

Dertwinkel-Kalt, Markus; Haucap, Justus; Wey, Christian

Working Paper

Raising rivals' costs through buyer power

DICE Discussion Paper, No. 162

Provided in Cooperation with:

Düsseldorf Institute for Competition Economics (DICE), Heinrich Heine University Düsseldorf

Suggested Citation: Dertwinkel-Kalt, Markus; Haucap, Justus; Wey, Christian (2014) : Raising rivals' costs through buyer power, DICE Discussion Paper, No. 162, ISBN 978-3-86304-161-8, Heinrich Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Düsseldorf

This Version is available at:

<https://hdl.handle.net/10419/102718>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

DISCUSSION PAPER

No 162

Raising Rivals' Costs Through Buyer Power

Markus Dertwinkel-Kalt,
Justus Haucap,
Christian Wey

October 2014

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

All rights reserved. Düsseldorf, Germany, 2014

ISSN 2190-9938 (online) – ISBN 978-3-86304-161-8

The working papers published in the Series constitute work in progress circulated to stimulate discussion and critical comments. Views expressed represent exclusively the authors' own opinions and do not necessarily reflect those of the editor.

Raising Rivals' Costs Through Buyer Power^{*}

Markus Dertwinkel-Kalt[†] Justus Haucap[‡] Christian Wey[§]

October 2014

Abstract

We re-examine the view that a ban on price discrimination in input markets is particularly desirable in the presence of buyer power. This argument crucially depends on an inverse relationship between downstream firms' profits and the uniform input price. Assuming different input efficiencies among downstream firms, we derive a necessary and sufficient condition such that a higher input price benefits a subset of relatively efficient downstream firms. In such instances, consumers may be better off if discriminatory pricing is feasible.

JEL Classification: L13, D43, K31.

Keywords: Price discrimination, Buyer Power, Raising Rivals' Costs.

^{*}We would like to thank an anonymous referee for very helpful comments. Christian Wey gratefully acknowledges financial support by the German Science Foundation (DFG) for the research project "Competition and Bargaining in Vertical Chains".

[†]Heinrich-Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Universitätsstr. 1, 40225 Düsseldorf, Germany; Email: dertwinkel@dice.hhu.de; Phone: +4917683038485.

[‡]Heinrich-Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE); Email: haucap@dice.hhu.de; Phone: +492118115494 .

[§]Heinrich-Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE); Email: wey@dice.hhu.de; Phone: +492118115499.

1 Introduction

We contribute to the literature that compares different pricing regimes (*discriminatory* vs. *uniform* pricing) in vertical settings, where an upstream monopolist supplies an input to downstream firms which compete in Cournot fashion in the final goods market. In a seminal contribution to the topic Katz (1987) has shown that price discrimination can raise the price to all buyers when they are Cournot competitors in the downstream market. In that setting downstream firms are assumed to be symmetric except that one of the buyers (the “dominant” firm) has a better outside option than rivals.¹

Katz’s result can be described for the two-firms case as follows. Suppose that the dominant firm’s outside option is a binding constraint both when discrimination is forbidden and when it is allowed. Under discriminatory pricing, the dominant firm obtains a relatively low input price because of its outside option. In equilibrium it is indifferent between purchasing from the supplier and using the outside option. If, however, price discrimination is banned, typically the monopolist adjusts by lowering the price for the rival firm, but raising the price for the dominant firm. But this is not optimal in the presence of buyer power since a price reduction to the rival firm reduces the dominant firm’s profit. Therefore, a price reduction to the rival firm must be accompanied by a reduction in the price charged from the dominant firm to prevent it from turning to its outside option. This reasoning gives rise to a new (low-uniform price) equilibrium if the own profit effect dominates the cross profit effects; that is, if an increase in the dominant firm’s input price affects its profit by more (in absolute value) than an increase in the rival’s wholesale price. Then, raising the dominant firm’s price toward the rival’s price in order to satisfy the non-discrimination constraint will not work if the seller wishes to continue selling to the dominant firm. Thus, the monopolist must lower the uniform input price for both firms. Since both prices fall, a non-discrimination rule reduces the final

¹See Inderst and Valetti (2009) for a generalization of Katz (1987) and O’Brien (2014) for a qualification of Katz’s result. The latter work is complementary to our undertaking. It shows that the dominant firm’s source of bargaining power is critical for the Katz result to hold.

good price and increases consumer surplus.

Our point is that this reasoning is not valid anymore when downstream firms are asymmetric; in particular, when firms differ in their productivity levels with regard to the use of the input. In such a setting, cross profit effects might dominate own profit effects such that the dominant firm's profit is increasing rather than decreasing in a common wholesale price. If this is the case, then a downstream firm's buyer power unfolds upward pressure on the uniform input price as an input price increase raises the marginal cost of the rival by more than it raises the marginal cost of the dominant firm. If differences in input efficiencies are sufficiently pronounced, then a relatively efficient downstream firm benefits from a high uniform input price because of a raising rivals' costs effect (see Williamson, 1968). Here, the seller's optimal response to a non-discrimination constraint is to raise rather than lower the price it charges the dominant firm. Therefore, we reverse Katz (1987) by establishing that in the presence of buyer power consumers may be better off if discriminatory pricing is feasible.

In Section 2, we introduce the model. We provide an example in Section 3 and prove its generality in Section 4. Finally, Section 5 concludes.

