Düsseldorf Institute
for Competition Economics

DISCUSSION PAPER

No 329

Multi-Product Bargaining, Bundling, and Buyer Power

Markus Dertwinkel-Kalt,
Christian Wey

December 2019

HEINRICH HEINE
UNIVERSITÄT DÜSSELDORF

d|u|p düsseldorf university press

IMPRINT

DICE DISCUSSION PAPER

Published by

düsseldorf university press (dup) on behalf of
Heinrich-Heine-Universität Düsseldorf, Faculty of Economics,
Düsseldorf Institute for Competition Economics (DICE), Universitätsstraße 1,
40225 Düsseldorf, Germany
www.dice.hhu.de

Editor:

Prof. Dr. Hans-Theo Normann
Düsseldorf Institute for Competition Economics (DICE)
Phone: +49(0) 211-81-15125, e-mail: normann@dice.hhu.de

DICE DISCUSSION PAPER

ISSN 2190-9938 (online) – ISBN 978-3-86304-328-5

Multi-Product Bargaining, Bundling, and Buyer Power*

Markus Dertwinkel-Kalt† Christian Wey‡

December 2019

Abstract

We re-consider the bilateral bargaining problem of a multi-product, manufacturer-retailer trading relationship. O'Brien and Shaffer (Rand JE 35:573-598, 2005) have shown that the unbundling of contracts leads to downward distorted production levels if seller power is strong, while otherwise the joint profit maximizing quantities are contracted (which is also always the case when bundling contracts are feasible). We show that the unbundling of contracts also leads to downward distorted output levels when the buyer firm has sufficient (Nash) bargaining power (i.e., buyer power). Our result is driven by cost substitutability (diseconomies of scope).

JEL-Classification: L13, L41, K21.

Keywords: Vertical Restraints, Bundling, Buyer Power.

---

*Christian Wey gratefully acknowledges financial support by the German Science Foundation (DFG) for the research project "Market Power in Vertically Related Markets."

†Frankfurt School of Finance and Management. Email: m.dertwinkel-kalt@fs.de.

‡HHU Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Email: wey@dice.hhu.de.

1 Introduction

In the retailing industry, large manufacturers like Coca-Cola (carbonated soft drinks), Beiersdorf (cosmetics), Nestlé (e.g., mineral water, baby food, pizza) or Heinz-Kraft (e.g., condiments/sauce and cheese/diary) offer a range of products within a category which they sell to retailers. Large supermarket chains, as, e.g., Tesco (UK), Carrefour (France) or Edeka (Germany) invariably negotiate contracts that span manufacturers' entire product lines. In addition, the price schedules are likely to be often nonlinear (e.g., involving fixed payments, quantity and promotional discounts etc.) and may also involve bundling features such as aggregate discounts on list prices or promotional fees that depend on aggregate quantities delivered (OECD 1998, FTC 2001).

Bundling and "bundled discounts/rebates" are critically watched by competition authorities. The main concern is that bundling (or related tying and exclusivity clauses) can foreclose upstream competitors from getting access to retailers' shelves. A prominent case is the EU Commission's settlement decision with Coca Cola (EC 2005). The Commission found that Coca Cola imposed (besides other things) "tying" and "assortment and range provision" on buyers so as to force them to buy the entire product range of carbonated soft drinks. Buyers were —among others— retail chains. The Commission's settlement decision (EC 2005) significantly limits Coca-Cola's ability to offer rebates conditioned on aggregate amount of sales; in other words, it requires Coca Cola to unbundle its offers so that rebates are constrained to be article-specific.[1,2]

In this paper we make the following simple point in favor of bundling practices: In negotiations between a multi-product upstream firm and a single downstream firm, efficiency requires that the multiple products are bundled when the products are substitutable in both demand and cost. Forcing the firms to unbundle the products leads to inefficiencies such that quantities are distorted downward below the monopoly levels, which results in higher consumer prices and

[1]A related case is *Michelin II* (Case T-203/01, Michelin v. Commission, 2003, E.C.R. II-04071), where the Commission found that Michelin's rebate scheme (which also included bundling features) violated Article 82 (abuse of dominant position). See Motta (2009) for an in-depth discussion of the used rebates in this case.

[2]See Nalebuff (2005), Wright (2006) and Klein and Lerner (2008) for competition policy cases in the US which deal with bundling practices in vertical relations. Jeon and Menicucci (2012) also highlight several bundling cases in their paper on competition for slots.

reduced social as well as consumer welfare. In short, unbundling creates a “pick-and-choose” option on the weak bargaining party’s side, which is countered by downward distorted quantities in the negotiation process.

The idea is the following: Let $R(q_1^I, q_2^I)$ be the maximized revenue in the final-goods market, $C(q_1^I, q_2^I)$ be the cost of production, and $q_1^I > 0$ and $q_2^I > 0$ be the unique joint profit-maximizing quantities. Suppose the buyer has all the bargaining power. Then an efficient contract would have the buyer offering to buy a bundle of q_1^I and q_2^I in exchange for payment $T(q_1^I, q_2^I) = C(q_1^I, q_2^I)$. The seller would accept this offer and the joint profit-maximizing outcome would be realized. If bundling is not allowed, however, the first-best cannot be obtained and quantities are distorted downward. Offering to pay $T(q_1^I, 0)$ for q_1^I units of product 1 and $T(0, q_2^I)$ for q_2^I units of product 2 such that $T(q_1^I, 0) + T(0, q_2^I) = C(q_1^I, q_2^I)$ does not work, for example, because the seller would accept only one offer (given cost substitutability, which implies $C(q_1, q_2) > C(q_1, 0) + C(0, q_2)$). An analogous argument holds when the seller has all the bargaining power (given demand substitutability which implies $R(q_1, q_2) < R(q_1, 0) + R(0, q_2)$). Shaffer (1991) and O’Brien and Shaffer (2005; henceforth: OBS) have shown the latter relationship for the case of demand substitutability and sufficiently large seller bargaining power, but because costs have been assumed to be independent, it has not been shown that buyer power can unfold similar effects because of cost substitutability.In our model we apply the asymmetric Nash bargaining solution which allows us to cover any distribution of bargaining power between the manufacturer and retailer.

