

Herr, Annika; Hottenrott, Hanna

Working Paper

Higher prices, higher quality? Evidence from German nursing homes

DICE Discussion Paper, No. 208

Provided in Cooperation with:

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

Suggested Citation: Herr, Annika; Hottenrott, Hanna (2016) : Higher prices, higher quality? Evidence from German nursing homes, DICE Discussion Paper, No. 208, ISBN 978-3-86304-207-3, Heinrich Heine University Düsseldorf, Düsseldorf Institute for Competition Economics (DICE), Düsseldorf

This Version is available at:

<https://hdl.handle.net/10419/125801>

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 208

Higher Prices, Higher Quality? Evidence From German Nursing Homes

Annika Herr,
Hanna Hottenrott

January 2016

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, 2016

ISSN 2190-9938 (online) – ISBN 978-3-86304-207-3

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.

Higher Prices, Higher Quality? Evidence From German Nursing Homes*

Annika Herr[†] Hanna Hottenrott[‡]

January 2016

Abstract

Objectives: This study investigates the relationship between prices and quality of 7,400 German nursing homes controlling for income, nursing home density, demographics, labour market characteristics, and infrastructure at the regional level.

Method: We use a cross section of public quality reports for all German nursing homes, which had been evaluated between 2010 and 2013 by external institutions. Our analysis is based on multivariate regressions in a two stage least squares framework, where we instrument prices to explain their effect on quality.

Results: Descriptive analysis shows that prices and quality do not only vary across nursing homes, but also across counties and federal states and that quality and prices correlate positively. Second, the econometric analysis, which accounts for the endogenous relation between negotiated price and reported quality, shows that quality indeed positively depends on prices. In addition, more places in nursing

*We thank Boris Augurzky, Amela Saric, Hendrik Schmitz and two anonymous referees for helpful comments. Annika Herr gratefully acknowledges financial support by the BMBF under the research grant 01EH1102B.

[†]Düsseldorf Institute for Competition Economics (DICE), Heinrich-Heine-Universität, Düsseldorf and CINCH, Universität Duisburg-Essen.

[‡]Düsseldorf Institute for Competition Economics (DICE), Heinrich-Heine-Universität, Düsseldorf; Centre for European Economic Research (ZEW), Mannheim; and KU Leuven.

homes per people in need are correlated with both lower prices and higher quality. Finally, unobserved factors at the federal state level explain some of the variation of reported quality across nursing homes.

Conclusion: Our results suggest that higher prices increase quality. Furthermore, since reported quality and prices vary substantially across federal states, we conclude that the quality and prices of long-term care facilities may well be compared within federal states but not across.

JEL-Classification: I11, L11, L15, I18

Keywords: Nursing homes, care quality, price, long-term care, two-stage least squares

1 Introduction

An ageing population poses severe challenges with respect to financing and securing high quality long-term care. Long-term care is among the fastest growing branches of health care markets. For instance, in Germany, it increased from 8.6% of total health care expenditure in 1997 to 11.2% in 2013 (Augurzky et al., 2013). While prices and quality vary substantially across nursing homes (see, e.g., Mennicken, 2013), they may also be interdependent (Forder and Allan, 2014). On the one hand, higher prices may facilitate higher quality. On the other hand, since nursing homes can be classified as experience goods, high prices may be used to signal high quality irrespective of its actual level (Plassmann et al., 2008).

In this study, we exploit transparency reports, i.e., the quality report cards of 7,400 nursing homes in Germany, which were published between 2010 and 2013. Some studies for Germany have already described the relationship between nursing home prices and quality (Mennicken, 2013; Reichert and Stroka, 2014; Augurzky et al., 2010), however, without looking at the variation across federal states and without considering competition between nursing homes. Both Augurzky et al. (2010) and Mennicken (2013) find positive correlations between (some) quality measures and prices. Other find some quality indicators to be positively correlated with prices while others do not show any significant effect (Reichert and Stroka, 2014). Men-

nicken et al. (2014) explain differences in remuneration rates across German federal states, yet without controlling for quality differences. Looking at Medicaid reimbursement rates, Cohen and Spector (1996) and Grabowski (2001a) find an effect of higher reimbursement on staffing ratios but not on outcomes, while Grabowski (2001b) also shows a small increase in an outcome-oriented quality measure. Geraedts et al. (2015) show that quality differs significantly by ownership type. For-profit nursing homes provide lower quality than non-profit nursing homes in Germany independent of prices charged. Unlike these studies, the following analysis looks at quality conditional on prices and differentiates across federal states.

This study draws from Forder and Allan (2014) by using a two-stage least squares approach which instruments nursing home prices in the quality equation. They find that competition reduces prices which pushes down quality in English nursing homes (Forder and Allan, 2014).

We add to previous insights by investigating the relationship between prices and quality controlling for a large set of regional characteristics including income, nursing home density, demographics, and infrastructure. First, we show descriptively that quality and prices vary substantially across nursing homes, counties and federal states. Second, we find that quality indeed causally depends on prices in a two-stage least squares framework, which accounts for the endogenous relation between negotiated price and reported quality. Moreover, a county's higher number of places in nursing homes relative to people in need is associated both with lower prices and higher quality. Thus, more resources spent to build up capacities in those counties may contribute to higher average quality. Additionally, we find that unobserved factors at the federal state level explain a substantial part of the variation of reported quality across nursing homes.

2 Institutional background

Health insurance and long-term care insurance are mandatory in Germany and are offered as one package both in the private and the statutory system. Of all insured, 54% belong to health insurances organised at the federal state

level (BMG, 2015), while the remaining health insurances are organised at a different regional or at the national level.

In principle, there is no regulated upper limit for the price that nursing homes may charge. However, prices cannot be set freely but are negotiated for a certain time (at least one year) between each provider and the affected sickness funds (§85, SGB IX) of the provider's residents. In a second step, contracts between nursing homes and residents are individually agreed on. Formal care is partly financed by the health plan and partly out-of-pocket. If the residents (or their families) cannot afford it, social welfare covers the private share of the price. The part paid by the long-term care insurance is constant across federal states and nursing homes and only depends on the care level of the individual in need.

The care level is set by the regional Medical Review Boards (MRB) of the German Statutory Health Insurance after an examination of the individual's needs. The MRBs are organised at the federal state level with three exceptions: North Rhine-Westphalia is the largest state in terms of population and is thus split into North Rhine and Westphalia-Lippe, while Schleswig-Holstein and Hamburg as well as Berlin and Brandenburg are organised in one MRB, respectively. In our analysis, we split the federal state effect of North Rhine-Westphalia into two regional binary indicators and combine Schleswig-Holstein and Hamburg as well as Berlin and Brandenburg accordingly to control for the impact of the respective MRB together with many other unobserved factors at federal state level (e.g, education or other political decisions).

In 2008, the "care transparency agreement" (CTA) was introduced to increase transparency regarding the services offered and the quality of the nursing homes. The evaluation process is carried out by the regional MRBs. Trained representatives of the independent MRBs evaluate all nursing homes regularly. The same 64 criteria are tested in all nursing homes and the reporting of the results is standardised. The results of each evaluation are published in online report cards (for instance, at www.pflegelotse.de or www.bkk-pflegefinder.de), where only the latest report is available. For a more detailed discussion of the chances and drawbacks of the German

transparency reports we refer to Herr et al. (2015).