2 The Model

We consider an upstream monopolist producing an input good which it sells to n downstream firms (indexed by $i \in I = \{1, \dots, n\}$) at price w_i . Under discriminatory pricing (indexed by “ D ”) the upstream monopolist can charge different prices from downstream firms. When discriminatory pricing is banned (indexed by “ U ”), the monopolist must charge a uniform input price from all downstream firms. We consider a two-stage game, where the upstream firm first sets either discriminatory prices (regime D) or a uniform price (regime U). In the second stage, downstream firms compete in the final goods market à la Cournot.

Let q_i denote firm i 's output of the homogenous final good. The inverse demand function $P(Q)$ is downward sloping, $P'(Q) < 0$, where $Q := \sum_i q_i$. Firm i 's cost function

is given by $C_i(q_i, w_i) = \alpha_i w_i q_i + \beta_i q_i$, for $i = 1, \dots, n$, where $\alpha_i \geq 0$ measures the input efficiency of firm i (“ α -efficiency”) and $\beta_i \geq 0$ represents additional marginal production costs of firm i (“ β -efficiency”).² Firm i ’s profit function is then given by $\Pi_i = P(Q)q_i - \alpha_i w_i q_i - \beta_i q_i$.

Downstream firm $k \in I$ has buyer power through an outside option which gives rise to a profit level of V^0 .³ We assume that this outside option is binding and effectively constraints the upstream monopolist’s maximization problem which is given by⁴

$$\begin{aligned} \max_{w_1, \dots, w_n \geq 0} L &= \sum_{i=1}^n \alpha_i q_i w_i \\ \text{subject to } \Pi_k(q_k, Q_{-k}) &\geq V^0, \end{aligned}$$

where $Q_{-k} := \sum_{j=1, j \neq k}^n q_j$. If price discrimination is banned, then the monopolist’s problem is additionally constrained by the requirement $w_1 = \dots = w_n$.

We assume that each firms’ reaction function slopes downward with slope between -1 and 0 , which follows from⁵

$$P''(Q)q_i + P'(Q) < 0 \text{ for } i = 1, \dots, n. \quad (1)$$

²Yoshida (2000) established the distinction between α - and β -efficiencies. Whereas the assumption of symmetric α -efficiencies may be plausible with respect to storable retailing and durable goods, there are many conceivable instances where downstream firms differ in their α -efficiencies. In the case of unionized labor, firms may differ in their labor productivities such that (presumably, more capital-intense) firms can use their labor force more efficiently than others. Or, in the case of raw materials, some firms may produce less waste and thus use their inputs more efficiently in the production process of the final good. In the case of tradable emission rights for carbon dioxide, firms typically differ in their emission levels that are necessary to produce a given quantity of electricity, steel, or cement, to name just a few examples. Even with respect to retailing and perishable goods certain retailers may be more efficient while others generate more spoiled goods.

³See Dertwinkel-Kalt et al. (2014) for an example with an endogenous outside option, where a firm can integrate backward as in Katz (1987).

⁴We assume throughout our analysis that the upstream monopolist finds it optimal to sell to all downstream firms. Hence, in equilibrium all downstream firm are active and procure the input from the monopolist. This assumption is also critical in Katz (1987) and Yoshida (2000).

⁵This inequality holds if the industry demand curve satisfies $P''(Q)Q + P'(Q) < 0$.

We first present an example to show that buyer power can make discriminatory pricing more attractive than uniform pricing from a consumer surplus perspective. In a second step we show the generality of our result.

3 Example

We show by example that in the presence of buyer power (i.e., a dominant downstream firm has an outside option) consumers can be made better off under discriminatory than under non-discriminatory pricing. Let $P = 1 - Q$, $n = 2$, $\beta_1 = \beta_2 = 0$, $\alpha_1 = 1$ and $\alpha_2 = 3$ and let the upstream supplier produce at cost zero. Solving downstream firms' first-order conditions we obtain firms' optimal outputs $q_1(w_1, w_2) = 1/3 - 2w_1/3 + w_2$ and $q_2(w_1, w_2) = 1/3 + w_1/3 - 2w_2$. If the input price is uniform, then $q_1(w) = (1 + w)/3$ and $q_2(w) = (1 - 5w)/3$. Given those derived demands, we examine the optimal price setting of the input supplier.

We first analyze the price discriminatory regime. The upstream manufacturer solves

$$\max_{w_1, w_2 \geq 0} (\alpha_1 w_1 q_1(w_1, w_2) + \alpha_2 w_2 q_2(w_1, w_2)).$$

This gives rise to the first-order conditions

$$\alpha_i q_i + \alpha_i w_i \frac{dq_i}{dw_i} = 0, \text{ for } i = 1, 2,$$

which yield the equilibrium input prices $w_1^D = 1/2$ and $w_2^D = 1/6$.

Second, we solve the manufacturer's maximization problem under uniform pricing. The upstream firm solves $\max_{w \geq 0} w(q_1(w) + q_2(w))$, which yields the first-order condition

$$Q + w \left(\frac{dq_1}{dw} + \frac{dq_2}{dw} \right) = 0.$$

This gives the optimal uniform input price $w^U = 1/7$. Firm 1 earns under the price-discriminatory regime $\pi_1^D = 1/36 \approx 0.028$, while it realizes $\pi_1^U = 64/441 \approx 0.145$ under the uniform pricing regime. It is easily checked that consumers strictly favor uniform pricing.

