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## International Journal of Industrial Organization

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# Measuring the competitive impact of the internet: Evidence from a natural experiment in broadband access<sup>☆</sup>



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### ARTICLE INFO

#### Article history:

Received 28 July 2015

Revised 22 December 2017

Accepted 25 December 2017

Available online 9 January 2018

#### JEL classification:

D43

L81

L13

#### Keywords:

Internet

Market structure

Differences in differences

### ABSTRACT

To identify the competitive effect of online competition, I exploit that consumers in some German municipalities lack broadband access due to legacy glass fibre cables. In these areas with reduced online competition, I find that offline employment in electronics retailing grows faster than in the control areas. I find no such differential for food retailing, where there is no online competition. Full broadband access reduces employment growth in electronics relative to food retailing by 1.1% per year from 1999 to 2007. I find no significant effect for book retailing, which is shielded from retail price competition by law.

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<sup>☆</sup> I would like to thank Oliver Goretzki for the data on glass fibre cables, the team at the *FDZ* of the *Bundesagentur für Arbeit* for the excellent handling of the remote data access, and Jan Göbel for the support at the *DIW*. Moreover, I would like to thank Giacomo De Giorgi, Stefano DellaVigna, Peter Egger, Nicola Fuchs-Schündeln, Patrick Legros, Klaus M. Schmidt, Konrad Stahl, Fabian Waldinger, Mark Williams, Joachim Winter and the participants at the “8th SFB-Conference in Munich/Frauenchiemsee” and the “Workshop Natural Experiments and Controlled Field Studies” in Holzhausen. Financial support by *Deutsche Forschungsgemeinschaft* through grant *SFB TR 15* is gratefully acknowledged.

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## 1. Introduction

Small search costs, no geographical differentiation, and low barriers to entry — the frictionless internet economy should force down prices and drive bricks-and-mortar retailers out of business. Yet, the internet economy has also spawned deliberate obfuscation, new forms of product differentiation, and an increased role for reputation — all factors that soften competition. In this paper, I attempt to quantify the balance of these effects on competition. Quantifying the competitive impact of the internet is central to our understanding of frictions in markets; it is also a key issue in policy discussions, such as government interventions in broadband markets or antitrust policy towards mergers.<sup>1</sup>

I measure the competitive impact by changes in retail employment: if online retailers reduce the producer rents of offline retailers, some retailers must leave the market, and some of the employees must find new jobs outside the industry. For identification, I exploit that consumers have only limited broadband access in some regions of Germany, as Deutsche Telekom made a short-sighted choice of technology in the early 90s. In these regions, I find that employment in electronics retailing expands relative to the rest of Germany; employment in food retailing does not. As employment in electronics and food retailing is affected by the same factors with the exception of online competition, I interpret the electronics-food employment growth differential as the impact of online competition: It is approximately 1.1 percentage points per year. To confirm that this loss results from price competition, I exploit that legally mandated resale price maintenance prevents retail price competition in the German book trade. I repeat the analysis for book versus food retailing and do not get a significant differential. I conclude that online *price* competition has a large competitive effect, online competition per se does not.

Every year “Deutsche Telekom”, the erstwhile German telecommunication monopoly, replaces worn out cables with new ones, using the newest and best, available technology at the time. In the early 90s, the best technology was thought to be glass fibre cables. When, beginning in July 1999, Deutsche Telekom rolled out a new broadband data transmission technology, Digital Subscriber Line (DSL), it realized that it could not upgrade the glass fibre cables to DSL. To provide DSL anyway, Deutsche Telekom essentially has to replace the glass fibre cables with copper cables. It started the replacement in late 2003, but proceeded so slowly that towards the end of 2008 most areas with glass fibre cables still waited to get a DSL connection. In the glass fibre areas households use the internet less than in the rest of Germany, as data show (see [Section 2.1](#)). Retailers are less affected, as they often use a dedicated line, which is available even in glass fibre areas.

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<sup>1</sup> Examples of merger cases in which internet competition played a major role are ‘HMV Group plc / Waterstone’s plc / Ottakar’s plc’ ([Competition Commission, 2006](#)) and ‘Game Group PLC and Games Station Limited’ ([Competition Commission, 2008](#)). A prominent example for an intervention to promote broadband internet is the broadband program of the the Obama White House ([The White House, Office of the Press Secretary, 2009](#)).

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