3 Estimation strategy

In the following, we present our econometric approach to study variation in nursing home quality. In particular, we estimate the quality of nursing home i as a function of its average price, its size and regional characteristics at the county level, such as income, supply density, demographics or infrastructure. We apply a two-stage least squares framework (using the `ivreg2` STATA-command by Baum et al., 2015). Due to reverse causality problems and possible unobserved factors influencing both, quality and price, we follow Forder and Allan (2014) and instrument the price in the quality regression. That is, we estimate a first stage in which we regress the endogenous price on all control variables as well as three exogenous instruments. Since prices are negotiated with the payors for a specific period (at least one year) and are (at least partly) not dependent on the resident (the same price for housing and investments applies to all residents), prices are less adjustable than quality in the short run. Furthermore, the price serves as an important policy variable and can be adjusted according to the respective goals in the negotiations, while quality is more difficult to regulate and monitor. In the second stage, the predicted price, which is now independent of unobserved correlations between quality and price, is used to explain variations in quality. The baseline 2SLS specification can be written as:

$$Price = \beta_0 + \beta_1 IV_1 + \beta_2 IV_2 + \beta_3 IV_3 + R\gamma + T\delta + FS\lambda + v \quad (1)$$

$$Care\ quality = \beta_0 + \beta_1 \widehat{Price} + R\mu + T\nu + FS\pi + \varepsilon \quad (2)$$

where price is measured either as the private contribution (overall fee minus the subsidies by the long-term care insurance) and net of investment costs (*Price*) or –in the robustness checks– including investment costs (*total price*). The quality measure *Care quality* is described in Section 4.1. The matrix R comprises county-level characteristics, such as income, supply density, demographics or infrastructure as well as the nursing home specific number

of residents. T refers to the year of evaluation and FS comprises the set of federal state dummies which capture the remaining unobserved influences of the regional sickness funds, their strategies and their negotiation strength as well as unobserved time-independent differences across medical review boards in monitoring nursing home quality. $\gamma, \delta, \lambda, \mu, \nu$ and π are vectors of estimated coefficients.

We test the validity of the instrumental variables IV_1, IV_2 , and IV_3 by verifying their relevance in equation (1), i.e. whether they cause variation in prices. Second, they should not have a direct effect on the outcome variable in equation (2) given the other exogenous control variables, but only indirectly through the price.

IV_1 refers to a county's physician density which is measured as the number of inhabitants per doctor including general practitioners and specialists (*Inhab. per physician*). A higher density around a nursing home's location could increase the price potential residents are willing to pay for a place in that home in expectation of a better overall provision of medical services. Controlling for hospital beds, population density and nursing home personnel, we argue that the actual quality of care –as measured with the seven risk factors described in Section 4.1– provided within the nursing home in the second stage is not directly affected by the availability of outside medical staff. IV_2 measures the average share of untouched nature per area (*share of untouched nature*). A location within a green environment (controlling for many factors such as population density or touristic attractiveness in the second stage) may increase prices, but does not affect care quality within the individual home. The last instrument, IV_3 , captures the average available income at county level and represents a measure of the ability to pay, which does not influence quality directly other than through price or the overall GDP and pensions (second stage).

With regard to the first condition, the F-test of excluded instruments yields a partial F-test statistic of $F(3, 7343) = 20.65$ in the first stage of the main model (Table 2, model 1) and $F(3, 6191) = 30.36$ including inv. costs (Table 2, model 3). Both values are well above the commonly applied criterion of 10 (Stock and Yogo, 2005). Second, the validity of the instruments,

i.e. that they are uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated equation, cannot be rejected by the Hansen J test with a p-value of the test statistic of 0.11 (0.92).

Besides the linear model specification presented above, we further account for the censoring of the quality scores both at the lower and upper limit (quality $\in [0, 1]$) by estimating two-sided censored IV Tobit models (for more details compare Wooldridge, 2001, ch. 16). The first stage is specified as before and its estimation results are very similar (not presented).

4 Data and descriptive statistics

The data for our analysis stems from two data sources. Information on nursing home prices, location and quality is taken from the report cards of German nursing homes. A large set of regional characteristics and socio-economic control variables at the county level have been gathered from the Federal Office for Building and Regional Planning (INKAR) for the latest year available (2011).

The report cards are available online for all homes in Germany. We focus on general long-term care, that is, we exclude nursing homes that only provide short-term and out-patient care as well as care for children and (younger) people with health conditions or impairments. In addition, we exclude homes that specialise in certain illnesses such as apallic conditions, multiple sclerosis, stroke, or dementia patients and micro homes with fewer than 10 residents, which leaves us with 10,035 observations. We aggregate nursing home information at the address level to obtain average prices and quality and the total number of residents in cases (17) where there are two reports available for separate buildings with the same address.

We control for the year of evaluation since nursing homes were evaluated at different points in time between 2010 and March 2013. After eliminating incomplete records and the largest percentile of nursing homes in terms of residents, the final data set comprises information on 7,382 nursing homes and the 400 (out of 412) counties they are located in. Most of the records (6,296 homes, 85%) stem from 2012 while the others stem from 2010

(24), 2011 (239) and the beginning of 2013 (823). We observe each nursing home only once.

4.1 Quality measure

The first public reporting of quality information in the U.S. started in 2002 with the well-analysed Nursing Home Compare (NHC) initiative and some studies show that information disclosure improves the nursing homes' quality (Lu, 2012; Mukamel et al., 2008), while others find mixed results (Grabowski and Town, 2011).

Herr et al. (2015) show that the reported quality of nursing homes also increased after the first publication of the report cards in Germany in 2010. While the reported quality may not capture all quality aspects and unreported quality may be harmed due to the concentration of resources on reported measures (Lu, 2012), this does not pose a problem for our analysis since reporting is unified across federal states as should be any distortion. In contrast to other studies, our quality measures are mainly objective and based on evaluations by an external institution, the Medical Review Boards. The inspectors of the MRBs test a subgroup of residents in the nursing home, say 10 people, to substantiate whether a criterion is fulfilled and calculate the percentage of individuals for whom it holds true. Then, until 2013, the percentage value was translated into a grade according to the German system of school grades from 1.0 (= excellent) to 5.0 (= inadequate or failed).

We focus on the following seven "risk factors" among the 64 quality indicators in the report cards following the definition of Hasseler and Wolf-Ostermann (2010).