Now we introduce an outside option for firm 1 which provides profit level V^0 . Assume that the outside option binds under both regimes.⁶ We show that the profit of the relatively efficient firm increases over some range in the common wholesale price, such that under uniform pricing the input price will rise in firm 1's outside option. Under the discriminatory regime, w_1 is decreasing in V^0 and w_2 is independent of V^0 . Solving for the optimal input prices (provided that V^0 binds) gives $w_1^D = 3/4 - 3\sqrt{V^0}/2$ and $w_2^D = 1/6$ and under uniform pricing $w^U = w_1^U = w_2^U = 3\sqrt{V^0} - 1$. Defining the sum of firm's marginal costs as $MC := \sum_i \alpha_i w_i + \beta_i = \alpha_1 w_1 + \alpha_2 w_2$, we obtain $MC^D = 5/4 - 3\sqrt{V^0}/2$ and $MC^U = 12\sqrt{V^0} - 4$, so that

$$MC^D < MC^U \text{ if and only if } V^0 > \frac{49}{324} \approx 0.151 > \pi_1^U.$$

Note that consumer surplus is monotonically increasing in the overall quantity Q , while Q is monotonically decreasing in the sum of firms' marginal costs. It follows that, if firm 1's outside option is sufficiently attractive, final consumers benefit from input price discrimination. Instead, uniform pricing induces firm 1 to use its buyer power to establish higher input prices, which leads to a reduction in consumer surplus.

4 General Analysis

We investigate the previous example in a more general setup and derive conditions on the downstream firm's input efficiencies for which the result by Katz (1987) is reversed; i.e., where consumers favor a discriminatory pricing regime. The key element of our general analysis is to specify a necessary and sufficient condition for firm k 's profit to increase with a rise in the uniform input price. Firm k 's profit increases in the uniform input price

⁶This is of course a simplification which allows us to abstract from a full specification of subgames which would follow if firm 1 reverts to its outside option. In general, the outside option may be binding only in one regime and the upstream monopolist may want to supply only firm 2 instead of meeting firm 1's outside option (see Dertwinkel-Kalt et al., 2014, for such an analysis).

w if and only if

$$\frac{d\Pi_k(q_k, Q_{-k})}{dw} = \frac{\partial\Pi_k}{\partial w} + \frac{\partial\Pi_k}{\partial q_k} \frac{dq_k}{dw} + \frac{\partial\Pi_k}{\partial Q_{-k}} \frac{dQ_{-k}}{dw} > 0 \quad (2)$$

holds, where $\frac{\partial\Pi_k}{\partial w} = -\alpha_k q_k$, $\frac{\partial\Pi_k}{\partial q_k} \frac{dq_k}{dw} = 0$ (envelope theorem), and $\frac{\partial\Pi_k}{\partial Q_{-k}} \frac{dQ_{-k}}{dw} = P' q_k \frac{dQ_{-k}}{dw}$.

Thus, (2) is equivalent to

$$q_k \left(-\alpha_k + P' \frac{dQ_{-k}}{dw} \right) > 0. \quad (3)$$

In a Cournot-Nash equilibrium, all firms' first-order conditions are fulfilled; i.e.,

$$\Pi'_i = P' q_i + P - \alpha_i w - \beta_i = 0, \text{ for all } i \in I. \quad (4)$$

Summing over all $i \in I \setminus \{k\}$ first-order conditions yields

$$P' Q_{-k} + (n-1)P - \sum_{i \neq k} (\alpha_i w + \beta_i) = 0. \quad (5)$$

Note that in equilibrium the total output Q is inversely proportional to the sum of firms' marginal production costs $MC := \sum_{i=1}^n \alpha_i w_i + \beta_i$. Taking the total derivative of (5) with respect to w , q_k and Q_{-k} gives

$$(P'' Q_{-k} + nP') dQ_{-k} + (P'' Q_{-k} + (n-1)P') dq_k - \left(\sum_{i \neq k} \alpha_i \right) dw = 0,$$

which is equivalent to

$$\frac{dQ_{-k}}{dw} = \frac{\sum_{i \neq k} \alpha_i - (P'' Q_{-k} + (n-1)P') dq_k / dw}{P'' Q_{-k} + nP'}. \quad (6)$$

Accordingly, taking the total derivative of firm k 's first-order condition and re-arranging, we obtain

$$\frac{dq_k}{dw} = \frac{\alpha_k - (P'' q_k + P') dQ_{-k} / dw}{P'' q_k + 2P'}. \quad (7)$$

Substituting (7) into (6) and plugging this into (3), we obtain the following condition which ensures that firm k 's profit depends positively on the uniform input price:

$$\frac{a_k}{\sum_{i \neq k} \alpha_i} < \frac{2P' + P'' q_k}{2nP' + P''(q_k + 2Q_{-k})}. \quad (8)$$

If firms are sufficiently asymmetric with regard to their α -efficiencies, then there is always some firm j for which $\alpha_j / \sum_{i \neq j} \alpha_i \geq 1/(n-1)$ holds, while the right-hand side of (8) is

strictly smaller than $1/(n-1)$.⁷ Thus, condition (2) implies that $d\Pi_i(q_i, Q_{-i})/dw < 0$ holds for some $i \in I$. Consequently, if firm k 's profit is increasing in the uniform input price, then there is at least one other firm i for which the profit decreases in w . In particular, firms which produce with an α -efficiency below the market's average can never benefit from input price increases. Interestingly, in order for condition (2) to hold, it is not important how many firms are more or less efficient than firm k , but only the relation to firms' average efficiency in the market is critical. It is noteworthy that only α -efficiencies play a role since they can, in contrast to β -efficiencies, result in overproportional disadvantages for rival downstream firms. An increase in the input price can, therefore, benefit a firm only if other firms are harmed overproportionally so that a *raising rival's cost* effect exists.

