

ZEW policy brief

By Associate Prof. Dr. Franz Hackl, University of Linz (JKU); Michael Kummer, Centre for European Economic Research (ZEW); Prof. Dr. Rudolf Winter-Ebmer, University of Linz (JKU); Prof. DI Dr. Christine Zulehner, University of Linz (JKU)

Entry, Exit, and Pricing Strategies at Online Price-Comparison Sites: Do Price Markups Fall by Themselves, or Is Competition Crucial?



Essential Issues

The aim of this project is to investigate the competitive behaviour of e-commerce firms over the course of the product lifecycle for consumer electronics such as digital cameras, IT hardware, and smartphones. We combine data from Austria's largest online price comparison site with retail data provided by an industry-specific price comparison site for consumer electronics. This aggregated database enables us to record firms' input prices as well as to monitor the various moves each firm makes with regard to strategic market entry and pricing for hundreds of product markets. Insight into e-tailers' market behaviour is key to understanding online markets, which are reaping an ever greater share of retail sales each year. Yet antitrust and regulatory authorities are also interested in knowing how many firms are needed to sustain competition within a market, for merger assessments focus in part on the expected relation between the number of firms in a given market and corresponding market outcomes, i.e. product price and quality. Clearly, questions related to competition and pricing are of central importance to society and the public, as a minimum level of competition is needed to ensure sufficient supply of a product at reasonable prices.

Research Question and Relevance

Our research attempts to understand what factors influence a firm's decision to enter the market at a particular point in time. When devising a listing strategy, e-tailers must choose to either list the entire available product line from the start or slowly and carefully select which items to roll out and when. A difference in strategy typically results in a difference in markups. Analysis of the link between market structure and market performance is crucial to the study of industrial organization. Moreover, an understanding of factors that influence retailers' markup decisions is key to a further understanding of the behaviour of online markets, which year after year continue to reap an ever greater share of retail sales. Our findings reveal, first, that the lifecycle of an online product is rather short, typically less than one year; and second, that the number of firms competing to offer a product significantly affects the markup in price for that product. Many suppliers will enter the market only after the success of a product has been established, thus driving down markups and increasing consumer benefit. This is a sign of healthy online competition and ensures that surplus is transferred to the consumer.

Key Messages

Research Question and Relevance

Firm Strategies and Market Structure

Our research objectives narrow in on two particular issues. The first has to do with marketplace entry/exit decision-making, and the second then considers the resulting market structure over the product lifecycle. Whereas our analysis of entry/exit strategies, including their determinants and profitability, focuses on decisions made at the level of an individual firm, our analysis of market structure and prices takes place at the market level.

Timing Decisions

Our research attempts to understand why shops make the timing decisions they do with respect to entering and exiting the market. When devising a listing strategy, e-tailers face a fundamental trade-off: immediate listing of all products comes with the advantage of being a first-mover in top-selling products; this advantage may, however, come at the cost and therefore the risk of handling a highly diversified and more expensive portfolio. Hence, some shops might prefer to watch and wait for certain market signals, and then only later choose to enter more promising markets.

Impacts on Price Setting

Furthermore, we investigate what impact the number of sellers has on price and price dispersion. An awareness of the impact that market structure exerts on price setting and price dispersion helps us to evaluate the applicability of conflicting economic theories. The novelty of our research is two-fold. First, considering the rapidly fluctuating appearance and disappearance of firms in the e-tail market, this shortened lifespan allows us a more comprehensive analysis of the impact of market structure over time, thus resulting in critical insight into market dynamics. Second, given that the order of entry into the market is clearly laid out in the listing decisions e-tailers make, we are able to exploit this obvious structure in order to elucidate a straightforward instrumental variable strategy designed to estimate the impact of market structure on performance (prices, dispersion, etc.). In all markets, but in the e-tail market in particular, it is important to treat market structure as endogenous: because entry into the market and exit from it are relatively simple and low-cost, e-tailers are able to adapt quite easily to changing circumstances simply by listing a particular product at a particular time. Thanks to the long-term data available at www.geizhals.at, Austria's largest price comparison site, we can examine markets for brand-name products. Our aim is to better understand the role of market structure – i.e., the number of firms in a given market, the size of each firm, and the products each of them offers – in determining the extent of market competition and market performance.