1. Is the nutritional status appropriate given the possibility of influence by the institution? (Q15)
2. Is the supply of fluids appropriate given the possibility of influence by the institution? (Q18)
3. Are documents regarding the treatment of chronic wounds or bed-sores analysed and, if necessary, the measures adjusted? (Q11)

4. Are systematic pain assessments conducted? (Q20)
5. Are individual risks and resources of residents with incontinence or a bladder catheter assessed? (Q22)
6. Is the individual risk of contracture collected? (Q27)
7. Do measures restricting the individual freedom require consent? (Q29)

The remaining ones mainly measure processes and services and are arguably uninformative with regards to care quality. Like Herr et al. (2015), we follow the idea by Hendrik Schmitz and Boris Augurzky and construct an aggregate measure of care quality using these seven indicators. We suppose that for each criterion truly good quality is provided only if the maximum grade of 1.0 (excellent) was achieved. Negligence of even a single resident would indicate severe quality deficiencies, for instance, when considering the supply of fluids. More precisely, we define binary indicators q_j for criterion j to equal one if the criterion is fulfilled for all tested residents and zero otherwise.

$$q_k = \begin{cases} 1 & \text{if grade}_j = 1.0 \\ 0 & \text{if grade}_j < 1.0 \end{cases}$$

The final indicator *Care quality* spanning all seven risk criteria is defined as

$$\text{Care quality} = \frac{1}{7} \sum_{k=1}^7 q_k \quad k = 1, \dots, 7$$

In order to avoid potential selection bias due to missing values, *Care quality* is redefined, as question 11 (3.) and 29 (7.) have a high number of missing values. If one of the two values is missing, the share is reduced to $(\frac{0}{6}; \dots; \frac{6}{6})$ or, if both are missing, to $(\frac{0}{5}; \dots; \frac{5}{5})$. These outcomes are then mapped on a $(\frac{0}{6}; \dots; \frac{6}{6})$ scale to the closest neighbouring value.

Following Dranove and Sfekas (2008), we assume that better report card scores in these selected questions reflect better underlying quality and not better selection of less severely-ill residents (Dranove et al., 2003). Five of the seven quality measures are more related to assessment than actual health

outcomes. Moreover, by dropping nursing homes from the sample that are specialized in diseases like dementia (which may make, for instance, the supply of fluids more difficult), we reduce the likelihood of such a selection bias.

4.2 Price measures

The mandatory long-term care insurance pays a share of the price only depending on the individual's care level, independent of the total price or regional characteristics (see section 2). In 2011, health plans covered between €1,023 (care level I) to €1,550 (care level III) per month. The additional private contribution, which is borne by the individual herself (or family members), is defined as the total monthly price net of health plan coverage. We further deduct investment costs, since these are not available for Hamburg and North Rhine, and use the net price (*price*). Furthermore, we average across the three care levels at each nursing home. We also look at the price including investment costs in our robustness checks. We exclude the lowest and the highest percent of the price distribution to reduce the influence of outliers. The private contribution in our sample varies between €454 and €1,817 per month, paid out-of-pocket. The average price is €1,101 per month. All prices and income variables are deflated, with 2009 as the base year.

4.3 Regional control variables

County-level variables are grouped into a) supply density, which is measured by the number of nursing homes, its squared value and the number of available places per 100 inhabitants at county level. Moreover, we distinguish between b) demographic factors (informal care recipients relative to all people in need as well as the number of people in need, hospital beds, and personnel in nursing homes per 100 inhabitants) and c) income-related variables (GDP per inhabitant, unemployment share, pensions, average hourly wage), which reflect the prosperity of the region. The last group d) consists of infrastructure characteristics (price for land, the ser-

vice sector ratio, share of foreign tourists to all people staying over night, and population density). Table 1 presents the most important descriptive statistics as well as the units of measurement.

[Table 1 about here]

4.4 Regional variation

The maps depicted in Figure 1 illustrate regional variation in the supply and demand of stationary long-term care across counties. An exception is panel d), which shows the average number of places per 10,000 inhabitants at the federal state level. We do not observe 12 of the 412 counties in our final sample. The graphs show that besides variation in quality and prices across different nursing homes, there are regional patterns for both indicators. Whereas we see a strong price differential between the north-east and the south-west with considerably higher prices in western and south-western counties (panel b)), the picture for quality is less clear. Reported care quality is lowest in the south-east (a) and highest in Baden-Württemberg, Saxony and North Rhine. However, quality-price ratios (c) are highest in north, central and eastern Germany.

Maps d) and e) show regional variation in the number of places in nursing homes per county as well as in the number of people in need (both per 10,000 inhabitants). It is noteworthy that the share of people in need is higher in central and particularly eastern counties, while the number of places tends to be higher in north and central states and in Saxony. Finally, map f) shows that the supply density (number of places per people in need) is highest in the northern counties and in Bavaria. The presence of the described regional patterns suggests that much of that variation might be explained by regional differences in income, supply, demographic factors and infrastructure, for which we control in the analysis. However, there may also be unobserved differences in negotiations at the federal state level or in evaluation practices at the MRB level, which affect both prices and the reported quality. We control for such time-invariant effects by introducing federal state indicators.

[Figure 1 about here]

5 Results

5.1 First stage: Price

Results from the first stages (from the main model and the robustness checks in Table 4) are presented in Table 2. The three instrumental variables show the expected signs. While a higher share of untouched nature and a higher available income increase the price, the lower physician density (more inhabitants per physician) decreases the price. Furthermore, supply density measured as the number of nursing homes per county given the number of people in need and population density is negatively correlated with the price if the number of nursing homes is low (below the tenth percentile of the distribution). If a county has more than 15 nursing homes, prices and the number of nursing homes are positively associated. We argue that, with respect to the former result, entry does not necessarily occur in those counties with higher average prices due to two reasons: First, prices are negotiated mainly on the basis of the cost structure and second, other regional regulatory rules regarding the facilities and the personnel structure play also a big role for the entry decision.

[Table 2 about here]

The overall number of places in nursing homes per people in need (both measured at county level) shows that a lower supply density (more available places) is associated with a lower price. Finally, a higher price is associated with a lower share of people in need, higher pensions, a better personnel relation (price negotiations depend on the nursing home's personnel structure), more hospital beds and a higher share of informal care (lower demand for nursing homes) in the region, where the latter may be also due to capacity constraints.

5.2 Second stage: Quality

Table 3 presents the second stage results from the preferred specification (OLS, 2SLS, and IV Tobit models). In all specifications the price enters the quality equation positively and is statistically significant. While the OLS estimates suffer from endogeneity, Model (2) suggests that a 10% price increase is associated with a 3.9 percentage point increase in the care quality index. The Tobit model (3), which accounts for the censored dependent variable, suggests a 5.5 percentage point increase in the predicted care quality index, which lies at 73% on average.

Regional control variables are jointly significant at the 1% level ($\chi^2(16) = 34.82$). In particular, the variables subsumed as measures of the supply density show significant coefficients. First, the number of nursing homes per county and quality have an inverse U-shaped relationship, which turns negative when the number of nursing homes is above the median (30) per county. Second, a higher share of places in nursing homes per people in need is associated with a higher quality. This means that more supply per person in need is correlated both with lower prices and higher quality. Importantly, we find that even after controlling for a large set of regional characteristics, the federal state fixed effects are highly significant.