Our contribution is, therefore, to show that the sub-optimality of unbundled contracts also holds in the presence of buyer power (which critically depends on cost substitutability, but not on product substitutability). Retailer buyer power has become a focus area of competition policy in recent decades (see, e.g., EC 1999, FTC 2001, 2003, CC 2008). Several competition reports have expressed the concern that powerful buyers are able to extract rents from sellers. Our analysis suggests that imposing unbundling restrictions on vertical contracts can become the source of inefficient bargaining outcomes when retailers have strong bargaining positions.[3]

[3] Recently, the EU has formulated a directive banning unfair trading practices imposed by powerful retailers on suppliers (see EU 2019). It targets —besides other things— de-listing threats of retailers. We can interpret a

In the following, we present the model and repeat the results of OBS concerning bundled/unbundled contracts and demand substitutability. We then present our analysis of buyer power and cost substitutability. The final section concludes. All missing proofs are relegated to the Online Appendix.

2 The Model

An upstream monopolist (manufacturer) produces two imperfectly substitutable products, 1 and 2, to be sold to a downstream firm serving final consumers. We take the downstream firm as a retailer that resells the manufacturer's products to final consumers on a one-to-one basis. We abstract from any retailing costs except the cost of buying the products from the manufacturer. The retailer acts as a monopolist in the final product market.

The manufacturer's production costs $C(q_1, q_2)$ strictly increase in each product's quantity, that is,

$$\frac{\partial C(q_1, q_2)}{\partial q_i} > 0, \text{ for } i = 1, 2 \text{ and all } q_1, q_2 > 0, \tag{1}$$

while we abstract from fixed costs. In addition, the cost function exhibits diseconomies of scope, so that marginal costs of product i increase in the other products quantity; i.e.,

$$\frac{\partial^2 C(q_1, q_2)}{\partial q_1 \partial q_2} > 0 \tag{2}$$

holds for $q_1, q_2 > 0$. Equivalently and in line with Baumol, Panzar, and Willig (1988, Proposition 4B1) we say that costs are *substitutable* if inequality (2) holds. We will show below that this assumption becomes critical in the case of unbundled contracts; it ensures that the manufacturer's incentive constraint to accept both contracts rather than a single one becomes binding when buyer power is sufficiently large. We also consider the converse case of (weak) cost complementarity, with $\frac{\partial^2 C(q_1,q_2)}{\partial q_1 \partial q_2} \leq 0$, for $i = 1, 2$ and all $q_1, q_2 > 0$, which includes OBS's assumption that the products' cost functions are independent of each other. Under weak cost complementarity the manufacturer's incentive constraints never binds.

---

de-listing threat as a retailer commitment either to buy all products of a multi-product supplier or none; i.e., as a bundling device. Constraining such a de-listing threat might unbundle price negotiations with a multi-product supplier.

Cost substitutability applies when both products are produced in a single factory that operates at a high degree of capacity utilization.[4] In the marketing literature it is well acknowledged that product range extension (*brand proliferation*) can be excessive from a pure cost-based perspective.[5] For instance, Bayus and Putsis (1999, p. 138) point out that *"a broad product line will increase the firm's per unit production costs (...) a broad product line may lead to added design costs, additional inventory holding cost, and added complexity in the assembly process (...)."* Similarly, Berman (2011, p. 552) summarizes the cost-disadvantages associated with a large range of products as follows: *"Product proliferation increases a firm's overall costs due to the need for increased production setups; higher ordering costs; increased inventory carrying costs (due to high inventories of component parts, finished goods, and replacement parts); higher warehousing expenses; additional costs associated with item pricing; the increased need for promotional materials, sales personnel, and customer service personnel training; and higher raw and finished material costs (due to ordering small quantities from a multitude of suppliers, including loss of quantity discounts)."*

The game consists of four stages. In the first stage, the manufacturer and the retailer negotiate a contract $T(\cdot, \cdot)$ via Nash bargaining that specifies the price the retailer has to pay for quantities (q_1, q_2). Let $T(0, 0) = 0$. Denote by $\alpha \in [0, 1]$ the manufacturer's and by $1 - \alpha$ the retailer's Nash bargaining weight, respectively. Suppose that the disagreement profits for both parties are zero. In the second stage, the retailer decides how much of each product to buy. In the third stage, the manufacturer decides which of the two products it delivers in the ordered quantities. In the fourth stage the retailer makes its procurement decision and sells the ordered quantities to final consumers and earns revenue $R(q_1, q_2)$.

The third stage does not appear in OBS. It is a natural implication of a retailer's buyer

[4] In cost theory it is common to consider cost complementarity for a cost-based explanation of a natural monopoly. Our assumptions concerning the manufacturer's cost function therefore rule out a cost-based explanation of the manufacturer's bargaining power. Thus, we refer to product differentiation as the main source of the upstream firm's bargaining power.

[5] The product range a brand manufacturer offers is often a longer run decision based on marketing and strategic considerations. For instance, a brand manufacturer may extends its product range because of consumer shopping preferences (Klemperer and Padilla 1997) or umbrella branding advantages (Wernerfeld 1988; Choi 1998).

power. The Nash bargaining specification includes as a limit case the take-it or leave-it contract offer scenario. If the bargaining power is fully on the retailer's side, then the Nash bargaining outcome would be given by the retailer's take-it or leave-it offer. Thus, the third stage is simply acknowledging that the manufacturer can reject the offer by refusing to sell at the posted contract terms. In particular, under unbundling the manufacturer can refuse to deliver one of the products.

Both products are assumed to be substitutable. Product substitutability implies that the marginal revenue of product i decreases in the other product's quantity; formally,

$$\frac{\partial^2 R(q_i, q_j)}{\partial q_i \partial q_j} < 0.$$

holds, where R denotes the overall revenue earned. Note that we need this assumption only to replicate the results by OBS; to derive our new results, only the assumption of cost substitutability is needed.

Joint profits $R(q_1, q_2) - C(q_1, q_2)$ are assumed to be concave and differentiable for all $q_i > 0$ with a unique maximum at (q_1^I, q_2^I) for which $q_1^I, q_2^I > 0$ holds. The solution (q_1^I, q_2^I) is the fully integrated outcome, that is, it maximizes the joint surplus when the manufacturer and the retailers are integrated. Given contract $T(\cdot, \cdot)$ and quantities q_1, q_2, the manufacturer's profit is given by $\pi_m = T(q_1, q_2) - C(q_1, q_2)$ and the retailer's profit by $\pi_r = R(q_1, q_2) - T(q_1, q_2)$, respectively.

Following OBS, a contract $T(q_1, q_2)$ exhibits bundling if and only if $T_1(q_1)$ and $T_2(q_2)$ with $T(q_1, q_2) = T_1(q_1) + T_2(q_2)$ do not exist. In the following, we derive the equilibrium outcomes when bundling is feasible and when it is not. In the latter case, the contract must not exhibit bundling features such as, for example, an aggregate rebate. In the words of OBS, when bundling is not feasible, two additively separable contracts, one for each product, must be specified in the Nash bargaining stage.

