0	1
Private Label	0.331	0.47	0	1
Price per Gramm	0.561	0.395	0	19.912
Quantitiy bought	1.801	1.712	1	36
Value of Coffee Purchase	542.719	520.852	0	23980
Share of Bill	0.25	0.225	0	5.38
Private Labels in total	0.331	0.47	0	1
Retailer's Share of Private Label	0.331	0.37	0	1
Retailer's Assortment	24.281	16.349	1	61
N= Observed Transactions		556025		

Table 2: Summary Statistics Cost Shifter, weekly basis 2005-2008

Variable	Mean	Std. Dev.	Min.	Max.
Arabica	172.351	47.263	83.84	268.79
Diesel	32.233	8.92	9	71.125
Energy	32.007	12.346	1.64	64.59
Paper	688.133	14.322	659	705.13
Plastic	1.132	0.153	0.65	1.505
Work	97.886	4.054	89.084	108.61
N		208		

Table 3: Control Function Results

Variable	05/06		07/08	
Work	0.001121	(0.000007)	-0.001101	(0.000006)
Plastic	-0.174194	(0.000272)	0.082846	(0.000169)
Paper	-0.002620	(0.000009)	-0.000182	(0.000004)
Energy	0.001398	(0.000003)	-0.000434	(0.000002)
Diesel	0.000551	(0.000003)	0.000077	(0.000005)
Arabica	-0.001735	(0.000002)	-0.001172	(0.000002)
Robusta	0.001298	(0.000002)	0.000830	(0.000002)
FE	YES		YES	
N	39331850		40743700	
R2	0.711		0.712	

Table 4: Estimation results : Random Coefficients Logit 05/06 and 07/08

Variable	Coefficient 05/06	(Std. Err.)	Coefficient 07/08	(Std. Err.)
Equation 1 : Mean				
Control Function	0.155	(0.003)	2.13	(.030)
Promotion	-0.666	(0.017)	-0.700	(.007)
Price	-1.993	(0.036)	-0.760	(.020)
Equation 2 : SD				
Price	1.204	(0.031)	1.987	(.0192)

Table 5: Margin Distribution

	Observed Bundle	% Retailer Margin	% Manufacturer Margin	Observed Bundle	% Retailer Margin	% Manufacturer Margin
1	0.69	0.00	0.00	33	0.43	0.00
2	0.72	0.00	0.00	34	0.42	0.00
3	0.44	0.00	0.00	35	0.47	0.00
4	0.45	0.43	0.40	36	0.34	0.00
5	0.44	0.44	0.39	37	0.43	0.00
6	0.44	0.27	0.25	38	0.27	0.00
7	0.44	0.44	0.00	39	0.34	0.00
8	0.50	0.00	0.00	40	0.22	0.00
9	0.00	0.00	0.00	41	0.23	0.17
10	0.33	0.00	0.00	42	0.30	0.11
11	0.43	0.33	0.44	43	0.69	0.00
12	0.35	0.43	0.35	44	0.69	0.00
13	0.44	0.44	0.43	45	0.62	0.00
14	0.36	0.21	0.24	46	0.67	0.00
15	0.39	0.39	0.42	47	0.80	0.00
16	0.27	0.27	0.30	48	0.74	0.00
17	0.22	0.42	0.30	49	0.76	0.00
18	0.42	0.21	0.21	50	0.00	0.00
19	0.30	0.00	0.00	51	0.91	0.00
20	0.29	0.32	0.31	52	0.91	0.00
21	0.29	0.31	0.33	53	0.37	0.30
22	0.29	0.34	0.34	54	0.24	0.28
23	0.19	0.19	0.19	55	0.25	0.23
24	0.14	0.22	0.20	56	0.31	0.27
25	0.16	0.20	0.17	57	0.34	0.41
26	0.20	0.17	0.21	59	0.96	0.00
27	0.27	0.21	0.21	60	0.84	0.00
28	0.32	0.00	0.00	61	0.89	0.00
29	0.47	0.00	0.00	62	0.94	0.00
30	0.30	0.00	0.00	63	0.26	0.21
31	0.30	0.00	0.00	64	0.16	0.26
32						

Consider that values with zero manufacturer margin are private labels.

Private Labels' Retailer margin denotes the whole channel profit.