[Table 3 about here]

Figure 2 depicts the federal state coefficients (relative to Schleswig-Holstein/Hamburg). We find a pattern of higher quality in Lower Saxony and in Saxony while quality is lowest in four western German states (Westphalia-Lippe, Rhineland-Palantine, Bavaria, and Saarland) (panel a)). Looking at prices (panel b)) in the first stage, the difference between eastern and western Germany is even more distinct (all eastern German federal states and Bremen and Lower Saxony have lower prices relative to Schleswig-Holstein/Hamburg and all else equal, while the other western states negotiate higher prices).

The unobserved characteristics at the federal state level, such as price negotiations with regional long-term care insurances or quality evaluations at MRB-level, may have an important effect on the nursing home's reported

quality and initially also on prices (compare right of figure 2). Another reason for the regional-level differences may be the high investment level in the eastern part of Germany after reunification, when modern nursing homes were built offering new equipment at lower prices. Thus, the differences in quality may be due to different evaluation methods or strategies at the federal state level or due to true quality differences, which we cannot disentangle here.

[Figure 2 about here]

5.3 Robustness checks

Table 4 presents several robustness checks. First, we reduced the sample and kept only those nursing homes with information on investment costs. We re-estimated the main model (Table 4, models 2 and 5) as well as the one with the total price (including investment costs) as outcome (models 3 and 6). Reducing the sample (mainly dropping Rhineland and Hamburg) decreases the price coefficients slightly while the choice of the price variable itself does not matter. Second, we dropped 15% of the nursing homes which were evaluated before or after 2012. The price coefficients increase (from 0.39 to 0.51 in the 2SLS case), while signs and significance levels are stable. Thus, our preferred specifications present lower bounds to the price effect.

[Table 4 about here]

6 Discussion and conclusion

This paper shows and partly explains variation in the quality of German nursing homes. First, our descriptive analysis hints at the variation in prices, quality and supply across German counties. Second, accounting for the endogenous relation between quality and price in a two-stage least squares framework and for a detailed set of important predictors (demographics, income, infrastructure and health care), we show that a higher price in-

creases quality significantly. In addition, a higher number of places in nursing homes per people in need is associated with lower prices and higher quality, all else equal. This result adds to the discussion about increasing resources for long-term care, which resulted in the recent reforms in Germany increasing premia to and payments of the mandatory long-term care insurance in 2013, 2015, and 2017. These reforms are meant to improve care for people suffering dementia and introduces additional care levels. This study adds to these means to improve care by showing that at the individual nursing home level more resources are needed especially in those federal states which face a growing demand and low supply.

Third, we show that the federal state indicators additionally capture a considerable part of the unobserved variation in quality (and prices when looking at the first-stage results). There may be several reasons for the substantial variation across federal states. First, quality is measured by representatives of the 15 regional MRBs. Thus, differences in quality may either be due to true quality differences or due to different evaluation methods or strategies of the specific MRB in charge. Second, while the subsidies paid by the long-term care insurance to people in need are constant across Germany for a given year and care level, final prices are negotiated between each individual nursing home and the affected statutory long-term care funds within the federal state. This may lead to different average levels of (measured) quality as well as prices across federal states. Within each federal state, quality and prices also vary substantially but should be more comparable. Thus, the distortion by possible different measurement policies, ownership type structure or different bargaining powers of the partners can be levelled out within a federal state but should be considered when comparing nursing homes across federal states.

Finally, the results also show that a considerable part of the variation in quality cannot be explained. This may, on the one hand, be due to missing information on individual facilities, such as the ownership type (Geraedts et al., 2015) or the management, whether the nursing home is part of a chain, whether it is linked to neighboured hospitals or ambulatory facilities or the case-mix of the residents. Furthermore, we only observe the county-specific

care personnel, but not the number of nurses or other staff in the specific nursing homes. This information could serve as a different quality signal. Another limitation of this study lies in the cross-sectional structure of the data. We can only account for unobserved heterogeneity at the federal state level. Therefore, we suggest further research on factors that support care quality. A better understanding of these will contribute to the effectiveness of reforms aiming at securing supply and cost-efficiency without jeopardising care quality.

References

- Augurzky, B., Hentschker, C., Krolow, S., and Mennicken, R. (2013). *Pflegeheim Rating Report 2013 – Ruhiges Fahrwasser erreicht*. Vincentz Network: Hannover.
- Augurzky, B., Mennicken, R., Röhrig, B., and Weibler-Villalobos, U. (2010). Bietet ein teureres Pflegeheim auch eine bessere Qualität? Evidenz aus Rheinland-Pfalz. *Gesundh ökon Qual manag*, 15:292–298.
- Baum, C., Schaffer, M., and Stillman, S. (2015). Ivreg2: Stata module for extended instrumental variables/2sls and gmm estimation. last visited: 2015-12-23, <http://EconPapers.repec.org/RePEc:boc:bocode:s425401>.
- BMG (2015). Aufgaben und Organisation der GKV. Technical report, last visited: 2015-12-23. <http://www.bmg.bund.de/themen/krankenversicherung/grundprinzipien/aufgaben-und-organisation-der-gkv.html>.
- Cohen, J. W. and Spector, W. D. (1996). The effect of Medicaid reimbursement on quality of care in nursing homes. *Journal of Health Economics*, 15(1):23 – 48.
- Dranove, D., Kessler, D., McClellan, M., and Satterthwaite, M. (2003). Is more information better? The effects of report cards on health care providers. *The Journal of Political Economy*, pages 555–588.

- Dranove, D. and Sfekas, A. (2008). Start spreading the news: A structural estimate of the effects of new york hospital report cards. *Journal of Health Economics*, 27:1201–1207.
- Forder, J. and Allan, S. (2014). The impact of competition on quality and prices in the English care homes market. *Journal of Health Economics*, 34(0):73 – 83.
- Geraedts, M., Harrington, C., Schumacher, D., and Kraska, R. (2015). Trade-off between quality, price, and profit orientation in Germany’s nursing homes. *Ageing International*, pages 1–10.
- Grabowski, D. C. (2001a). Does an increase in the Medicaid reimbursement rate improve nursing home quality? *Journal of Gerontology: SOCIAL SCIENCES*, 56B(2):S84–S93.
- Grabowski, D. C. (2001b). Medicaid reimbursement and the quality of nursing home care. *Journal of Health Economics*, 20(4):549 – 569.
- Grabowski, D. C. and Town, R. J. (2011). Does information matter? Competition, quality, and the impact of nursing home report cards. *Health Services Research*, 46(6pt1):1698–1719.
- Hasseler, M. and Wolf-Ostermann, K. (2010). Stärken und Schwächen. Pflege-Transparenzvereinbarung. *Altenheim*, 49(9):30–33.
- Herr, A., Nguyen, T.-V., and Schmitz, H. (2015). Does quality disclosure improve quality? Responses to the introduction of nursing home report cards in Germany. *DICE Discussion Papers*.
- Lu, S. F. (2012). Multitasking, information disclosure, and product quality: Evidence from nursing homes. *Journal of Economics & Management Strategy*, 21(3):673–705.
- Mennicken, R. (2013). Prices and quality in nursing homes - first empirical results for Germany. *Gesundheitswesen*, 75(2):99–101.