3 Equilibrium for Bundling Contracts

We start by reiterating the benchmark analysis provided in OBS. When a bundling contract is feasible, the optimal outcome (q_1^I, q_2^I) is the negotiation outcome under Nash bargaining. Define

$$\mathcal{A} := \{(q_1, q_2, T(\cdot,\cdot)) | (q_1, q_2) \in \arg\max_{\tilde{q}_1, \tilde{q}_2} \{R(\tilde{q}_1, \tilde{q}_2) - T(\tilde{q}_1, \tilde{q}_2)\},\ T(0,0) = 0,\ T(q_1, q_2) \geq C(q_1, q_2)\},$$

so that Nash bargaining solves

$$\max_{(q_1, q_2, T(\cdot,\cdot)) \in \mathcal{A}} \pi_m^\alpha \pi_r^{1-\alpha}, \tag{3}$$

where π_m denotes the manufacturer's and π_r the retailer's profit. OBS (see Lemma 1) prove that, without loss of generality, we can assume that the manufacturer and the retailer bargain over quantity-forcing contracts $T^F(\cdot,\cdot)$ with $T^F(0,0) = 0$, $T^F(q_1', q_2') = F_B$ and $T^F(q_1, q_2) = \infty$, otherwise. Accordingly, $T^F(\cdot,\cdot)$ enforces output levels (q_1', q_2') and gives the supplier a fixed transfer F_B. Quantity-forcing contracts represent a subset of the set of all feasible contracts the manufacturer and the retailer can agree upon and give rise to the same equilibrium outcomes as the set of all contracts. The set of feasible quantity-forcing contracts is given by

$$\mathcal{A}^F = \{(q_1, q_2, F_B, q_1', q_2') | (q_1, q_2) \in \arg\max_q R(q_1, q_2) - T^F(q_1, q_2), F_B \geq C(q_1', q_2')\}.$$

With the restriction to quantity-forcing contracts, the maximization problem (3) becomes

$$\max_{(q_1, q_2, F_B, q_1', q_2') \in \mathcal{A}^F} (T^F(q_1, q_2) - C(q_1, q_2))^\alpha (R(q_1, q_2) - F_B)^{(1-\alpha)}. \tag{4}$$

Assuming (4) has a unique solution, the maximization problems (3) and (4) are equivalent as OBS have shown. Then, in order to solve (3) we have to solve the restricted problem

$$\begin{aligned} &\max_{(q_1, q_2, F_B, q_1', q_2') \in \mathcal{A}^F} (F_B - C(q_1', q_2'))^\alpha (R(q_1, q_2) - F_B)^{(1-\alpha)} \\ &= \max_{q_1, q_2, F_B} (F_B - C(q_1, q_2))^\alpha (R(q_1, q_2) - F_B)^{1-\alpha}, \end{aligned} \tag{5}$$

so that

$$F_B - C(q_1, q_2) \geq 0 \tag{6}$$

and

$$R(q_1, q_2) - F_B \geq 0, \tag{7}$$

where (6) and (7) ensure that the manufacturer and the retailer earn at least their disagreement profits. As by assumption the Nash product satisfies Pareto optimality, in equilibrium the manufacturer and the retailer maximize joint profits and realize the fully integrated outcome (q_1^I, q_2^I), provided (5)-(7) have an interior solution for q_1 and q_2.

Proposition 1 (O'Brien and Shaffer 2005) *Under bundling contracts, the manufacturer and the retailer maximize joint profits.*

4 Equilibrium for Unbundled Contracts

If bundling is not feasible, the manufacturer and the retailer must negotiate a contract that is additively separable in q_1 and q_2, that is, $T(q_1, q_2) = T_1(q_1) + T_2(q_2)$. As before, without loss of generality we assume that the parties bargain over quantity-forcing contracts with $T_i^F(0) = 0$, $T_i^F(q_i') = F_i$, and $T_i^F(q_i) = \infty$ otherwise, for $i = 1, 2$.[6] Suppose that (q_1^{NB}, q_2^{NB}) and (T_1^{NB}, T_2^{NB}) form a bargaining equilibrium if bundling is not feasible. Using quantity-forcing contracts, bilateral negotiation solves the Nash bargaining problem

$$\max_{q_1,q_2,F_1,F_2} (F_1 + F_2 - C(q_1, q_2))^\alpha (R(q_1, q_2) - F_1 - F_2)^{1-\alpha},$$

so that the participation constraints for the manufacturer and the retailer are satisfied; i.e.,

$$F_1 + F_2 - C(q_1, q_2) \geq 0$$

and

$$R(q_1, q_2) - F_1 - F_2 \geq 0$$

hold. In addition, the solution must be such that the manufacturer accepts both contracts

$$F_1 - C(q_1, 0) \leq F_1 + F_2 - C(q_1, q_2), \tag{8}$$

[6] By assuming $T(0) = 0$ we rule out fixed penalties in case one party fails to honor a contract, either the retailer by failing to order or the supplier by refusing to supply a contract. While such a penalty could be used to implement the efficient solution, it would be a rather complex contract clause because it would also make it necessary to specify the party responsible to the no-trade outcome which may not be verifiable and enforceable ex post in court.

$$F_2 - C(0, q_2) \leq F_1 + F_2 - C(q_1, q_2) \tag{9}$$

and such that the retailer accepts both contracts

$$R(q_1, q_2) - F_1 - F_2 \geq \max_{\tilde{q}_2} R(0, \tilde{q}_2) - T_2^F(\tilde{q}_2), \tag{10}$$

$$R(q_1, q_2) - F_1 - F_2 \geq \max_{\tilde{q}_1} R(\tilde{q}_1, 0) - T_1^F(\tilde{q}_1). \tag{11}$$

Note that the manufacturer's participation constraint $F_1 + F_2 - C(q_1, q_2) \geq 0$ holds if the incentive constraints are satisfied.[7] OBS (2005; Lemma 2 and Proposition 3) have shown that if the manufacturer's bargaining position is sufficiently strong (i.e., α is sufficiently large), then the retailer's constraints (10) and (11) must be binding. Given that those constraints bind, the equilibrium quantities are downward distorted (i.e., they are strictly below (q_1^I, q_2^I)). Such an adjustment must be optimal when products are substitutes, in which case the marginal revenue of product i decreases in the output level of the other product.[8] Note that OBS assumed an additively separable cost function, but their proofs do not depend on this assumption, so that their results remain valid in our analysis.