Table 6: Bargaining Power; Retailer-Manufacturer Bundles

Pair 05/06	Ret.	Man.	λ	Pair 07/08	Ret.	Man.	$1 - \lambda$
4	2	2	0.746				
5	3	2	0.713				
6	4	2	0.705	6	4	2	0.563
7	9	2	0.33	7	9	2	0.418
12	2	4	0.754	12	2	4	0.766
13	3	4	0.588	13	3	4	0.572
14	4	4	0.658	14	4	4	0.764
15	7	4	0.52	15	7	4	0.683
16	9	4	0.268	16	9	4	0.385
17	10	4	0.761	17	10	4	0.546
18	12	4	0.478				
19	3	4	0.286	19	3	4	0.384
21	2	6	0.542	21	2	6	0.509
22	3	6	0.472	22	3	6	0.56
23	7	6	0.76	23	7	6	0.346
24	8	6	0.47	24	8	6	0.486
25	9	6	0.307				
26	11	6	0.321	26	11	6	0.345
27	12	6	0.287				
28	2	8	0.282	28	2	8	0.303
29	4	8	0.289	29	4	8	0.425
41	3	10	0.465				
				53	3	2	0.504
				54	4	4	0.372
				55	7	4	0.326
				56	3	6	0.529
				57	4	6	0.639
				58	3	14	1.059
				63	3	2	0.316
				64	9	2	0.32
No of PL	28				26		
Total	With PLs		0.769		0.762		
Total	Without PLs		0.500		0.505		

Table 7: **Bargaining Power Retailer Manufacturer; unweighted**

05/06				07/08			
Retailer	λ	Man	$1 - \lambda$	Retailer	λ	Man	$1 - \lambda$
2	0.761	2	0.376	2	0.763	2	0.576
3	0.725	4	0.461	3	0.72	4	0.467
4	0.85	6	0.549	4	0.72	6	0.512
7	0.749	8	0.714	5	0.765	8	0.636
8	0.735	10	0.535	6	0.743	14	-0.059
9	0.581	11	0.537	7	0.531		
10	0.92			8	0.849		
11	0.321			9	0.345		
12	0.382			10			
				11			
Total (With PL)	0.769		0.231		0.762		0.238
Total (Without PL)	0.669		0.331		0.6795		0.3205

Table 8: Regression of Bargaining Factors 2005-2008 I

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Size	0.0627 (0.0600)	0.0674 (0.0582)	0.0570 (0.0603)	-0.0334 (0.0614)	-0.1036 (0.0741)	-0.1034 (0.0745)	-0.0533 (0.0714)
Discounter		0.0840 (0.0720)	-0.1030 (0.1029)				
Share Private Labels			0.4465* (0.2348)	0.2242* (0.1261)	0.2028* (0.1079)	0.2033* (0.1087)	0.1749* (0.0891)
One Product Shopper				-0.0578 (0.0565)	-0.0354 (0.0451)	-0.0356 (0.0451)	-0.0950* (0.0515)
Average Size of the Bill (Manufacturer)				-2.4545** (1.0206)	-2.2543** (0.9711)	-2.2524** (0.9736)	-8.6925*** (1.0211)
Assortment Depth					0.2844* (0.1546)	0.2836* (0.1557)	0.1969 (0.1319)
Manufacturer Innovation						-0.0069	0.0586*
Producer FE	x	x	x	x	x	x	x
Time Controls							
R^2	0.0178	0.0592	0.1569	0.2839	0.3254	0.3255	0.5375
N	5096	5096	5096	5096	5096	5096	5096

Standard Errors are Clustered on a Specific Product-Retailer Bundle.

Table 9: Regression of Bargaining Factors 2005-2008 II

Determinants of Bargaining Power			
	(1)	(2)	(3)
Size	-0.0540*** (0.0088)	-0.0537*** (0.0088)	-0.0537*** (0.0088)
One Product Shopper	-0.0945*** (0.0096)	-0.0949*** (0.0096)	-0.0949*** (0.0096)
Average Size of the Bill (Retailer)	0.0539 (0.0359)	0.0498 (0.0360)	0.0498 (0.0360)
Average Size of the Bill (Manufacturer)	-8.6968*** (0.0960)	-8.6924*** (0.0958)	-8.6924*** (0.0958)
Share Private Labels	0.1767*** (0.0108)	0.1741*** (0.0109)	0.1741*** (0.0109)
Assortment Depth	0.2004*** (0.0171)	0.1966*** (0.0170)	0.1966*** (0.0170)
Manufacturer Innovation	0.2027*** (0.0152)	0.3133*** (0.1111)	-0.0740 (0.0534)
<i>x Share Private Label</i>	<i>Interaction Terms: Manufacturer Innovation</i>		
	-0.3425*** (0.0340)		
<i>x Average Size of the bill (Retailer)</i>		-1.0235** (0.4336)	
<i>x Average Size of the bill (Manufacturer)</i>			0.4733** (0.2005)
R^2	0.5379	0.5375	0.5375
N	5096	5096	5096

Standard Errors are Robust to Heteroscedasticity.

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