- Mennicken, R., Augurzky, B., Rothgang, H., and Wasem, J. (2014). Explaining differences in remuneration rates of nursing homes in Germany. *European Journal of Health Economics*, 15:401–410.
- Mukamel, D. B., Weimer, D. L., Spector, W. D., Ladd, H., and Zinn, J. S. (2008). Publication of quality report cards and trends in reported quality measures in nursing homes. *Health Services Research*, 43(4):1244 – 1262.
- Plassmann, H., O’Doherty, J., Shiv, B., and Rangel, A. (2008). Marketing actions can modulate neural representations of experienced pleasantness. *PNAS*, 105(3):1050–1054.
- Reichert, A. R. and Stroka, M. A. (2014). Nursing home prices and quality of care: Evidence from administrative data. Ruhr Economic Papers 470, RWI, Essen.
- Stock, J. and Yogo, M. (2005). Testing for weak instruments in linear iv regression. In Andrews, D. W., editor, *Identification and Inference for Econometric Models*, pages 80–108. Cambridge University Press, New York.
- Wooldridge, J. M. (2001). *Econometric Analysis of Cross Section and Panel Data*, volume 1 of *MIT Press Books*. The MIT Press.

Tables and Figures

Table 1: Descriptives: Regional characteristics

Variable	Unit	Mean	Std. Dev.	Min.	Max.
Nursing home level					
Care quality	[0/6-6/6]	0.73	0.22	0	1
Price	[EUR/month]	1,100	317	454	1,817
Price [EUR] incl. Inv. Costs ^a		1,425	338	549	2,531
# of residents	[100]	0.76	0.38	0.1	2.16
County level					
<i>Supply density</i>					
# of NH per county		42.89	50.20	3.00	278
Places per ppl in need		0.36	0.08	0.18	0.67
<i>Demographics</i>					
Informal care ^b /all ppl in need		0.46	0.06	0.28	0.66
People in need	[#/ 100 inhab.]	3.14	0.67	1.55	5.43
Hospital beds	[#/ 100 inhab.]	0.61	0.30	0	2.15
Personnel in NH	[#/ 100 inhab.]	0.85	0.21	0.35	2.01
<i>Income</i>					
GDP/inhab.	[1,000 Euro]	28.61	10.69	13.83	103.96
Unemployment share	2009	0.11	0.06	0.02	0.25
Pensions men	[Euro/month]	1,010	73	823	1307
Pensions women	[Euro/month]	538	95	365	762
Average hourly wage	[Euro/hour]	25.08	3.43	15.93	35.44
<i>Infrastructure</i>					
Population density	[#/100 km ²]	7.18	9.58	0.38	44.36
Price for land	[Euro/m ²]	147.45	146.10	5.70	1,123.54
Share of foreign tourists	%	14.6	9.98	0.80	56
Service sector ratio	2009	0.32	0.13	0.13	0.93
<i>Instruments for price</i>					
Inhab. per physician	[in 100]	6.58	1.66	2.57	12.14
Share of untouched nature	[% , 2009]	0.8	1.7	0	25.34
Annual available income	[1,000 euro]	18.71	2.27	13.61	30.86
# of NH		7,382			
# of counties		400			

Source: Transparency reports (NH-level) and INKAR, base year 2011 if not indicated else.

^a Total price including investment costs only available for 6,229 obs.

^b receiving benefits from insurance. NH: Nursing Home.

Table 3: Quality regressions OLS, 2SLS, and Tobit-IV

		(1) OLS	(2) 2SLS	(3) IV-Tobit
NH specific	price / $\log(\widehat{price})^a$	0.085*** (0.014)	0.386** (0.175)	0.545** (0.246)
	Residents	-0.116*** (0.023)	-0.198*** (0.053)	-0.270*** (0.074)
	Residents ²	0.015 (0.012)	0.050** (0.023)	0.070** (0.032)
Supply density	Log(# of NH)	0.088*** (0.028)	0.134*** (0.039)	0.169*** (0.050)
	[Log(# of NH)] ²	-0.012*** (0.004)	-0.020*** (0.006)	-0.026*** (0.008)
	Places in NH/ppl in need	0.062 (0.092)	0.288* (0.163)	0.372* (0.221)
Demographics	Ppl in need	0.011 (0.011)	0.045** (0.023)	0.061* (0.031)
	Hospital beds	0.002 (0.014)	-0.016 (0.017)	-0.019 (0.022)
	Personnel in NH	-0.030 (0.035)	-0.095* (0.052)	-0.117* (0.070)
Income	Log(GDP/inhab.)	0.010 (0.024)	-0.001 (0.026)	-0.019 (0.034)
	Unemployment share	-0.045 (0.131)	-0.002 (0.136)	-0.017 (0.173)
	Log(pensions men)	0.049 (0.058)	0.008 (0.064)	0.009 (0.082)
	Log(pensions women)	0.082** (0.041)	0.060 (0.044)	0.085 (0.056)
	Average hourly wage	-0.004 (0.003)	-0.005* (0.003)	-0.004 (0.004)
Infrastructure	Log(price for land)	-0.006 (0.008)	-0.010 (0.009)	-0.013 (0.012)
	Population density	-0.001** (0.001)	-0.002** (0.001)	-0.003*** (0.001)
	Share of foreign tourists	0.001 (0.000)	0.000 (0.000)	0.000 (0.001)
	Service sector ratio	0.021	0.043	0.075
<i>To be continued on next page</i>				

Table 3: Quality regressions OLS, 2SLS, and Tobit-IV: continued

	(1)	(2)	(3)
	OLS	2SLS	IV-Tobit
	(0.059)	(0.062)	(0.080)
Share of benefit receivers	0.091	0.036	0.082
	(0.087)	(0.094)	(0.120)
Federal states / Schleswig-Holstein/Hamburg			
MRBs (Reference category)			
Lower Saxony	0.048***	0.083***	0.110***
	(0.015)	(0.026)	(0.035)
Bremen	-0.004	-0.001	0.003
	(0.032)	(0.031)	(0.038)
North Rhine	0.064***	-0.033	-0.070
	(0.019)	(0.059)	(0.083)
Westphalia-Lippe	-0.050***	-0.123***	-0.178***
	(0.018)	(0.045)	(0.063)
Hesse	0.040*	0.018	0.007
	(0.021)	(0.025)	(0.033)
Rhineland-Palatinate	-0.078***	-0.157***	-0.213***
	(0.022)	(0.051)	(0.070)
Baden-Württemberg	0.121***	0.062	0.084
	(0.017)	(0.039)	(0.054)
Bavaria	-0.082***	-0.124***	-0.160***
	(0.017)	(0.030)	(0.040)
Saarland	-0.038	-0.121**	-0.171**
	(0.027)	(0.055)	(0.076)
Brandenburg/Berlin	-0.018	0.001	0.005
	(0.024)	(0.027)	(0.034)
Mecklenburg-W. Pomerania	-0.017	0.050	0.078
	(0.031)	(0.050)	(0.067)
Saxony	0.058**	0.164**	0.227**
	(0.025)	(0.067)	(0.092)
Saxony-Anhalt	-0.010	0.067	0.103
	(0.026)	(0.052)	(0.071)
Thuringia	-0.111***	-0.046	-0.036
	(0.029)	(0.048)	(0.063)
Time FE	Yes	Yes	Yes
<i>To be continued on next page</i>			