We show, conversely to OBS, that distorted quantities can also be the result of strong buyer power (i.e., α is sufficiently small) when contracts are unbundled. For this to happen, cost substitutability must be present.[9]

For our analysis we distinguish whether in equilibrium both products are provided in strictly positive quantities or not.

[7] To see this, note that summing up the incentive constraints gives $2F_1 + 2F_2 - 2C(q_1, q_2) \geq F_1 + F_2 - C(q_1, 0) - C(0, q_2)$. This implies $F_1 + F_2 - C(q_1, q_2) \geq C(q_1, q_2) - C(q_1, 0) - C(0, q_2) > 0$ which holds by Assumption (2).

[8] While OBS state that their analysis applies to substitutable goods, they do not provide a formal definition. However, in Eq. (25) on page 582 they used this assumption. The equation states that the retailer's marginal revenue from a single product (when the other's quantity is set to zero) is positive, when evaluated at the efficient output level. This is true if we assume that the marginal revenue falls in the other product's output level.

[9] It is worth noting that the manufacturer's incentive constraint (i.e., serving both contracts and not only one under unbundling) can also become binding under (weak) cost complementarity (i.e., when $\frac{\partial^2 C(q_i, q_j)}{\partial q_i \partial q_j} < 0$ holds for all $q_i, q_j > 0$), when we consider product specific fixed costs (see Gorman 1985 where fixed costs are considered in the definition of economies of scope). A necessary condition for this to happen is that the sum of product specific fixed costs is smaller than joint fixed production costs when both products are produced.

Lemma 1 *Suppose in equilibrium both products are provided in strictly positive quantities. Suppose the retailer's incentive constraints* (10) *and* (11) *are slack. Then there exists* $\underline{\alpha} \in (0,1)$ *so that for all* $\alpha < \underline{\alpha}$*, constraints* (8) *and* (9) *bind.*

We can now prove our central Proposition, whereby for strong buyer power unbundled contracts yield inefficiencies.

Proposition 2 *When contracts are unbundled and buyer power is sufficiently strong, i.e.,* $\alpha < \underline{\alpha}$ *holds, either output levels are below* q_1^I*,* q_2^I *or one product is not provided at all.*

Proof: See Online Appendix. □.

The retailer relaxes the manufacturer's incentive constraints by lowering the quantity below the efficient level in order to decrease the manufacturer's marginal production costs, that is, in order to soften the cost-substitutability when all products are produced. In other words, reducing the quantity below that level does not affect joint profits much (it does not have a first-order effect on joint profits) but relaxes the incentive constraint to a relatively large extent. Thus, the manufacturer's incentive constraint is optimally relaxed by distorting production quantities downward.

The following proposition summarizes the results of OBS and ours.

Proposition 3 *Suppose that one of the parties has a sufficiently large bargaining power, that is, if either* $\alpha < \underline{\alpha}$ *or* $\alpha > \overline{\alpha}$ *hold. Suppose both products are provided in equilibrium. Then, both consumer welfare and social welfare are lower under unbundled than under bundled contracts.*

Proof: By OBS and our preceding results, equilibrium quantities are lower than the quantities that maximize joint profits, (q_1^I, q_2^I). Thus, firms' joint profits and consumer surplus are lower than in the bundling equilibrium where (q_1^I, q_2^I) are realized. □.

Thus, if retailers or manufacturers have much bargaining power, equilibrium quantities are insufficient, which implies that both firms' joint profits and consumer surplus are lower than in the bundling equilibrium.

We say that a distortion arises on the retailer's side (manufacturer's side) if a distortion away from efficient output levels is due to the retailer's (manufacturer's) binding incentive constraints.

In our setup (with demand and cost substitutability) the distortion arises both on the retailer's and the manufacturer's side while in OBS (with demand substitutability and independent costs) the distortion occurs only on the retailer's side. It is straightforward to see that if demands are independent and costs are weakly complementary, then no distortion occurs on either side, while with cost substitutability and independent demand the distortion occurs only on the manufacturer's side. Table 1 summarizes these relations.

Table 1: *Distortions depending on the cost and the demand specifications*

	substitutable costs*	**(weakly) complementary costs***
substitutable demand**	*distortion on both sides*	*distortion on retailer's side*
independent demand**	*distortion on manufacturer's side*	*no distortion*

* Substitutable costs means $\partial^2 C(q_1, q_2)/(\partial q_1 \partial q_2) > 0$. (Weakly) complementary costs means $\partial^2 C(q_1, q_2)/(\partial q_1 \partial q_2) \leq 0$.

** Substitutable demand means $\partial^2 R(q_1, q_2)/(\partial q_1 \partial q_2) < 0$. Independent demand means $\partial^2 R(q_1, q_2)/(\partial q_1 \partial q_2) = 0$.

5 Conclusion

We extend the analysis of OBS who show that imposing unbundling restrictions on multi-product negotiations can lead to inefficiencies in the presence of large seller power. We show that a similar reasoning applies to large buyer power and that inefficiencies from unbundling restrictions can then emerge because of cost substitutability. The reason is that large buyer power in association with cost substitutability gives rise to a binding incentive constraint for the manufacturer to accept all contracts and not less. Taking this constraint into account in the Nash bargaining problem then leads to insufficient output levels.

Our analysis is, therefore, also informative for competition policy circles in which remedial solutions to the buyer power issue have been discussed - which range from installing a code of practice (as, for instance, in the UK or recently in the EU in form of unfair trading practices) to a stricter enforcement of (EU treaty) Articles 101 and 102 rules concerning the abuse of buyer market power and vertical restraints, respectively. Similarly, the recently published EU Directive on "Unfair Trading Practices in Business-to-business Relationships in the Agricultural and Food Supply Chain" can be seen as problematic if it constraints powerful buyers' ability to negotiate bundled rebates from multi-product suppliers.

Following OBS, we can extend our analysis by considering N single-product upstreams firms (assuming all products are imperfect substitutes). In this case , the revenue function has to be interpreted as a residual revenue function (given the quantities of the other suppliers). It is then straightforward to show that our analysis and all of our results extend to the case where the downstream retailer bargains with $N + 1$ upstream firms over contracts, where each of the additional N firms offers one product. This directly follows from the fact that the retailer is a monopolist in the downstream market and is thus a common agent from the suppliers' perspective. It then follows that the negative social welfare effects of unbundling under significant buyer power remain valid because rival firms' products are imperfect substitutes; i.e., even though rival firms respond by increasing their quantities this increase does not offset the negative welfare effect of the reduction of the quantities of the multiproduct firm under unbundling (see OBS, p. 583 for a similar conclusion within their framework).