Lemma 1. *Firm k 's profit is increasing in the uniform input price w if and only if condition (8) holds which depends on downstream firms' α -efficiencies but not on their β -efficiencies. For the linear demand case, with $P'' = 0$, this condition reduces to*

$$\frac{a_k}{\sum_{i \neq k} \alpha_i} < \frac{1}{n}.$$

Next, we compare the discriminatory and the non-discriminatory pricing regimes. We show that consumer surplus can be lower under non-discriminatory pricing. Suppose an equilibrium under discriminatory pricing (w_1^D, \dots, w_n^D) . Suppose also that in this equilibrium the dominant firm's outside option is binding. This equilibrium gives rise to a certain consumer surplus level which is inversely related to the sum of firms' marginal costs. We can next calculate the uniform input price, \bar{w} , which gives rise to the same sum of firms' marginal costs (and hence the same consumer surplus level) as under the discriminatory prices (w_1^D, \dots, w_n^D) . This "consumer-surplus fixing" price is given by $\bar{w} =: \sum_i \alpha_i w_i^D / \sum_i \alpha_i$. Assume that the dominant firm's profit level is smaller under the uniform input price \bar{w} than under the discriminatory pricing equilibrium. Hence, the dominant firm's outside option is better in this case, but suppose that the resulting gap

⁷It is obvious that it is below $1/(n-1)$ if $P'' \leq 0$. If $P'' > 0$, then condition (1) implies $2nP' + P''(q_k + 2Q_{-k}) = 2(n-1)P' + P''q_k + 2(P' + P''Q_{-k}) < 2(n-1)P' + P''q_k$ so that the right hand side of condition (8) is below $1/(n-1)$.

is not too large. Given that condition (8) holds, it then follows that the upstream monopolist must *increase* the uniform input price above \bar{w} to induce the dominant firm to accept the offer. The following proposition summarizes this reasoning.

Proposition 1. *Let (w_1^D, \dots, w_n^D) be the vector of input prices in the discriminatory equilibrium in which the dominant firm's outside option binds. Let \bar{w} be the uniform input price which gives rise to the same consumer surplus as under the discriminatory equilibrium. Assume that the dominant firm's profit level is smaller under the uniform input price \bar{w} than in the discriminatory equilibrium. If the dominant firm's outside option can be made profitably binding and if condition (8) holds, then the equilibrium uniform input price fulfills $w^U > \bar{w}$. In that case, consumer surplus is strictly lower under uniform pricing when compared with discriminatory pricing.*

Proposition 1 reverses the result by Katz (1987) that price discrimination bans are desirable from a consumer's perspective in the presence of buyer power. In Katz's model the dominant firm's binding outside option unfolds downward pressure on the uniform input price, which leads to a lower final good price and an increase in consumer surplus. This relationship follows from the assumption that firm i 's marginal cost function is given by $w + \beta_i$, so that firms are allowed to differ only with respect to their β -efficiency, but not with respect to their α -efficiency.

5 Conclusion

We have provided a rationale why the exercise of buyer power of downstream firms vis-à-vis an input supplier may result in an overall higher input price under uniform pricing, which reduces consumer surplus. Based on this, we have argued why price discrimination of a monopoly supplier may benefit consumers in the presence of downstream buyer power. A relatively efficient downstream firm may benefit from a higher uniform input price because of a raising rivals' costs effect where rival firms' are harmed overproportionally from an input price increase. This, however, can only happen if firms are sufficiently asymmetric

with regard to their input efficiencies.

References

- Dertwinkel-Kalt, M., Haucap, J., and Wey, C. (2014), Entry Facilitating Price Discrimination, Mimeo (available online at SSRN).
- Inderst, R. and Valletti, T. (2009), Price Discrimination in Input Markets, *Rand Journal of Economics* 40, 1-19.
- Katz, M. (1987), The Welfare Effects of Third-Degree Price Discrimination in Intermediate Goods Markets, *American Economic Review* 77, 154-167.
- O'Brien, D.P.O. (2014), The Welfare Effects of Third-Degree Price Discrimination in Intermediate Good Markets: The Case of Bargaining, *Rand Journal of Economics* 45, 92-115.
- Williamson, O.E. (1968), Wage Rates as a Barrier to Entry: The Pennington Case in Perspective, *Quarterly Journal of Economics* 82, 85-116.
- Yoshida, Y. (2000). Third-Degree Price Discrimination in Input Markets: Output and Welfare, *American Economic Review* 90, 240-246.