Table 3: Quality regressions OLS, 2SLS, and Tobit-IV: continued

	(1)	(2)	(3)
	OLS	2SLS	IV-Tobit
N	7,382	7,382	7,382
adj. R ²	0.15	0.10	
F	41.57	37.00	
Partial F (first stage)		20.65	
Hansen's J		4.48	
Hansen's J p-value		0.11	

Marginal effects; Std. errors in parentheses: * $p < 0.1$, $p < 0.05$, *** $p < 0.01$. Constant included. Quality $\in (\frac{0}{6}, \frac{1}{6}, \dots, \frac{6}{6})$

a: Predicted price in 2SLS-IV and IV-Tobit. Instruments: Share of untouched nature, available income, inhab. per physician

Data: Transparency reports 2010-2013 (NH-level) and INKAR 2011 (county level).

Table 2: 2SLS first stages: Main results and robustness checks

	(1) Log(price) Final	(2) Log(price) Sample with inv. costs	(3) Log(Total Price)	(4) Log(price) only 2012
Instruments				
Share of untouched nature	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)
Available income	0.008*** (0.002)	0.007*** (0.002)	0.007*** (0.001)	0.006*** (0.002)
Inhab. per physician	-0.012*** (0.002)	-0.016*** (0.003)	-0.016*** (0.002)	-0.010*** (0.003)
Residents	0.278*** (0.020)	0.285*** (0.022)	0.218*** (0.019)	0.284*** (0.021)
(Residents) ²	-0.116*** (0.010)	-0.119*** (0.012)	-0.095*** (0.010)	-0.120*** (0.011)
Log(# of NH)	-0.132*** (0.021)	-0.097*** (0.022)	-0.094*** (0.018)	-0.149*** (0.023)
[Log(# of NH)] ²	0.025*** (0.003)	0.019*** (0.003)	0.018*** (0.003)	0.027*** (0.003)
Places per ppl in need	-0.768*** (0.070)	-0.694*** (0.076)	-0.376*** (0.060)	-0.747*** (0.075)
Log price for land	0.000 (0.007)	-0.005 (0.008)	0.000 (0.006)	-0.002 (0.008)
Log(GDP/inhab.)	0.024 (0.020)	0.053** (0.021)	0.010 (0.018)	0.038* (0.021)
Unemployment share	0.005 (0.121)	0.039 (0.139)	-0.201* (0.108)	-0.027 (0.130)
Log pensions men	0.200*** (0.048)	0.172*** (0.055)	0.149*** (0.046)	0.213*** (0.052)
Log pensions women	-0.025 (0.038)	0.039 (0.041)	0.054 (0.033)	0.009 (0.041)
Average hourly wage	0.003 (0.002)	-0.001 (0.002)	0.003* (0.002)	0.002 (0.002)
Share of benefit receivers	0.200*** (0.070)	0.350*** (0.078)	0.444*** (0.063)	0.226*** (0.074)
Ppl in need	-0.116*** (0.008)	-0.125*** (0.009)	-0.088*** (0.007)	-0.118*** (0.009)
Hospital beds	0.043*** (0.011)	0.022* (0.012)	0.008 (0.010)	0.044*** (0.013)
Personel in NH	0.212*** (0.027)	0.233*** (0.029)	0.161*** (0.024)	0.214*** (0.029)
Federal state FE	Yes	Yes	Yes	Yes
Infrastructure variables	Yes	Yes	Yes	Yes
N	7,382	6,229	6,229	6,296
adjusted R ²	0.71	0.68	0.69	0.72
Partial F first stage	20.65	22.11	30.36	13.73

Marginal effects; Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Data: Transparency reports 2010-2013 (NH-level) and INKAR 2011 (county level).

Models (2), (3): Total price including investment costs only available for 6,229 obs.

Column (1) relates to Table 3, column (2). 23

Columns (2)-(4) relate to Table 4, columns (1)-(3), respectively.

Table 4: Robustness checks: 2SLS-IV and Tobit quality regressions with different samples and prices

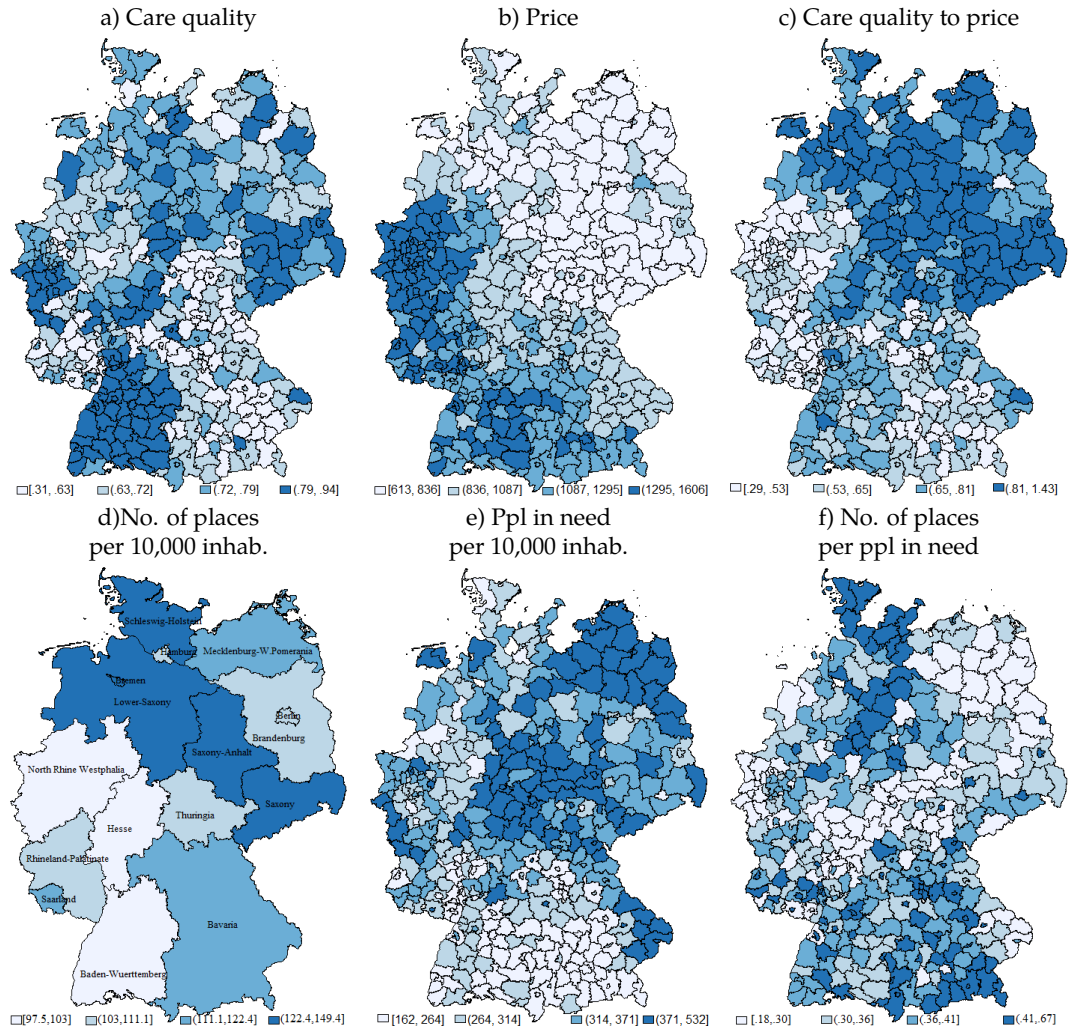
	(1)	(2)	(3)	(4)	(5)	(6)
	2SLS-IV			Tobit		
Care quality	Sample with inv. costs only 2012			Sample with inv. costs only 2012		
$\log(\widehat{price})^a$	0.341** (0.164)		0.507** (0.208)	0.456** (0.206)		0.723** (0.306)
$\log(\widehat{total\ price})^a$		0.363** (0.173)			0.486** (0.217)	
Year FE	Yes	Yes	No	Yes	Yes	No
Federal state FE	Yes	Yes	Yes	Yes	Yes	Yes
Regional variables	Yes	Yes	Yes	Yes	Yes	Yes
N	6,229	6,229	6,296	6,229	6,229	6,296
adj. R ²	0.12	0.12	0.05			
Partial F (1. stage)	22.11	30.36	13.73			
Hansen's J	0.21	0.16	4.80			
Hansen's J p-value	0.90	0.92	0.09			