References

Baumol, W.J., Panzar, J.C., and Willig, R.D. (1988), Contestable Markets and the Theory of Industry Structure, Revised Edition, San Diego, Harcourt Brace Jovanovich.

Bayus, B.L. and Putsis, Jr., W.P. (1999) Product Proliferation: An Empirical Analysis of Product Line Determinants and Market Outcomes, Marketing Science 18, 137-153.

Berman, B. (2011), Strategies to Reduce Product Proliferation, Business Horizons 54, 551-561.

CC (2008), The Supply of Groceries in the UK: Market Investigation, UK Competition Commission, London.

Choi, J.P. (1998), Brand Extension as Informational Leverage, Review of Economic Studies 65, 655-669.

EC (1999), Buyer Power and Its Impact on Competition in the Food Retail Distribution Sector of the European Union, DG IV, Brussels.

EC (2005), Commission Decision, Case COMP/A.39.116/B2 - Coca Cola, 22 June 2005, Brussels.

EU (2019), Directive (EU) 2019/633 of the European Parliament and of the Council of 17 April 2019 on Unfair Trading Practices in Business-to-business Relationships in the Agricultural and Food Supply Chain, Official Journal of the European Union L 111/59.

FTC (2001), Report on the Federal Trade Commission Workshop on Slotting Allowances and Other Marketing Practices in the Grocery Industry, Report by the Federal Trade Commission Staff, Washington, D.C.

Gorman, I.E. (1985), Conditions for Economies of Scope in the Presence of Fixed Costs, Rand Journal of Economics 16, 431-436.

Jeon, D.-S. and Menicucci, D. (2012), Bundling and Competition for Slots, American Economic Review 102, 1957-1985.

Klein, B. and Lerner, A.V. (2008), The Law and Economics of Bundled Pricing: LePage's, PeaceHealth, and the Evolving Antitrust Standard, Antitrust Bulletin 53, 555-585.

Klemperer. P. and Padilla, A.J. (1997), Do Firms' Product Lines Include Too Many Varieties?, Rand Journal of Economics 28, 472-488.

Motta, M. (2009), Michelin II: The Treatment of Rebates, pp. 29-49, in: Bruce Lyons (ed.), Cases in European Competition Policy: The Economic Analysis, Cambridge University Press.

Nalebuff, B. (2005), Exclusionary Bundling, Antitrust Bulletin 50(3), 321-370.

O'Brien, D.P. and Shaffer, G. (2005), Bargaining, Bundling, and Clout: The Portfolio Effects of Horizontal Mergers, Rand Journal of Economics 36, 573-595.

Panzar, J.C. and Willig, R.D. (1981), Economies of Scope, American Economic Review Papers and Proceedings 71, 268-272.

Shaffer, G. (1991), Capturing Strategic Rent: Full-Line Forcing, Brand Discounts, Aggregate Rebates, and Maximum Resale Price Maintenance, Journal of Industrial Economics 39, 557-575.

OECD (1998), Buying Power of Multiproduct Retailers, OECD Policy Roundtables, DAFFE/ CLP(99)21, Paris.

Panzar, J.C. and Willig, R.D. (1981), Economies of Scope, American Economic Review Papers and Proceedings 71, 268-272.

Wernerfelt, B. (1988), Umbrella Branding as a Signal of New Product Quality: An Example of Signaling by Posting a Bond, Rand Journal of Economics 19, 458-466.

Wright, J.D. (2006), Antitrust Law and Competition for Distribution, Yale Journal on Regulation 23, 169-208.

Online Appendix

Proof of Lemma 1: We prove by contradiction that one of the manufacturer's constraints has to bind if the retailer's buyer power becomes sufficiently strong. Let the manufacturer's bargaining power α' be non-zero, but sufficiently small so that the retailer's constraint is not binding. By the proof of Lemma 2 in OBS, such an $\alpha' > 0$ exists.

Now suppose that one of the manufacturer's constraints (8) or (9) does not bind. Without loss of generality, assume that constraint (8) on the incentive to manufacture product 2 in addition to product 1 does not bind. Then, the first-order condition of the Nash product with respect to F_2 has to be satisfied: that is,

$$F_1 + F_2 = \alpha R(q_1, q_2) + (1 - \alpha)C(q_1, q_2),$$

so that

$$\lim_{\alpha \to 0} F_1 + F_2 = C(q_1, q_2).$$

The resulting equilibrium quantities q_1, q_2 and transfers F_1, F_2 all depend on α.

Due to our assumption on the cost function, (1), for any small α there is some $\epsilon'(\alpha) > 0$ so that $C(q_1, q_2) > C(q_1, 0) + C(0, q_2) + \epsilon'(\alpha)$ as for any α both equilibrium quantities q_1, q_2 are strictly positive. Let $\epsilon'' := \min_{\alpha \in [0, \alpha']} \epsilon'(\alpha)$. Next, for ϵ'' (which is strictly positive) there is some $\alpha'' \in (0, 1)$ so that for all $\alpha < \alpha''$ we have

$$\epsilon'' > F_1 + F_2 - C(q_1, q_2).$$

From the manufacturer's constraints $F_1 + F_2 - C(q_1, q_2) \geq F_1 - C(q_1, 0)$ and $F_1 + F_2 - C(q_1, q_2) \geq F_2 - C(0, q_2)$, we obtain $F_1 + F_2 \geq 2C(q_1, q_2) - C(q_1, 0) - C(0, q_2)$. Hence, for all $\alpha < \alpha''$ we have

$$\epsilon'' > F_1 + F_2 - C(q_1, q_2) \geq C(q_1, q_2) - C(q_1, 0) - C(0, q_2) > \epsilon'',$$

which is a contradiction. Thus, if α is sufficiently small, the manufacturer's constraints (8) and (9) must bind. □

Proof of Proposition 2: Suppose $\alpha < \underline{\alpha}$. We distinguish two cases depending on whether or not the conditions imposed in Lemma 1 hold.

Case 1. First assume that the conditions imposed for Lemma 1 hold. We show by contradiction that in this case quantities are downward distorted.