Healthy Competition

Antitrust and regulatory authorities are particularly interested in knowing how many firms must exist in a market in order to sustain healthy competition since at the core of merger assessments lies the expected relation between the number of firms competing in the market and market outcomes, such as product quality and price. These considerations are of central importance to the public as well, given that a minimum level of competition ensures both: sufficient supply of the product and reasonable prices for the consumer.

Methods and Database

Extensive Database

Our project team has access to an extensive database maintained by Austria's largest price comparison site. Our aim is to analyze the strategic interaction of online shops and how this interaction relates to a given stage in a product's lifecycle – or, in other words, the dynamics of strategic interaction among firms from the time of a product's emergence on the market to the point of its disappearance. The www.geizhals.at database enables us to record firms' input prices as well as to monitor the various moves each firm makes in the market entry and the pricing game for hundreds of product markets. The data is directly accessible via the company's web servers and is thus made available in unprecedented detail: Prior to our analysis, we tracked more than 320 million price offerings for more than 370,000 products from a total of 3,700 sellers over the course of more than

three years. These offerings include information on product availability and shipping charges as well as customer reviews of quality and service on a 5-point scale. Approximately 100 million customer clicks were tallied.

Furthermore, having been provided with additional information directly from a major manufacturer, we were in a rather unique position to merge these two data sets to get a detailed view of the retailers' cost structure. When taken together with the information on clicks¹ from www.geizhals.at, we were able to approximate e-tailers' input/output cost margins with unprecedented accuracy.

The primary advantage to studying trends in e-commerce is the easy availability of large amounts of data on retail prices at very little cost to the researcher. Moreover, it is generally possible to observe all prices and changes in the price set that are made by participating firms and to reconstruct the series of reactions the firms are making in response to one

another. Beyond even this, data on e-commerce is available for a great variety of markets ranging from books to consumer electronics. However, the key drawback researchers face is that they cannot always observe the entire marketplace, rather only a segment of it. Often they are unable to assess whether or not a posted price has also resulted in an actual consumer transaction.

This paper represents a significant contribution to the study of e-commerce in that it offers a novel way of accounting for the fact that it is extremely easy for online shops to add and remove items from their product portfolio.

This phenomenon tends to complicate analysis, since the number of shops offering a product typically corresponds to the attractiveness, which is to say the saleability of that product; thus the number of shops offering a product will depend precisely on the variables we seek to explain. This situation is an example of the "endogeneity problem", which can pose a threat to the validity of empirical estimates. We have

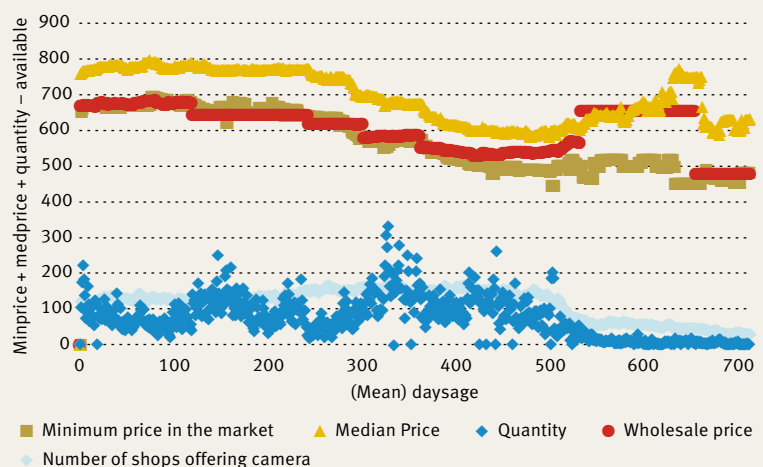
chosen to deal with this issue by taking an historical look at how many shops typically listed their earlier products at a particular point in the product lifecycle. These variables capture overarching factors in the listing decision (e.g. distribution patterns) that cannot so easily be changed and are therefore immune to issues such as whether an item is currently en vogue or not. Tracking a set of 104 digital cameras, we illustrate our solution to the endogeneity problem.

Research Results in Detail

We find that a firm's markup over input price is significantly and strongly affected both by a very short product lifecycle, usually less than a year, as well as by the number of firms competing to sell that product. Ten additional competitors in the market will reduce the markup by the cheapest firm by an average of more than 1.5 percentage points.