Marginal effects; Std. errors in parentheses: * $p < 0.1$, $p < 0.05$, *** $p < 0.01$. Constant included.

Quality $\in (\frac{0}{6}, \frac{1}{6}, \dots, \frac{6}{6})$ a: Predicted price in 2SLS-IV and IV-Tobit.

Instruments used for prices: Share of untouched nature, available income, inhab. per physician.

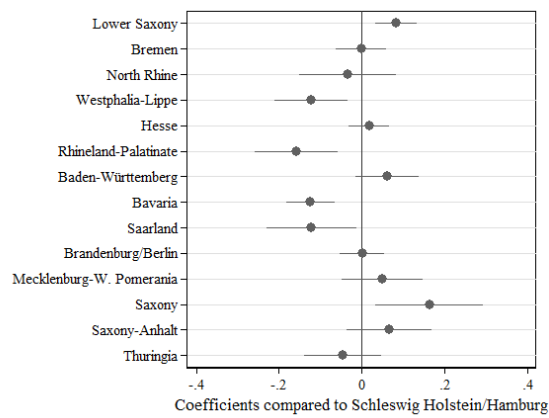
Figure 1: Prices, care quality and supply density at county level



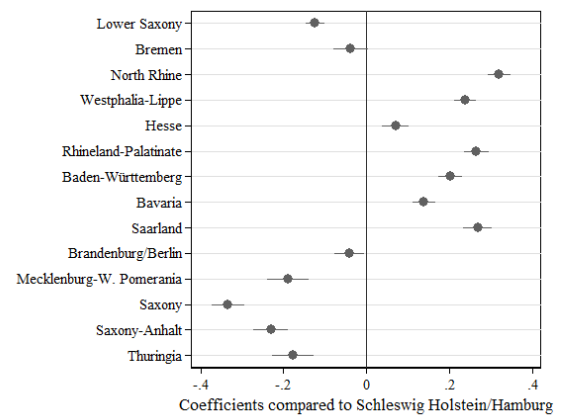
Data: Transparency reports (2010–2013) and INKAR 2011. Averages of the respective variables at county level (panel d) at federal state level), 400 counties, 16 federal states, 15 MRBs (North Rhine Westphalia is split into Westphalia-Lippe and North Rhine, while Hamburg and Schleswig-Holstein as well as Berlin and Brandenburg form one MRB, respectively).

Figure 2: Federal states coefficients

a) Second stage (Table 3): Care quality



b) First stage (Table 2): price



Federal states point estimates (dots) and confidence intervals (lines) from model (2), Table 3 and first-stage estimates from model (1), Table 2 all controlling for the full set of regional characteristics, instrumented price (only in panel a)) and year of evaluation.

PREVIOUS DISCUSSION PAPERS

- 208 Herr, Annika and Hottenrott, Hanna, Higher Prices, Higher Quality? Evidence From German Nursing Homes, January 2016.
Forthcoming in: Health Policy.
- 207 Gaudin, Germain and Mantzari, Despoina, Margin Squeeze: An Above-Cost Predatory Pricing Approach, January 2016.
Forthcoming in: Journal of Competition Law & Economics.
- 206 Hottenrott, Hanna, Rexhäuser, Sascha and Veugelers, Reinhilde, Organisational Change and the Productivity Effects of Green Technology Adoption, January 2016.
Forthcoming in: Energy and Resource Economics.
- 205 Dauth, Wolfgang, Findeisen, Sebastian and Suedekum, Jens, Adjusting to Globalization – Evidence from Worker-Establishment Matches in Germany, January 2016.
- 204 Banerjee, Debosree, Ibañez, Marcela, Riener, Gerhard and Wollni, Meike, Volunteering to Take on Power: Experimental Evidence from Matrilineal and Patriarchal Societies in India, November 2015.
- 203 Wagner, Valentin and Riener, Gerhard, Peers or Parents? On Non-Monetary Incentives in Schools, November 2015.
- 202 Gaudin, Germain, Pass-Through, Vertical Contracts, and Bargains, November 2015.
Forthcoming in: Economics Letters.
- 201 Demeulemeester, Sarah and Hottenrott, Hanna, R&D Subsidies and Firms' Cost of Debt, November 2015.
- 200 Kreickemeier, Udo and Wrona, Jens, Two-Way Migration Between Similar Countries, October 2015.
Forthcoming in: World Economy.
- 199 Haucap, Justus and Stühmeier, Torben, Competition and Antitrust in Internet Markets, October 2015.
Forthcoming in: Bauer, J. and M. Latzer (Eds.), Handbook on the Economics of the Internet, Edward Elgar: Cheltenham 2016.
- 198 Alipranti, Maria, Milliou, Chrysovalantou and Petrakis, Emmanuel, On Vertical Relations and the Timing of Technology, October 2015.
Published in: Journal of Economic Behavior and Organization, 120 (2015), pp. 117-129.
- 197 Kellner, Christian, Reinstein, David and Riener, Gerhard, Stochastic Income and Conditional Generosity, October 2015.
- 196 Chlaß, Nadine and Riener, Gerhard, Lying, Spying, Sabotaging: Procedures and Consequences, September 2015.
- 195 Gaudin, Germain, Vertical Bargaining and Retail Competition: What Drives Countervailing Power?, September 2015.
- 194 Baumann, Florian and Friehe, Tim, Learning-by-Doing in Torts: Liability and Information About Accident Technology, September 2015.
- 193 Defever, Fabrice, Fischer, Christian and Suedekum, Jens, Relational Contracts and Supplier Turnover in the Global Economy, August 2015.