(A) Assume that quantities are upward distorted, $q_1 \geq q_1^I$ and $q_2 \geq q_2^I$, where one of the inequalities is strict. Fix F_1 and F_2, but marginally decrease the output quantities in the direction of their efficient levels. This relaxes incentive constraints (8) and (9) due to cost substitutability. Note that q_1 and q_2 cannot be an (interior) solution of the respective maximization problem as this is assumed to be unique at (q_1^I, q_2^I). By Pareto optimality of the Nash bargaining solution, q_1 and q_2 cannot be an equilibrium outcome.

(B) Next suppose that one quantity is up- and one quantity is downward distorted so that without loss of generality $q_1 > q_1^I$ and $q_2 < q_2^I$ holds. Fix F_1 and F_2, but decrease q_1 and slightly increase q_2, so that $C(q_1, 0)$ and $C(q_1, q_2)$ both decrease while $C(q_1, 0)$ decreases by less than $C(q_1, q_2)$. This is possible due to cost substitutability and makes the manufacturer's constraints slack. As in (A), q_1 and q_2 cannot be an (interior) solution of the respective maximization problem as this is assumed to be unique at (q_1^I, q_2^I). By Pareto optimality of the Nash bargaining solution, q_1 and q_2 cannot be an equilibrium outcome.

(C) Third, assume that $q_i < q_i^I$ and $q_j = q_j^I$ where $i \neq j$. A marginal reduction of q_j has only a second-order negative effect, while a marginal increase of q_i has a first-order positive effect on joint profits. A marginal increase of F_i , and a marginal reduction of F_j will give these quantity effects. By Pareto optimality, therefore, $q_i < q_i^I$ and $q_j = q_j^I$ cannot constitute an equilibrium. Analogously, $q_i > q_i^I$ and $q_j = q_j^I$ cannot constitute an equilibrium either.

Case 2. Finally suppose that Lemma 1 does not apply as one or two of the retailer's incentive constraints strictly bind. If (8) and (9) do not bind, then, by OBS, equilibrium quantities are below their efficient levels. If (8) or (9) bind, equilibrium quantities are downward distorted likewise due to Pareto optimality of the Nash product and cost substitutability (arguments are analogous to those in our preceding analysis).

Thus, in equilibrium both quantities are downward distorted under our initial assumption that both products are provided in strictly positive quantities. □

PREVIOUS DISCUSSION PAPERS

329 Dertwinkel-Kalt, Markus and Wey, Christian, Multi-Product Bargaining, Bundling, and Buyer Power, December 2019.
Forthcoming in: Economics Letters.

328 Aghelmaleki, Hedieh, Bachmann, Ronald and Stiebale, Joel, The China Shock, Employment Protection, and European Jobs, December 2019.

327 Link, Thomas, Optimal Timing of Calling In Large-Denomination Banknotes under Natural Rate Uncertainty, November 2019.

326 Heiss, Florian, Hetzenecker, Stephan and Osterhaus, Maximilian, Nonparametric Estimation of the Random Coefficients Model: An Elastic Net Approach, September 2019.

325 Horst, Maximilian and Neyer, Ulrike, The Impact of Quantitative Easing on Bank Loan Supply and Monetary Policy Implementation in the Euro Area, September 2019.

324 Neyer, Ulrike and Stempel, Daniel, Macroeconomic Effects of Gender Discrimination, September 2019.

323 Stiebale, Joel and Szücs, Florian, Mergers and Market Power: Evidence from Rivals' Responses in European Markets, September 2019.

322 Henkel, Marcel, Seidel, Tobias and Suedekum, Jens, Fiscal Transfers in the Spatial Economy, September 2019.

321 Korff, Alex and Steffen, Nico, Economic Preferences and Trade Outcomes, August 2019.

320 Kohler, Wilhelm and Wrona, Jens, Trade in Tasks: Revisiting the Wage and Employment Effects of Offshoring, July 2019.

319 Cobb-Clark, Deborah A., Dahmann, Sarah C., Kamhöfer, Daniel A. and Schildberg-Hörisch, Hannah, Self-Control: Determinants, Life Outcomes and Intergenerational Implications, July 2019.

318 Jeitschko, Thomas D., Withers, John A., Dynamic Regulation Revisited: Signal Dampening, Experimentation and the Ratchet Effect, July 2019.

317 Jeitschko, Thomas D., Kim, Soo Jin and Yankelevich, Aleksandr, Zero-Rating and Vertical Content Foreclosure, July 2019.

316 Kamhöfer, Daniel A. und Westphal, Matthias, Fertility Effects of College Education: Evidence from the German Educational Expansion, July 2019.

315 Bodnar, Olivia, Fremerey, Melinda, Normann, Hans-Theo and Schad, Jannika, The Effects of Private Damage Claims on Cartel Stability: Experimental Evidence, June 2019.

314 Baumann, Florian and Rasch, Alexander, Injunctions Against False Advertising, June 2019.

313 Hunold, Matthias and Muthers, Johannes, Spatial Competition and Price Discrimination with Capacity Constraints, May 2019 (First Version June 2017 under the title “Capacity Constraints, Price Discrimination, Inefficient Competition and Subcontracting”).
Forthcoming in: International Journal of Industrial Organization.

312 Creane, Anthony, Jeitschko, Thomas D. and Sim, Kyoungbo, Welfare Effects of Certification under Latent Adverse Selection, March 2019.

311 Bataille, Marc, Bodnar, Olivia, Alexander Steinmetz and Thorwarth, Susanne, Screening Instruments for Monitoring Market Power – The Return on Withholding Capacity Index (RWC), March 2019.
Published in: Energy Economics, 81 (2019), pp. 227-237.

310 Dertwinkel-Kalt, Markus and Köster, Mats, Salience and Skewness Preferences, March 2019.
Forthcoming in: Journal of the European Economic Association.

309 Hunold, Matthias and Schlütter, Frank, Vertical Financial Interest and Corporate Influence, February 2019.

308 Sabatino, Lorien and Sapi, Geza, Online Privacy and Market Structure: Theory and Evidence, February 2019.

307 Izhak, Olena, Extra Costs of Integrity: Pharmacy Markups and Generic Substitution in Finland, January 2019.

306 Herr, Annika and Normann, Hans-Theo, How Much Priority Bonus Should be Given to Registered Organ Donors? An Experimental Analysis, December 2018.
Published in: Journal of Economic Behavior and Organization, 158 (2019), pp.367-378.

305 Egger, Hartmut and Fischer, Christian, Increasing Resistance to Globalization: The Role of Trade in Tasks, December 2018.

304 Dertwinkel-Kalt, Markus, Köster, Mats and Peiseler, Florian, Attention-Driven Demand for Bonus Contracts, October 2018.
Published in: European Economic Review, 115 (2019), pp.1-24.

