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Letter of recommendation for Michael Kummer

Michael Kummer has applied for a position at your department and it is a pleasure for me to support his application. Michael has finished his Ph.D. already this summer since he has been very productive. I have been his main advisor.

Michael has already produced substantial research and has a number of very promising projects. He has progressed much more than what is typical for a researcher at this stage. He started with rather modest ambitions, as his first two publications show; one of them has been published in the European Economic Review and the other in Information Economics and Policy. Michael has developed into a strong and ambitious empirical researcher addressing interesting economic questions related to electronic commerce and knowledge creation and diffusion. He has strong skills in handling and analyzing large data sets and interacts well with more theory-oriented researchers in economics as well as with researchers in information systems and informatics.

I know Michael very well. I am his supervisor and we have been meeting mostly on a weekly basis. Also, three times he has been a TA for my course in industrial organization.

In his job market paper with the title "Spillovers in Networks of User Generated Content –Pseudo-Experimental Evidence on Wikipedia" Michael investigates the link between attention and content creation in peer production. To this effect, Michael uses data from the German Wikipedia. Michael observes the network formed by articles on Wikipedia as nodes of the network and the hyperlinks between articles as the directed links in the network. Michael observes the (evolving) network structure, characteristics of articles, page clicks per day, and the number of article revisions. Note that absent exogenous shocks attention and content creation are jointly observed. If an article receives a lot of attention (many clicks) and undergoes a number of revisions it is in general not clear what is the difference compared to another article which received less attention and a small number of revisions. For instance, if an article topic is undergoing quick changes, this stimulates both more attention and more content generation and the additional attention cannot be seen as causal for additional content generation.

The approach taken by Michael is to exploit the network structure and to consider exogenous variations of attention. By looking at the link structure in the network, this allows him to establish attention spillovers from one article to neighboring articles in the network. In addition, to the extent that the

variation in attention is exogenous, this will allow him to identify the effect of additional attention on content creation. The cleanest way this is done is by considering "feature articles" which shift attention to specific articles in the universe of Wikipedia. Such a featured article is shown to viewers who enter the starting page of Wikipedia. Michael considers 93 such events. As can be expected, a featured article receives a lot of attention. This attention spills over to neighboring articles as viewers sometimes click on hyperlinks of interest. Michael then considers the effect of additional attention on content creation, i.e. the revision of articles which may involve corrections and the provision of additional material.

To estimate the effect of a featured article, Michael makes use of the control treatment literature. Of particular interest is the indirect treatment effect which measures the spillover of treatment on neighboring nodes (of course, not only direct neighbors, but also nodes further removed from the treated node can be considered). Michael also quantifies the spillovers of attention that exist absent of shocks making use of the exogenous shock to identify the spillover effect (taking higher-order spillover effects into account). If there is only limited information on the link structure, Michael also derives upper and lower bounds of the spillover. With respect to content generation, Michael than finds that treatment of an article increases revisions of any neighboring article by around 70%. Thus, the treatment not only affects the treated node but also strongly affects neighboring nodes. This suggests that Wikipedia could strategically use featured articles to increase content generation in areas in which it sees need of improvement; such a policy is not only useful for a particular article but affects also articles in the vicinity of the treated article. While the qualitative results are not surprising, quantifying attention spillovers as well as content generation in response to additional attention is an important contribution.

Content creation on the leading online encyclopedia is an interesting topic in itself. However, insights are of broader interest as they are of general interest for peer production. The paper shows the large set of skills Michael has acquired that allows him to develop an econometric specification, build up and handle a large dataset, and describe the data in a meaningful way. This is an impressive piece which, after some work, has a good shot at a leading economics or management journal, including a top 5 journal in economics.

In a second paper, together with three co-authors, Michael analyzes the relation between network position in the Wikipedia network and content creation. Here, the idea is that the way content is organized (links structure in the network of articles) affects the decision of potential contributors whether and where to contribute. Possibly, when being guided by hyperlinks the centrality of a particular article matters. To address this hypothesis the authors track a set of articles over roughly three years. In this panel of Wikipedia articles the link structure changes over time. The authors find that an additional directed link towards an article is associated with an increase of the number of contributors to the article and an increase of about one to two words. However, when distinguishing whether the links comes from an article within the same category of the article in question, the coefficient for links coming from outside the category is insignificant. This suggests that additional links generate more content if these links are within the category. A possible explanation is that additional links from outside the category channel attention to the article of those users who tend to lack expertise on the category and thus are unlikely to contribute to the article. While there remain some endogeneity issues, this is an article which should be of interest to people interested in the functioning of networks and the role of networks in peer production.

In a third paper, together with three co-authors, Michael investigates the relationship between number of firms in a product category and their pricing behavior, conditioning on the the phase in the product cycle. They are able to observe markups because, in addition to posted retail prices, they also observe wholesale prices. They use price and listing data for consumer electronic products from the Austrian price comparison site geizhals.at. Since there is a lot of innovation in this product segment, they are able to investigate product life cycle effects. Retailers have to decide whether to list for a certain product and, if they do so, they have to post a price.