PREVIOUS DISCUSSION PAPERS

- 162 Dertwinkel-Kalt, Markus, Haucap, Justus and Wey, Christian, Raising Rivals' Costs Through Buyer Power, October 2014.
- 161 Dertwinkel-Kalt, Markus and Köhler, Katrin, Exchange Asymmetries for Bads? Experimental Evidence, October 2014.
- 160 Behrens, Kristian, Mion, Giordano, Murata, Yasusada and Suedekum, Jens, Spatial Frictions, September 2014.
- 159 Fonseca, Miguel A. and Normann, Hans-Theo, Endogenous Cartel Formation: Experimental Evidence, August 2014.
Forthcoming in: Economics Letters.
- 158 Stiebale, Joel, Cross-Border M&As and Innovative Activity of Acquiring and Target Firms, August 2014.
- 157 Haucap, Justus and Heimeshoff, Ulrich, The Happiness of Economists: Estimating the Causal Effect of Studying Economics on Subjective Well-Being, August 2014.
Forthcoming in: International Review of Economics Education.
- 156 Haucap, Justus, Heimeshoff, Ulrich and Lange, Mirjam R. J., The Impact of Tariff Diversity on Broadband Diffusion – An Empirical Analysis, August 2014.
- 155 Baumann, Florian and Friehe, Tim, On Discovery, Restricting Lawyers, and the Settlement Rate, August 2014.
- 154 Hottenrott, Hanna and Lopes-Bento, Cindy, R&D Partnerships and Innovation Performance: Can There be too Much of a Good Thing?, July 2014.
- 153 Hottenrott, Hanna and Lawson, Cornelia, Flying the Nest: How the Home Department Shapes Researchers' Career Paths, July 2014.
- 152 Hottenrott, Hanna, Lopes-Bento, Cindy and Veugelers, Reinhilde, Direct and Cross-Scheme Effects in a Research and Development Subsidy Program, July 2014.
- 151 Dewenter, Ralf and Heimeshoff, Ulrich, Do Expert Reviews Really Drive Demand? Evidence from a German Car Magazine, July 2014.
- 150 Bataille, Marc, Steinmetz, Alexander and Thorwarth, Susanne, Screening Instruments for Monitoring Market Power in Wholesale Electricity Markets – Lessons from Applications in Germany, July 2014.
Published in: Economics Letters, 125 (2014), pp.223-225.
- 149 Kholodilin, Konstantin A., Thomas, Tobias and Ulbricht, Dirk, Do Media Data Help to Predict German Industrial Production?, July 2014.
- 148 Hogrefe, Jan and Wrona, Jens, Trade, Tasks, and Trading: The Effect of Offshoring on Individual Skill Upgrading, June 2014.
- 147 Gaudin, Germain and White, Alexander, On the Antitrust Economics of the Electronic Books Industry, May 2014.
- 146 Alipranti, Maria, Milliou, Chrysovalantou and Petrakis, Emmanuel, Price vs. Quantity Competition in a Vertically Related Market, May 2014.
Published in: Economics Letters, 124 (2014), pp.122-126.

- 145 Blanco, Mariana, Engelmann, Dirk, Koch, Alexander K., and Normann, Hans-Theo, Preferences and Beliefs in a Sequential Social Dilemma: A Within-Subjects Analysis, May 2014.
Published in: Games and Economic Behavior, 87 (2014), pp.122-135.
- 144 Jeitschko, Thomas D., Jung, Yeonjei and Kim, Jaesoo, Bundling and Joint Marketing by Rival Firms, May 2014.
- 143 Benndorf, Volker and Normann, Hans-Theo, The Willingness to Sell Personal Data, April 2014.
- 142 Dauth, Wolfgang and Suedekum, Jens, Globalization and Local Profiles of Economic Growth and Industrial Change, April 2014.
- 141 Nowak, Verena, Schwarz, Christian and Suedekum, Jens, Asymmetric Spiders: Supplier Heterogeneity and the Organization of Firms, April 2014.
- 140 Hasnas, Irina, A Note on Consumer Flexibility, Data Quality and Collusion, April 2014.
- 139 Baye, Irina and Hasnas, Irina, Consumer Flexibility, Data Quality and Location Choice, April 2014.
- 138 Aghadadashli, Hamid and Wey, Christian, Multi-Union Bargaining: Tariff Plurality and Tariff Competition, April 2014.
- 137 Duso, Tomaso, Herr, Annika and Suppliet, Moritz, The Welfare Impact of Parallel Imports: A Structural Approach Applied to the German Market for Oral Anti-diabetics, April 2014.
Published in: Health Economics, 23 (2014), pp. 1036-1057.
- 136 Haucap, Justus and Müller, Andrea, Why are Economists so Different? Nature, Nurture and Gender Effects in a Simple Trust Game, March 2014.
- 135 Normann, Hans-Theo and Rau, Holger A., Simultaneous and Sequential Contributions to Step-Level Public Goods: One vs. Two Provision Levels, March 2014.
Forthcoming in: Journal of Conflict Resolution.
- 134 Bucher, Monika, Hauck, Achim and Neyer, Ulrike, Frictions in the Interbank Market and Uncertain Liquidity Needs: Implications for Monetary Policy Implementation, July 2014 (First Version March 2014).
- 133 Czarnitzki, Dirk, Hall, Bronwyn, H. and Hottenrott, Hanna, Patents as Quality Signals? The Implications for Financing Constraints on R&D?, February 2014.
- 132 Dewenter, Ralf and Heimeshoff, Ulrich, Media Bias and Advertising: Evidence from a German Car Magazine, February 2014.
Published in: Review of Economics, 65 (2014), pp. 77-94.
- 131 Baye, Irina and Sapi, Geza, Targeted Pricing, Consumer Myopia and Investment in Customer-Tracking Technology, February 2014.
- 130 Clemens, Georg and Rau, Holger A., Do Leniency Policies Facilitate Collusion? Experimental Evidence, January 2014.
- 129 Hottenrott, Hanna and Lawson, Cornelia, Fishing for Complementarities: Competitive Research Funding and Research Productivity, December 2013.
- 128 Hottenrott, Hanna and Rexhäuser, Sascha, Policy-Induced Environmental Technology and Inventive Efforts: Is There a Crowding Out?, December 2013.