- 192 Gu, Yiquan and Wenzel, Tobias, Putting on a Tight Leash and Levelling Playing Field: An Experiment in Strategic Obfuscation and Consumer Protection, July 2015.
Published in: International Journal of Industrial Organization, 42 (2015), pp. 120-128.
- 191 Ciani, Andrea and Bartoli, Francesca, Export Quality Upgrading under Credit Constraints, July 2015.
- 190 Hasnas, Irina and Wey, Christian, Full Versus Partial Collusion among Brands and Private Label Producers, July 2015.
- 189 Dertwinkel-Kalt, Markus and Köster, Mats, Violations of First-Order Stochastic Dominance as Salience Effects, June 2015.
Published in: Journal of Behavioral and Experimental Economics. 59 (2015), pp. 42-46.
- 188 Kholodilin, Konstantin, Kolmer, Christian, Thomas, Tobias and Ulbricht, Dirk, Asymmetric Perceptions of the Economy: Media, Firms, Consumers, and Experts, June 2015.
- 187 Dertwinkel-Kalt, Markus and Wey, Christian, Merger Remedies in Oligopoly under a Consumer Welfare Standard, June 2015
Forthcoming in: Journal of Law, Economics, & Organization.
- 186 Dertwinkel-Kalt, Markus, Salience and Health Campaigns, May 2015
Forthcoming in: Forum for Health Economics & Policy
- 185 Wrona, Jens, Border Effects without Borders: What Divides Japan's Internal Trade?, May 2015.
- 184 Amess, Kevin, Stiebale, Joel and Wright, Mike, The Impact of Private Equity on Firms' Innovation Activity, April 2015.
Forthcoming in: European Economic Review.
- 183 Ibañez, Marcela, Rai, Ashok and Riener, Gerhard, Sorting Through Affirmative Action: Three Field Experiments in Colombia, April 2015.
- 182 Baumann, Florian, Friehe, Tim and Rasch, Alexander, The Influence of Product Liability on Vertical Product Differentiation, April 2015.
- 181 Baumann, Florian and Friehe, Tim, Proof beyond a Reasonable Doubt: Laboratory Evidence, March 2015.
- 180 Rasch, Alexander and Waibel, Christian, What Drives Fraud in a Credence Goods Market? – Evidence from a Field Study, March 2015.
- 179 Jeitschko, Thomas D., Incongruities of Real and Intellectual Property: Economic Concerns in Patent Policy and Practice, February 2015.
Forthcoming in: Michigan State Law Review.
- 178 Buchwald, Achim and Hottenrott, Hanna, Women on the Board and Executive Duration – Evidence for European Listed Firms, February 2015.
- 177 Heblich, Stephan, Lameli, Alfred and Riener, Gerhard, Regional Accents on Individual Economic Behavior: A Lab Experiment on Linguistic Performance, Cognitive Ratings and Economic Decisions, February 2015
Published in: PLoS ONE, 10 (2015), e0113475.
- 176 Herr, Annika, Nguyen, Thu-Van and Schmitz, Hendrik, Does Quality Disclosure Improve Quality? Responses to the Introduction of Nursing Home Report Cards in Germany, February 2015.

- 175 Herr, Annika and Normann, Hans-Theo, Organ Donation in the Lab: Preferences and Votes on the Priority Rule, February 2015.
Forthcoming in: Journal of Economic Behavior and Organization.
- 174 Buchwald, Achim, Competition, Outside Directors and Executive Turnover: Implications for Corporate Governance in the EU, February 2015.
- 173 Buchwald, Achim and Thorwarth, Susanne, Outside Directors on the Board, Competition and Innovation, February 2015.
- 172 Dewenter, Ralf and Giessing, Leonie, The Effects of Elite Sports Participation on Later Job Success, February 2015.
- 171 Haucap, Justus, Heimeshoff, Ulrich and Siekmann, Manuel, Price Dispersion and Station Heterogeneity on German Retail Gasoline Markets, January 2015.
- 170 Schweinberger, Albert G. and Suedekum, Jens, De-Industrialisation and Entrepreneurship under Monopolistic Competition, January 2015
Published in: Oxford Economic Papers, 67 (2015), pp. 1174-1185.
- 169 Nowak, Verena, Organizational Decisions in Multistage Production Processes, December 2014.
- 168 Benndorf, Volker, Kübler, Dorothea and Normann, Hans-Theo, Privacy Concerns, Voluntary Disclosure of Information, and Unraveling: An Experiment, November 2014.
Published in: European Economic Review, 75 (2015), pp. 43-59.
- 167 Rasch, Alexander and Wenzel, Tobias, The Impact of Piracy on Prominent and Non-prominent Software Developers, November 2014.
Published in: Telecommunications Policy, 39 (2015), pp. 735-744.
- 166 Jeitschko, Thomas D. and Tremblay, Mark J., Homogeneous Platform Competition with Endogenous Homing, November 2014.
- 165 Gu, Yiquan, Rasch, Alexander and Wenzel, Tobias, Price-sensitive Demand and Market Entry, November 2014
Forthcoming in: Papers in Regional Science.
- 164 Caprice, Stéphane, von Schlippenbach, Vanessa and Wey, Christian, Supplier Fixed Costs and Retail Market Monopolization, October 2014.
- 163 Klein, Gordon J. and Wendel, Julia, The Impact of Local Loop and Retail Unbundling Revisited, October 2014.
- 162 Dertwinkel-Kalt, Markus, Haucap, Justus and Wey, Christian, Raising Rivals' Costs through Buyer Power, October 2014.
Published in: Economics Letters, 126 (2015), pp.181-184.
- 161 Dertwinkel-Kalt, Markus and Köhler, Katrin, Exchange Asymmetries for Bads? Experimental Evidence, October 2014.
Forthcoming in: European Economic Review.
- 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.
Published in: Economics Letters, 125 (2014), pp. 223-225.

- 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. Published in: International Review of Economics Education, 17 (2014), pp. 85-97.
- 156 Haucap, Justus, Heimeshoff, Ulrich and Lange, Mirjam R. J., The Impact of Tariff Diversity on Broadband Diffusion – An Empirical Analysis, August 2014. Forthcoming in: Telecommunications Policy.
- 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. Forthcoming in: Journal of Product Innovation Management.
- 153 Hottenrott, Hanna and Lawson, Cornelia, Flying the Nest: How the Home Department Shapes Researchers' Career Paths, July 2015 (First Version July 2014). Forthcoming in: Studies in Higher Education.
- 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. Published in: Applied Economics Letters, 22 (2015), pp. 1150-1153.
- 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.
- 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. Forthcoming in: Canadian Journal of Economics.
- 147 Gaudin, Germain and White, Alexander, On the Antitrust Economics of the Electronic Books Industry, September 2014 (Previous Version 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.
Published in: Journal of Institutional and Theoretical Economics (JITE), 171 (2015), pp. 666-695.
- 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.
Published in: Journal of Conflict Resolution, 59 (2015), pp.1273-1300.
- 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.

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