303 Bachmann, Ronald and Bechara, Peggy, The Importance of Two-Sided Heterogeneity for the Cyclicality of Labour Market Dynamics, October 2018.
Forthcoming in: The Manchester School.

302 Hunold, Matthias, Hüschelrath, Kai, Laitenberger, Ulrich and Muthers, Johannes, Competition, Collusion and Spatial Sales Patterns – Theory and Evidence, September 2018.

301 Neyer, Ulrike and Sterzel, André, Preferential Treatment of Government Bonds in Liquidity Regulation – Implications for Bank Behaviour and Financial Stability, September 2018.

300 Hunold, Matthias, Kesler, Reinhold and Laitenberger, Ulrich, Hotel Rankings of Online Travel Agents, Channel Pricing and Consumer Protection, September 2018 (First Version February 2017).
Forthcoming in: Marketing Science.

299 Odenkirchen, Johannes, Pricing Behavior in Partial Cartels, September 2018.

298 Mori, Tomoya and Wrona, Jens, Inter-city Trade, September 2018.

297 Rasch, Alexander, Thöne, Miriam and Wenzel, Tobias, Drip Pricing and its Regulation: Experimental Evidence, August 2018.

296 Fourberg, Niklas, Let’s Lock Them in: Collusion under Consumer Switching Costs, August 2018.

295 Peiseler, Florian, Rasch, Alexander and Shekhar, Shiva, Private Information, Price Discrimination, and Collusion, August 2018.

294 Altmann, Steffen, Falk, Armin, Heidhues, Paul, Jayaraman, Rajshri and Teirlinck, Marrit, Defaults and Donations: Evidence from a Field Experiment, July 2018.
Published in: Review of Economics and Statistics, 101 (2019), pp. 808-826.

293 Stiebale, Joel and Vencappa, Dev, Import Competition and Vertical Integration: Evidence from India, July 2018.

292 Bachmann, Ronald, Cim, Merve and Green, Colin, Long-run Patterns of Labour Market Polarisation: Evidence from German Micro Data, May 2018.
Published in: British Journal of Industrial Relations, 57 (2019), pp. 350-376.

291 Chen, Si and Schildberg-Hörisch, Hannah, Looking at the Bright Side: The Motivation Value of Overconfidence, May 2018.
Forthcoming in: European Economic Review.

290 Knauth, Florian and Wrona, Jens, There and Back Again: A Simple Theory of Planned Return Migration, May 2018.

289 Fonseca, Miguel A., Li, Yan and Normann, Hans-Theo, Why Factors Facilitating Collusion May Not Predict Cartel Occurrence – Experimental Evidence, May 2018.
Published in: Southern Economic Journal, 85 (2018), pp. 255-275.

288 Benesch, Christine, Loretz, Simon, Stadelmann, David and Thomas, Tobias, Media Coverage and Immigration Worries: Econometric Evidence, April 2018.
Published in: Journal of Economic Behavior & Organization, 160 (2019), pp. 52-67.

287 Dewenter, Ralf, Linder, Melissa and Thomas, Tobias, Can Media Drive the Electorate? The Impact of Media Coverage on Party Affiliation and Voting Intentions, April 2018.
Published in: European Journal of Political Economy, 58 (2019), pp. 245-261.

286 Jeitschko, Thomas D., Kim, Soo Jin and Yankelevich, Aleksandr, A Cautionary Note on Using Hotelling Models in Platform Markets, April 2018.

285 Baye, Irina, Reiz, Tim and Sapi, Geza, Customer Recognition and Mobile Geo-Targeting, March 2018.

284 Schaefer, Maximilian, Sapi, Geza and Lorincz, Szabolcs, The Effect of Big Data on Recommendation Quality. The Example of Internet Search, March 2018.

283 Fischer, Christian and Normann, Hans-Theo, Collusion and Bargaining in Asymmetric Cournot Duopoly – An Experiment, October 2018 (First Version March 2018).
Published in: European Economic Review, 111 (2019), pp.360-379.

282 Friese, Maria, Heimeshoff, Ulrich and Klein, Gordon, Property Rights and Transaction Costs – The Role of Ownership and Organization in German Public Service Provision, February 2018.

281 Hunold, Matthias and Shekhar, Shiva, Supply Chain Innovations and Partial Ownership, February 2018.

280 Rickert, Dennis, Schain, Jan Philip and Stiebale, Joel, Local Market Structure and Consumer Prices: Evidence from a Retail Merger, January 2018.

279 Dertwinkel-Kalt, Markus and Wenzel, Tobias, Focusing and Framing of Risky Alternatives, December 2017.
Published in: Journal of Economic Behavior & Organization, 159 (2019), pp.289-304.

278 Hunold, Matthias, Kesler, Reinhold, Laitenberger, Ulrich and Schlütter, Frank, Evaluation of Best Price Clauses in Online Hotel Booking, December 2017 (First Version October 2016).
Published in: International Journal of Industrial Organization, 61 (2019), pp. 542-571.

277 Haucap, Justus, Thomas, Tobias and Wohlrabe, Klaus, Publication Performance vs. Influence: On the Questionable Value of Quality Weighted Publication Rankings, December 2017.

276 Haucap, Justus, The Rule of Law and the Emergence of Market Exchange: A New Institutional Economic Perspective, December 2017.
Published in: von Alemann, U., D. Briesen & L. Q. Khanh (eds.), The State of Law: Comparative Perspectives on the Rule of Law, Düsseldorf University Press: Düsseldorf 2017, pp. 143-172.

275 Neyer, Ulrike and Sterzel, André, Capital Requirements for Government Bonds – Implications for Bank Behaviour and Financial Stability, December 2017.

274 Deckers, Thomas, Falk, Armin, Kosse, Fabian, Pinger, Pia and Schildberg-Hörisch, Hannah, Socio-Economic Status and Inequalities in Children's IQ and Economic Preferences, November 2017.
Forthcoming in: Journal of Political Economy.

273 Defever, Fabrice, Fischer, Christian and Suedekum, Jens, Supplier Search and Re-matching in Global Sourcing – Theory and Evidence from China, November 2017.
Published in: Antras, P., W. Kohler and E. Yalcin (eds.), Developments in Global Sourcing, MIT Press: Cambridge (Mass.) 2018, pp. 243-267.

272 Thomas, Tobias, Heß, Moritz and Wagner, Gert G., Reluctant to Reform? A Note on Risk-Loving Politicians and Bureaucrats, October 2017.
Published in: Review of Economics, 68 (2017), pp. 167-179.

