

Research Statement

michael.kummer@gess.uni-mannheim.de, <https://sites.google.com/site/kummermannheim>

My *fields of research* are Empirical Industrial Organization, Applied Econometrics and Applied Microeconomics. I focus on the economic consequences of reduced transaction costs due to better Information and Communication Technologies (ICT). Specifically, I have studied electronic commerce and citation networks in knowledge based peer production. Both phenomena highlight the potential of new ICT to trigger societal transformations, by allowing remotely located partners to coordinate and resolve complex tasks or to jointly store information and develop knowledge. These dynamics will soon affect many other economic sectors. My *specific research approach* is to gather and analyze big and novel data on digitally recorded online activities, which facilitate careful identification based on innovative instruments or easy to communicate pseudo-experimental strategies.

To analyze **networks in knowledge-based peer-production** I study the production patterns on the German Wikipedia. “Peer production” refers to multiple agents coordinating via an online platform to organize and distribute work, because they wish to achieve a large goal. Under this new production regime highly valuable and complex services, such as Open Source Software or Wikipedia have been produced. In two papers, I study a specific aspect: how the hyperlinked citation network between Wikipedia’s articles influences users’ search and contribution behavior.

My Jobmarket Paper is entitled “Spillovers in Networks of User Generated Content - Pseudo-Experimental Evidence on Wikipedia.” I focus on the challenge of quantifying spillovers or peer effects in the face of endogenous network formation. This problem can be circumvented if one can find or create exogenous changes in a network structure. I find such exogenous variation in the setting of German Wikipedia, which prominently advertises a featured article on its main site every day. The added exposure exogenously increases viewership of this article, while shifts in the viewership of adjacent articles are likely due to their link from the treated article. Through this approach I isolate how the link network causally influences users search and contribution behavior. I estimate how attention spills to neighbors through these transient shock in a difference-in-differences analysis. I further develop an extended peer effects model which relaxes the requirement of exogenously given networks to allow estimating the underlying spillover. Advertisements affect neighbors substantially: They increase views on neighbors by almost 70 percent. This, in turn, translates into increased editing activity. A second paper “Centrality and Content Creation in Networks The Case of German Wikipedia” focuses on the role of an article’s network position on contribution patterns.¹ Both papers uncover a relevant aspect of peer produced content networks: The coauthored work highlights the importance of local semantic structures. The job market paper builds on these insights to precisely quantify how much attention spills across links and to point out the crucial role of a high visiting frequency for the success of this type of public good production.

A second line of my research is related to electronic commerce and **online markets**. In E-Commerce, several important transaction costs that used to be borne by one of the two sides, are no longer important. Shops can economize on store maintenance and consumers are now free to order any time and without leaving their house. Most importantly, consumers can compare many prices much faster and more easily. However, the question arises, how shops can continue to make a profit on such a site. In two papers, my coauthors and I study firms’ strategies on Austria’s largest price comparison site, *www.geizhals.at*.

In a published paper on “Market Structure and Market Performance in E-Commerce”² we analyze how the interaction between market structure and market performance varies over the product cycle. To account for the potential endogeneity in this relation, we use a novel instrumental variable approach. We furthermore investigate the relationship of market structure and price dispersion. We combine data from *geizhals.at* with retail data on wholesale prices. One more firm in the market reduces the price leader’s markup as much as three additional weeks in the product life cycle. Our results support search theoretic models, contradict models of monopolistic competition and support the existence of price dynamics over the product cycle. They also highlight variations in the substitutability between newly innovated and old expiring technologies.

¹The paper is coauthored with Marianne Saam, Iassen Halatchliyski and George Giorgidze. It is available as discussion paper at <http://ftp.zew.de/pub/zew-docs/dp/dp12053.pdf>

²Hackl, Franz, Michael E. Kummer, Rudolf Winter-Ebmer and Christine Zulehner (2014), Market Structure and Market Performance in E-Commerce, *European Economic Review* 68, 199-218.

In “99 Cent: Price Points in E-Commerce”³ we analyze the phenomenon of quoting prices that end in a special ending (e.g. “.99c”). The papers both show that certain phenomena which would be expected to disappear in online markets continue to exist. Shops might hence be able to continue making small profits as a consequence of specific behavioral patterns, such as rounding down a price that ends in “.99c”.