In their initial OLS regressions the authors regress the markup for each product at each point in time (they use the minimum markup and the median markup) on, among others, the age of the product to capture product life cycle effects and the number of firms in the market. They allow for a non-linear relationship in these two variables and control for product and calendar-time fixed effects. In addition to levels, they also take several price dispersion measures as explanatory variables. However, the OLS regressions suffer from the problem that the number of firms and markups are jointly determined. For instance, if market

conditions look favorable (which is unobserved by the econometrician) this may lead to high markups and a large number of firms. This would result in an upward bias of the estimation.

To address the endogeneity problem with respect to the timing decision by retailers over the product life cycle, the authors use a novel instrumentation strategy. They use the timing along the product life cycle of previous listing decisions of retailers selling other branded products of the same manufacturer as an instrument for current listing decisions. By including product-specific fixed effects in the IV regressions, the IV regression analysis only exploits the variation of markups over the life cycle of individual products.

The authors find a statistically and economically significant effect of the number of firms on markups: 10 additional retailers tend to reduce the markup by more than 1 percent. While this number may not look large, taking into account that the standard deviation of firms is 57 in the sample, this number is large. Concerning product life cycle effects, markups decrease with time. In contrast to the OLS estimation, the IV estimation show that price dispersion (measured by the coefficient of variation) increases in the number of firms. As the authors argue, these findings are compatible with some oligopoly models of consumer search.

This article is an interesting empirical reduced-form investigation which documents the relationship between the number of active firms and markups, enriched by product life cycle findings. The paper has been published in the European Economic Review.

In a fourth paper, together with two co-authors, Michael investigates the role of focal prices in e-commerce markets. As postulated in a previous theory paper by Basu, consumers may rationally disregard the right-most digit of the price of the product since this involves information processing costs. Then, firms will use prices ending with 9 in its last digits. This would allow firms to obtain positive profits even in a pure Bertrand setting.

In the empirical analysis the authors track price listings over time. In particular, their data contains the duration of any price that is listed by a retailer. Given the motivation on focal prices, the hypothesis is that firms are less inclined to update a price if this price is focal. Hence, the survival time of focal prices should be larger than the survival time of non-focal prices. This hypothesis is confirmed by the data in the pooled analysis as well as in the stratified analysis with firm-specific hazard rates. One concern may be that the analysis contains also prices which are far above the lowest price and are therefore rather meaningless. As a response, the authors consider a subsample of only those retailers that set at some point the lowest price. In this subsample they find that focal prices are less likely to be undercut than non-focal prices.

Since the authors also have click data, they are also able to take a look at consumer behavior. In particular, they provide evidence that consumers disregard the last digits of the price of the product, in line with the theory by Basu. They also argue that their findings do not support the image effect theory as the only explanation, while they cannot rule out that also image effects are at work. The link to the theoretical literature is not fully worked out. Overall, the paper provides convincing evidence that focal prices are important in electronic commerce. The analysis cannot explain when firms choose focal and when non-focal prices and how price levels would be in the counterfactual world in which consumers take the full price into account. Thus, the paper succeeds in pointing out that some prices are focal; however, future research has to explore the competitive effects of focal prices. This paper has been published in Information Economics and Policy, which makes sure that researchers working on this topic will not overlook the paper.

Among his other ongoing project I would like to draw attention to a project that addresses how peer production is affected by observables such as unemployment. This is a project with a number of collaborators including Michael Zhang (HUST), which received outside funding and may lead to important results as we currently know very little about the factors affecting peer production.

In another project, together with a junior researcher at the ZEW, Michael studies the demand for (and supply of) privacy using data on 300,000 mobile applications and around 1,000 application pairs (which are offered by the same app provider and contain applications with the same features apart from the chosen privacy level). First, he investigates whether and to which extent consumers avoid an app that

requests access to more and more sensitive personal data (controlling for quality of the app and price). With respect to the business strategy chosen by the app provider side he investigates whether and to which extent apps are less intrusive if they come at a higher price, keeping the user value constant. This choice is driven by demand side features (substitution between price and the disutility from providing access to personal data) and supply side features, namely to which extent the app provider can monetize on personal data.

In both projects the questions are interesting and Michael has got interesting data, which hopefully can shed light on the addressed issues. This is clearly a good start and I am curious how the projects will develop.

To sum up, Michael has already two publications (however, some of his unpublished work is much stronger than these two published pieces) and an impressive list of ongoing projects. I believe that the first paper explained above, once it is polished, has a shot at a top 5 economics journal.

Michael is an innovative, hard-working and entrepreneurial researcher. He has the rare combination of skills that allows him to dig up interesting data, handle and analyze large datasets with state-of-the-art techniques and to address important research questions.

Michael has been at TA for three years for my course on industrial organization at the master level. He prepared well, showed a lot of initiative and was well liked by the students. I do not have doubts that Michael will be an effective teacher.

Being based at the Centre for European Economic Research (ZEW), Michael was part of several applied projects and involved in writing grant proposals. While this took some toll on his time available for research (which makes his output even more remarkable), it also gave him exposure to policy-oriented work, which may prove to be a valuable experience.

Michael applies broadly in terms of geography. I believe that he should be interviewed by research-oriented departments in economics and information systems. In my opinion all good to excellent departments interested in hiring an empirical microeconomist should seriously consider him. Michael will benefit from a stimulating and demanding research environment.

Please do not hesitate to contact me if you need some additional information.

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