271 Caprice, Stéphane and Shekhar, Shiva, Negative Consumer Value and Loss Leading, October 2017.

270 Emch, Eric, Jeitschko, Thomas D. and Zhou, Arthur, What Past U.S. Agency Actions Say About Complexity in Merger Remedies, With an Application to Generic Drug Divestitures, October 2017.
Published in: Competition: The Journal of the Antitrust, UCL and Privacy Section of the California Lawyers Association, 27 (2017/18), pp. 87-104.

269 Goeddeke, Anna, Haucap, Justus, Herr, Annika and Wey, Christian, Flexibility in Wage Setting Under the Threat of Relocation, September 2017.
Published in: Labour: Review of Labour Economics and Industrial Relations, 32 (2018), pp. 1-22.

268 Haucap, Justus, Merger Effects on Innovation: A Rationale for Stricter Merger Control?, September 2017.
Published in: Concurrences: Competition Law Review, 4 (2017), pp.16-21.

267 Brunner, Daniel, Heiss, Florian, Romahn, André and Weiser, Constantin, Reliable Estimation of Random Coefficient Logit Demand Models, September 2017.

266 Kosse, Fabian, Deckers, Thomas, Schildberg-Hörisch, Hannah and Falk, Armin, The Formation of Prosociality: Causal Evidence on the Role of Social Environment, July 2017.
Forthcoming in: Journal of Political Economy.

265 Friehe, Tim and Schildberg-Hörisch, Hannah, Predicting Norm Enforcement: The Individual and Joint Predictive Power of Economic Preferences, Personality, and Self-Control, July 2017.
Published in: European Journal of Law and Economics, 45 (2018), pp. 127-146

264 Friehe, Tim and Schildberg-Hörisch, Hannah, Self-Control and Crime Revisited: Disentangling the Effect of Self-Control on Risk Taking and Antisocial Behavior, July 2017.
Published in: European Journal of Law and Economics, 45 (2018), pp. 127-146.

263 Golsteyn, Bart and Schildberg-Hörisch, Hannah, Challenges in Research on Preferences and Personality Traits: Measurement, Stability, and Inference, July 2017.
Published in: Journal of Economic Psychology, 60 (2017), pp. 1-6.

262 Lange, Mirjam R.J., Tariff Diversity and Competition Policy – Drivers for Broadband Adoption in the European Union, July 2017.
Published in: Journal of Regulatory Economics, 52 (2017), pp. 285-312.

261 Reisinger, Markus and Thomes, Tim Paul, Manufacturer Collusion: Strategic Implications of the Channel Structure, July 2017.
Published in: Journal of Economics & Management Strategy, 26 (2017), pp. 923-954.

260 Shekhar, Shiva and Wey, Christian, Uncertain Merger Synergies, Passive Partial Ownership, and Merger Control, July 2017.

259 Link, Thomas and Neyer, Ulrike, Friction-Induced Interbank Rate Volatility under Alternative Interest Corridor Systems, July 2017.

258 Diermeier, Matthias, Goecke, Henry, Niehues, Judith and Thomas, Tobias, Impact of Inequality-Related Media Coverage on the Concerns of the Citizens, July 2017.

257 Stiebale, Joel and Wößner, Nicole, M&As, Investment and Financing Constraints, July 2017.
Forthcoming in: International Journal of the Economics of Business.

256 Wellmann, Nicolas, OTT-Messaging and Mobile Telecommunication: A Joint Market? – An Empirical Approach, July 2017.
Forthcoming in: Telecommunications Policy under the title "Are OTT Messaging and Mobile Telecommunication an Interrelated Market? An Empirical Analysis".

255 Ciani, Andrea and Imbruno, Michele, Microeconomic Mechanisms Behind Export Spillovers from FDI: Evidence from Bulgaria, June 2017.
Published in: Review of World Economics, 153 (2017), pp. 704-734.

254 Hunold, Matthias and Muthers, Johannes, Spatial Competition with Capacity Constraints and Subcontracting, October 2018 (First Version June 2017 under the title "Capacity Constraints, Price Discrimination, Inefficient Competition and Subcontracting").

253 Dertwinkel-Kalt, Markus and Köster, Mats, Salient Compromises in the Newsvendor Game, June 2017.
Published in: Journal of Economic Behavior & Organization, 141 (2017), pp. 301-315.

252 Siekmann, Manuel, Characteristics, Causes, and Price Effects: Empirical Evidence of Intraday Edgeworth Cycles, May, 2017.

251 Benndorf, Volker, Moellers, Claudia and Normann, Hans-Theo, Experienced vs. Inexperienced Participants in the Lab: Do they Behave Differently?, May 2017.
Published in: Journal of the Economic Science Association, 3 (2017), pp.12-25.

250 Hunold, Matthias, Backward Ownership, Uniform Pricing and Entry Deterrence, May 2017.

249 Kreickemeier, Udo and Wrona, Jens, Industrialisation and the Big Push in a Global Economy, May 2017.

248 Dertwinkel-Kalt, Markus and Köster, Mats, Local Thinking and Skewness Preferences, April 2017.

247 Shekhar, Shiva, Homing Choice and Platform Pricing Strategy, March 2017.

246 Manasakis, Constantine, Mitrokostas, Evangelos and Petrakis, Emmanuel, Strategic Corporate Social Responsibility by a Multinational Firm, March 2017.
Published in: Review of International Economics, 26 (2018), pp. 709-720.

245 Ciani, Andrea, Income Inequality and the Quality of Imports, March 2017.

244 Bonnet, Céline and Schain, Jan Philip, An Empirical Analysis of Mergers: Efficiency Gains and Impact on Consumer Prices, February 2017.

243 Benndorf, Volker and Martinez-Martinez, Ismael, Perturbed Best Response Dynamics in a Hawk-Dove Game, January 2017.
Published in: Economics Letters, 153 (2017), pp. 61-64.

242 Dauth, Wolfgang, Findeisen, Sebastian and Suedekum, Jens, Trade and Manufacturing Jobs in Germany, January 2017.
Published in: American Economic Review, Papers & Proceedings, 107 (2017), pp. 337-342.

Older discussion papers can be found online at:
http://ideas.repec.org/s/zbw/dicedp.html

Heinrich-Heine-University of Düsseldorf

Düsseldorf Institute for
Competition Economics (DICE)

Universitätsstraße 1 _ 40225 Düsseldorf
www.dice.hhu.de

ISSN 2190-9938 (online)
ISBN 978-3-86304-328-5