Ongoing Work and Research Agenda: During my stay at NBER, I would plan to build on my dissertation and expand its focus. I would like to publish my Job Market Paper (at least submit it), and I would like to continue analyzing the interaction of *knowledge-based peer production* settings with real world outcomes. This should be based on a joint research project with P. Gloor, M. Hinnosaar, T. Hinnosaar, O. Slivko and M. X. Zhang.⁴ We are investigating how peer production is affected by outside factors, such as unemployment, and conversely, how Wikipedia can affect real world outcomes or influence human decision making. Moreover, I would like to take the methodology developed in my jobmarket paper to other networks (e.g. scientific citation networks). Specifically, we would like to study how patent citations influence future research efforts (jointly with O. Slivko and M. Ward). Patent citations, like articles on Wikipedia, are prone to endogeneity issues and analyze attention spillovers due to citations of scientific papers.

Ongoing work (with Patrick Schulte) on *Online Markets*, studies the role of privacy in the market for mobile applications. Such programs for smartphones and tablet PCs have become a very important market. Yet, little is known about the role of privacy concerns in the usage of mobile devices. This is surprising, given that online markets depend on how much users trust both the platform and the suppliers. We exploit data on 300,000 mobile applications and almost 1,000 applications-pairs” to analyze both sides of this market: First we analyze the price that application suppliers offer for more privacy. Second we study how users’ installations relate to the data greediness” of a mobile application. In a second project (with O. Slivko and I. Yamchikov) we analyze a large price comparison site in Russia. We plan to exploit institutional changes and Russia’s large geographical distances to analyze competition and non-monetary frictions (e.g. trust) in geographically isolated markets in unprecedented detail. Our results will provide policy relevant insights into remaining market frictions and the sources of market power in online markets.

I believe that the importance of understanding ICT-enabled technologies for searching and documenting information cannot be overstated. While my research, so far, has focused on two important but specific aspects, these technologies have only begun to transform many other areas. This is because the process of building, documenting and transferring knowledge is characterized by enormous frictions: Transmitting ideas has always been extremely costly, involving face to face interaction or a media for storing knowledge and a lot of time. Moreover, the successful transmission of knowledge is not guaranteed: New and even existing knowledge can be inaccurately disfigured (and even lost), if it is not sufficiently documented. However, a civilization’s knowledge and its innovations have always been a fundamental input to its productivity. The success of a culture depends on how well an economy can create new knowledge or transmit the existing one to the public and to future generations. Thus, many resources needed to be devoted to the generation and transfer of knowledge, often involving an entire sector of a civilization’s economy. The new ICT are valuable whenever information or knowledge have to be stored and retrieved in an organized way, be it complex joint projects, writing scientific papers, managing a production chain or handling an entire organization.

Peer produced Wikipedia was a first showcase, where thousands of volunteers took only a decade to collect, digitize and document virtually all encyclopedic knowledge in unprecedented detail. It highlights how ICT-enabled reductions of transaction costs could transform the societal process of knowledge generation, documentation and transmission. Such developments are likely to have deep and long lasting effects on education and innovation. Similar processes in other areas are transforming organizational structures, marketing strategies, the labor market or production. Moreover, this ongoing revolution is also a research opportunity, because on top of being a historic moment, all these facets of human behavior are now being recorded for the first time. The repertoire of research techniques that I acquired in my Ph.D. can be fruitfully applied to also address other pressing questions in innovation, areas of competition policy, human decision making or for analyzing the success of organizations. The increased availability of data and the drastic structural changes of markets, innovation and competition will bear daunting challenges but even greater promise for the decades to come. Answering the ensuing research questions will require carefully designed empirical economics.

³Hackl, Franz, Michael E. Kummer and Rudolf Winter-Ebmer (2014), 99 Cent: Price Points in E-Commerce, *Information Economics and Policy* 26, 12-27.

⁴<http://seek.zew.eu/en/seek/projects/ict-research-group/projekte-2014/side-effects-of-economic-crises-in-europe-and-provision-of-online-public-goods.html>