- 127 Dauth, Wolfgang, Findeisen, Sebastian and Suedekum, Jens, The Rise of the East and the Far East: German Labor Markets and Trade Integration, December 2013. Forthcoming in: Journal of European Economic Association.
- 126 Wenzel, Tobias, Consumer Myopia, Competition and the Incentives to Unshroud Add-on Information, December 2013. Published in: Journal of Economic Behavior and Organization, 98 (2014), pp. 89-96.
- 125 Schwarz, Christian and Suedekum, Jens, Global Sourcing of Complex Production Processes, December 2013. Published in: Journal of International Economics, 93 (2014), pp. 123-139.
- 124 Defever, Fabrice and Suedekum, Jens, Financial Liberalization and the Relationship-Specificity of Exports, December 2013. Published in: Economics Letters, 122 (2014), pp. 375-379.
- 123 Bauernschuster, Stefan, Falck, Oliver, Heblich, Stephan and Suedekum, Jens, Why Are Educated and Risk-Loving Persons More Mobile Across Regions?, December 2013. Published in: Journal of Economic Behavior and Organization, 98 (2014), pp. 56-69.
- 122 Hottenrott, Hanna and Lopes-Bento, Cindy, Quantity or Quality? Knowledge Alliances and their Effects on Patenting, December 2013. Forthcoming in: Industrial and Corporate Change.
- 121 Hottenrott, Hanna and Lopes-Bento, Cindy, (International) R&D Collaboration and SMEs: The Effectiveness of Targeted Public R&D Support Schemes, December 2013. Published in: Research Policy, 43 (2014), pp.1055-1066.
- 120 Giesen, Kristian and Suedekum, Jens, City Age and City Size, November 2013. Published in: European Economic Review, 71 (2014), pp. 193-208.
- 119 Trax, Michaela, Brunow, Stephan and Suedekum, Jens, Cultural Diversity and Plant-Level Productivity, November 2013.
- 118 Manasakis, Constantine and Vlassis, Minas, Downstream Mode of Competition With Upstream Market Power, November 2013. Published in: Research in Economics, 68 (2014), pp. 84-93.
- 117 Sapi, Geza and Suleymanova, Irina, Consumer Flexibility, Data Quality and Targeted Pricing, November 2013.
- 116 Hinloopen, Jeroen, Müller, Wieland and Normann, Hans-Theo, Output Commitment Through Product Bundling: Experimental Evidence, November 2013. Published in: European Economic Review, 65 (2014), pp. 164-180.
- 115 Baumann, Florian, Denter, Philipp and Friehe Tim, Hide or Show? Endogenous Observability of Private Precautions Against Crime When Property Value is Private Information, November 2013.
- 114 Fan, Ying, Kühn, Kai-Uwe and Lafontaine, Francine, Financial Constraints and Moral Hazard: The Case of Franchising, November 2013.
- 113 Aguzzoni, Luca, Argentesi, Elena, Buccirosi, Paolo, Ciari, Lorenzo, Duso, Tomaso, Tognoni, Massimo and Vitale, Cristiana, They Played the Merger Game: A Retrospective Analysis in the UK Videogames Market, October 2013. Forthcoming in: Journal of Competition Law and Economics under the title: "A Retrospective Merger Analysis in the UK Videogame Market".

- 112 Myrseth, Kristian Ove R., Riener, Gerhard and Wollbrant, Conny, Tangible Temptation in the Social Dilemma: Cash, Cooperation, and Self-Control, October 2013.
- 111 Hasnas, Irina, Lambertini, Luca and Palestini, Arsen, Open Innovation in a Dynamic Cournot Duopoly, October 2013.
Published in: *Economic Modelling*, 36 (2014), pp. 79-87.
- 110 Baumann, Florian and Friehe, Tim, Competitive Pressure and Corporate Crime, September 2013.
- 109 Böckers, Veit, Haucap, Justus and Heimeshoff, Ulrich, Benefits of an Integrated European Electricity Market, September 2013.
- 108 Normann, Hans-Theo and Tan, Elaine S., Effects of Different Cartel Policies: Evidence from the German Power-Cable Industry, September 2013.
Published in: *Industrial and Corporate Change*, 23 (2014), pp.1037-1057.
- 107 Haucap, Justus, Heimeshoff, Ulrich, Klein, Gordon J., Rickert, Dennis and Wey, Christian, Bargaining Power in Manufacturer-Retailer Relationships, September 2013.
- 106 Baumann, Florian and Friehe, Tim, Design Standards and Technology Adoption: Welfare Effects of Increasing Environmental Fines when the Number of Firms is Endogenous, September 2013.
- 105 Jeitschko, Thomas D., NYSE Changing Hands: Antitrust and Attempted Acquisitions of an Erstwhile Monopoly, August 2013.
Published in: *Journal of Stock and Forex Trading*, 2 (2) (2013), pp. 1-6.
- 104 Böckers, Veit, Giessing, Leonie and Rösch, Jürgen, The Green Game Changer: An Empirical Assessment of the Effects of Wind and Solar Power on the Merit Order, August 2013.
- 103 Haucap, Justus and Muck, Johannes, What Drives the Relevance and Reputation of Economics Journals? An Update from a Survey among Economists, August 2013.
- 102 Jovanovic, Dragan and Wey, Christian, Passive Partial Ownership, Sneaky Takeovers, and Merger Control, August 2013.
Published in: *Economics Letters*, 125 (2014), pp. 32-35.
- 101 Haucap, Justus, Heimeshoff, Ulrich, Klein, Gordon J., Rickert, Dennis and Wey, Christian, Inter-Format Competition Among Retailers – The Role of Private Label Products in Market Delineation, August 2013.
- 100 Normann, Hans-Theo, Requate, Till and Waichman, Israel, Do Short-Term Laboratory Experiments Provide Valid Descriptions of Long-Term Economic Interactions? A Study of Cournot Markets, July 2013.
Published in: *Experimental Economics*, 17 (2014), pp. 371-390.
- 99 Dertwinkel-Kalt, Markus, Haucap, Justus and Wey, Christian, Input Price Discrimination (Bans), Entry and Welfare, June 2013.
- 98 Aguzzoni, Luca, Argentesi, Elena, Ciari, Lorenzo, Duso, Tomaso and Tognoni, Massimo, Ex-post Merger Evaluation in the UK Retail Market for Books, June 2013.
- 97 Caprice, Stéphane and von Schlippenbach, Vanessa, One-Stop Shopping as a Cause of Slotting Fees: A Rent-Shifting Mechanism, May 2012.
Published in: *Journal of Economics and Management Strategy*, 22 (2013), pp. 468-487.