A Typical Lifecycle in Retailing

Pricing Strategies and Number of Sellers Over the Lifecycle of a Single Product



The figure shows the lifecycle of a very long lasting (700 days) camera in our dataset. The yellow line shows the price of the median shop. 50 per cent of the shops asked a higher and 50 per cent asked a lower price. The red line shows the wholesale price and the brown line the price of the cheapest shop in the market. The wholesale price is close to 700 (Euro) when the camera was introduced for the first time and then gradually fell to just below 600 Euro after 300 days. The dark blue line shows the number of daily clicks that the camera received on geizhals.at. It typically fluctuated between 50 and 150 clicks with peaks above 200 (typically when the wholesale price was decreased). The light blue line, finally shows the number of shops in the market: For that camera the number increases to about hundred shops over the first days and then slowly increases to 150 after 400 days. The number of shops is reduced to merely 50 between day 450 and 500 of the camera's life, but it is hardly ever clicked after that point in time.

Impact of Product Lifecycle and Number of Firms

¹ We observe "referral requests", which are registered whenever a customer clicks on an offer and is referred to the shop's website. From these we can also generate "Last Click Throughs" (henceforth LCT), which are usually more closely correlated to actual purchases.

This effect is felt most strongly within the first month that a product enters the market and then again at the end of the product lifecycle. When differentiating among effects of market structure over the full lifecycle of a product, we find a negative impact on markup throughout. This impact is especially pronounced in the beginning and the late phases of the lifecycle, though interestingly, markups were found to be at their lowest in months 2 to 4, precisely when the number of competing firms seems to be the lesser determinant in decreasing price to the consumer. Our results refer to e-tailing associated with a price-comparison search engine with very narrowly defined product parameters. In such a situation, consumers are very easily able to obtain information about prices and seller reliability. Nevertheless, it takes a large number of sellers and a relatively long period of time for markups to decrease substantially.

Advantage of Waiting

The price leader's markup also diminishes over the lifecycle of the product. This trend allows us to compare the effect of the number of firms in competition with the effect of time on product markup. Should a consumer wait longer to purchase a product, the number of competing firms offering that product will generally increase; thus there is an advantage to waiting. All else remaining equal, should the consumer wait three additional weeks, she can expect to receive the same reduction in price that she might otherwise get by participating in a market with one additional competing firm.

Lastly, customer reviews have proven to be an important and valuable source of information with respect to the reliability of online shops. Thus, a guarantee of the accuracy and reliability of tools designed to measure and mark customer satisfaction can help to ensure the efficient function of online markets.

Project Profile

Research Team

- ▶ Associate **Prof. Dr. Franz Hackl** (University of Linz, Department of Economics)
- ▶ **Michael Kummer** (Centre for European Economic Research (ZEW), Information and Communication Technologies Research Group)
- ▶ Prof. Dr. **Rudolf Winter-Ebmer** (University of Linz, Department of Economics)
- ▶ Prof. DI Dr. **Christine Zulehner** (University of Linz, Department of Economics)

Contact

Michael Kummer, E-mail: kummer@zew.de

Funding

The research program "Strengthening Efficiency and Competitiveness in the European Knowledge Economies (SEEK)" is funded by the German state of Baden-Württemberg.

Publications

Hackl, Franz, Michael Kummer, Rudolf Winter-Ebmer and Christine Zulehner (2011), Market Structure and Market Performance in E-Commerce, ZEW Discussion Paper No. 11-084, Mannheim.

Website

<http://seek.zew.eu/seek/projekte-2010/wettbewerbsstrategien-ueber-den-produktlebenszyklus-markteintritt-austritt-und-preissetzung-auf-online-preisvergleichseiten.html>



Zentrum für Europäische
Wirtschaftsforschung GmbH
Centre for European
Economic Research

ZEW policy brief series

Publisher: Centre for European Economic Research (ZEW), Mannheim
L 7, 1 · 68161 Mannheim · P.O. Box 10 34 43 · 68034 Mannheim · Germany · Internet: www.zew.de · www.zew.eu
President: Prof. Dr. Clemens Fuest · **Director of Business and Administration:** Thomas Kohl

Editorial responsibility: Prof. Dr. Clemens Fuest

Quotes from the text: Sections of the text may be quoted in the original language without explicit permission provided that the source is acknowledged.

© Zentrum für Europäische Wirtschaftsforschung GmbH (ZEW), Mannheim, 2013