- 96 Wenzel, Tobias, Independent Service Operators in ATM Markets, June 2013.
Published in: Scottish Journal of Political Economy, 61 (2014), pp. 26-47.
- 95 Coublucq, Daniel, Econometric Analysis of Productivity with Measurement Error: Empirical Application to the US Railroad Industry, June 2013.
- 94 Coublucq, Daniel, Demand Estimation with Selection Bias: A Dynamic Game Approach with an Application to the US Railroad Industry, June 2013.
- 93 Baumann, Florian and Friehe, Tim, Status Concerns as a Motive for Crime?, April 2013.
- 92 Jeitschko, Thomas D. and Zhang, Nanyun, Adverse Effects of Patent Pooling on Product Development and Commercialization, April 2013.
Published in: The B. E. Journal of Theoretical Economics, 14 (1) (2014), Art. No. 2013-0038.
- 91 Baumann, Florian and Friehe, Tim, Private Protection Against Crime when Property Value is Private Information, April 2013.
Published in: International Review of Law and Economics, 35 (2013), pp. 73-79.
- 90 Baumann, Florian and Friehe, Tim, Cheap Talk About the Detection Probability, April 2013.
Published in: International Game Theory Review, 15 (2013), Art. No. 1350003.
- 89 Pagel, Beatrice and Wey, Christian, How to Counter Union Power? Equilibrium Mergers in International Oligopoly, April 2013.
- 88 Jovanovic, Dragan, Mergers, Managerial Incentives, and Efficiencies, April 2014 (First Version April 2013).
- 87 Heimeshoff, Ulrich and Klein Gordon J., Bargaining Power and Local Heroes, March 2013.
- 86 Bertschek, Irene, Cerquera, Daniel and Klein, Gordon J., More Bits – More Bucks? Measuring the Impact of Broadband Internet on Firm Performance, February 2013.
Published in: Information Economics and Policy, 25 (2013), pp. 190-203.
- 85 Rasch, Alexander and Wenzel, Tobias, Piracy in a Two-Sided Software Market, February 2013.
Published in: Journal of Economic Behavior & Organization, 88 (2013), pp. 78-89.
- 84 Bataille, Marc and Steinmetz, Alexander, Intermodal Competition on Some Routes in Transportation Networks: The Case of Inter Urban Buses and Railways, January 2013.
- 83 Haucap, Justus and Heimeshoff, Ulrich, Google, Facebook, Amazon, eBay: Is the Internet Driving Competition or Market Monopolization?, January 2013.
Published in: International Economics and Economic Policy, 11 (2014), pp. 49-61.
- 82 Regner, Tobias and Riener, Gerhard, Voluntary Payments, Privacy and Social Pressure on the Internet: A Natural Field Experiment, December 2012.
- 81 Dertwinkel-Kalt, Markus and Wey, Christian, The Effects of Remedies on Merger Activity in Oligopoly, December 2012.
- 80 Baumann, Florian and Friehe, Tim, Optimal Damages Multipliers in Oligopolistic Markets, December 2012.

- 79 Duso, Tomaso, Röller, Lars-Hendrik and Seldeslachts, Jo, Collusion through Joint R&D: An Empirical Assessment, December 2012.
Published in: The Review of Economics and Statistics, 96 (2014), pp.349-370.
- 78 Baumann, Florian and Heine, Klaus, Innovation, Tort Law, and Competition, December 2012.
Published in: Journal of Institutional and Theoretical Economics, 169 (2013), pp. 703-719.
- 77 Coenen, Michael and Jovanovic, Dragan, Investment Behavior in a Constrained Dictator Game, November 2012.
- 76 Gu, Yiquan and Wenzel, Tobias, Strategic Obfuscation and Consumer Protection Policy in Financial Markets: Theory and Experimental Evidence, November 2012.
Forthcoming in: Journal of Industrial Economics under the title "Strategic Obfuscation and Consumer Protection Policy".
- 75 Haucap, Justus, Heimeshoff, Ulrich and Jovanovic, Dragan, Competition in Germany's Minute Reserve Power Market: An Econometric Analysis, November 2012.
Published in: The Energy Journal, 35 (2014), pp. 139-158.
- 74 Normann, Hans-Theo, Rösch, Jürgen and Schultz, Luis Manuel, Do Buyer Groups Facilitate Collusion?, November 2012.
- 73 Riener, Gerhard and Wiederhold, Simon, Heterogeneous Treatment Effects in Groups, November 2012.
Published in: Economics Letters, 120 (2013), pp 408-412.
- 72 Berlemann, Michael and Haucap, Justus, Which Factors Drive the Decision to Boycott and Opt Out of Research Rankings? A Note, November 2012.
- 71 Muck, Johannes and Heimeshoff, Ulrich, First Mover Advantages in Mobile Telecommunications: Evidence from OECD Countries, October 2012.
- 70 Karaçuka, Mehmet, Çatik, A. Nazif and Haucap, Justus, Consumer Choice and Local Network Effects in Mobile Telecommunications in Turkey, October 2012.
Published in: Telecommunications Policy, 37 (2013), pp. 334-344.
- 69 Clemens, Georg and Rau, Holger A., Rebels without a Clue? Experimental Evidence on Partial Cartels, April 2013 (First Version October 2012).
- 68 Regner, Tobias and Riener, Gerhard, Motivational Cherry Picking, September 2012.
- 67 Fonseca, Miguel A. and Normann, Hans-Theo, Excess Capacity and Pricing in Bertrand-Edgeworth Markets: Experimental Evidence, September 2012.
Published in: Journal of Institutional and Theoretical Economics, 169 (2013), pp. 199-228.
- 66 Riener, Gerhard and Wiederhold, Simon, Team Building and Hidden Costs of Control, September 2012.
- 65 Fonseca, Miguel A. and Normann, Hans-Theo, Explicit vs. Tacit Collusion – The Impact of Communication in Oligopoly Experiments, August 2012.
Published in: European Economic Review, 56 (2012), pp. 1759-1772.
- 64 Jovanovic, Dragan and Wey, Christian, An Equilibrium Analysis of Efficiency Gains from Mergers, July 2012.
- 63 Dewenter, Ralf, Jaschinski, Thomas and Kuchinke, Björn A., Hospital Market Concentration and Discrimination of Patients, July 2012 .
Published in: Schmollers Jahrbuch, 133 (2013), pp. 345-374.

- 62 Von Schlippenbach, Vanessa and Teichmann, Isabel, The Strategic Use of Private Quality Standards in Food Supply Chains, May 2012.
Published in: American Journal of Agricultural Economics, 94 (2012), pp. 1189-1201.
- 61 Sapi, Geza, Bargaining, Vertical Mergers and Entry, July 2012.
- 60 Jentzsch, Nicola, Sapi, Geza and Suleymanova, Irina, Targeted Pricing and Customer Data Sharing Among Rivals, July 2012.
Published in: International Journal of Industrial Organization, 31 (2013), pp. 131-144.
- 59 Lambarraa, Fatima and Riener, Gerhard, On the Norms of Charitable Giving in Islam: A Field Experiment, June 2012.
- 58 Duso, Tomaso, Gugler, Klaus and Szücs, Florian, An Empirical Assessment of the 2004 EU Merger Policy Reform, June 2012.
Published in: Economic Journal, 123 (2013), F596-F619.
- 57 Dewenter, Ralf and Heimeshoff, Ulrich, More Ads, More Revs? Is there a Media Bias in the Likelihood to be Reviewed?, June 2012.
Erscheint in: Economic Modelling.
- 56 Böckers, Veit, Heimeshoff, Ulrich and Müller Andrea, Pull-Forward Effects in the German Car Scrappage Scheme: A Time Series Approach, June 2012.
- 55 Kellner, Christian and Riener, Gerhard, The Effect of Ambiguity Aversion on Reward Scheme Choice, June 2012.
Published in: Economics Letters, 125 (2014), pp. 134-137.
- 54 De Silva, Dakshina G., Kosmopoulou, Georgia, Pagel, Beatrice and Peeters, Ronald, The Impact of Timing on Bidding Behavior in Procurement Auctions of Contracts with Private Costs, June 2012.
Published in: Review of Industrial Organization, 41 (2013), pp.321-343.
- 53 Benndorf, Volker and Rau, Holger A., Competition in the Workplace: An Experimental Investigation, May 2012.
- 52 Haucap, Justus and Klein, Gordon J., How Regulation Affects Network and Service Quality in Related Markets, May 2012.
Published in: Economics Letters, 117 (2012), pp. 521-524.
- 51 Dewenter, Ralf and Heimeshoff, Ulrich, Less Pain at the Pump? The Effects of Regulatory Interventions in Retail Gasoline Markets, May 2012.
- 50 Böckers, Veit and Heimeshoff, Ulrich, The Extent of European Power Markets, April 2012.
- 49 Barth, Anne-Kathrin and Heimeshoff, Ulrich, How Large is the Magnitude of Fixed-Mobile Call Substitution? - Empirical Evidence from 16 European Countries, April 2012.
Forthcoming in: Telecommunications Policy.
- 48 Herr, Annika and Suppliet, Moritz, Pharmaceutical Prices under Regulation: Tiered Co-payments and Reference Pricing in Germany, April 2012.
- 47 Haucap, Justus and Müller, Hans Christian, The Effects of Gasoline Price Regulations: Experimental Evidence, April 2012.
- 46 Stühmeier, Torben, Roaming and Investments in the Mobile Internet Market, March 2012.
Published in: Telecommunications Policy, 36 (2012), pp. 595-607.

- 45 Graf, Julia, The Effects of Rebate Contracts on the Health Care System, March 2012,
Published in: The European Journal of Health Economics, 15 (2014), pp.477-487.
- 44 Pagel, Beatrice and Wey, Christian, Unionization Structures in International Oligopoly,
February 2012.
Published in: Labour: Review of Labour Economics and Industrial Relations, 27 (2013),
pp. 1-17.
- 43 Gu, Yiquan and Wenzel, Tobias, Price-Dependent Demand in Spatial Models,
January 2012.
Published in: B. E. Journal of Economic Analysis & Policy, 12 (2012), Article 6.
- 42 Barth, Anne-Kathrin and Heimeshoff, Ulrich, Does the Growth of Mobile Markets
Cause the Demise of Fixed Networks? – Evidence from the European Union,
January 2012.
Forthcoming in: Telecommunications Policy.
- 41 Stühmeier, Torben and Wenzel, Tobias, Regulating Advertising in the Presence of
Public Service Broadcasting, January 2012.
Published in: Review of Network Economics, 11/2 (2012), Article 1.

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