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Application for NBER Digital Economics and AI Tutorial

I am excited to apply for the NBER Digital Economics and AI tutorial because my research explores how digital platforms and open-source ecosystems reshape firm behavior and labor markets. I am currently a job market candidate in finance at UT Austin and my current pipeline is focused on the economics of open-source software.

Course of Graduate Study and Years of Enrollment

I have completed the standard sequence for micro, macro, and metrics. In addition, not only have I completed the standard finance sequence of asset pricing theory and corporate finance theory, but I am also the TA for the PhD course on Economics of Information for William Fuchs and have previously been the TA for PhD asset pricing theory for Michael Sockin. Through Willie's papers on information and organizational economics (such as his papers with Luis Garicano), and Mike's papers on platform economics and labor, I have learned absorbed some digital economics. I also have a co-authored paper with Mike that is currently *revise & resubmit* at *AEJ: Microeconomics* with elements of digital platform management. I am currently a 6th year student and I am on the finance job market.

Research Interest

My job market paper is titled "Why Do Firms Engage in Open-Source Software?" and I am advised by John M. Griffin, Michael Sockin, and Aaron Pancost. My paper focuses on project choices of firms and workers. Open-source software development is the process where organizations share projects online with a public license and invite volunteers to make contributions. Volunteers, in turn, are motivated to contribute because it is a public signal of their ability and improves future career prospects. I focus on how this extends the theory of the firm by allowing firms to substitute between workers and volunteers. This is especially interesting because it is a very unconventional contracting framework where firms do not pay volunteers directly, and instead their incentives are in the form of higher wages from a future employer. I use task-level data from GitHub and a novel shock to VC financing to demonstrate that financially constrained firms tradeoff between hiring workers and posting more projects online. I demonstrate that workers earn higher future wages and are often hired after making open-source contributions. Firms thus provision signaling devices when

financially constrained. More public projects may appear to be good for workers; however, I find that worker quality declines and there are spillover effects to where signaling is less effective, or that even high-quality workers have lower likelihood of securing a job after signaling by volunteering at a treated firm. Overall, my paper thus frames open-source development as a financing mechanism for firms to allow them to continue to invest when constrained but with spillovers for workers. I also show there is a tight link between VC financing and their startups, which impacts both employees and non-employees. I rationalize these patterns in an assignment model where firms and workers self-select into open-source or closed-source projects.

My job market paper is available at my website: https://kevin-mei.com/

Looking ahead, I aim to contribute to discussions on platform design and digital innovation. This paper is the start of a broader agenda on studying how open-source software is an engine for growth, which is especially important given modern debates around innovation and sharing technology. Among potential follow-up ideas, one paper I am outlining focuses on how workers self-select the types of open-source projects where they are willing to invest their human capital after the introduction of coding assistants. In the data, I have documented that, unsurprisingly, code contributions have increased after the release of ChatGPT. However, I also see that the rate that code changes are accepted into projects has declined, suggesting there is potential self-selection of lower quality workers entering open-source software development. I hope to construct a careful model where firms can invest in open-source projects in the style of Acemoglu & Akcigit (2012) and Aghion, Harris, Howitt & John Vickers (2001), combined with self-selection of workers into types of projects.

In addition to my job market paper, I also have a portfolio of three papers about cryptocurrencies and exchange regulation. I am aware that NBER Digital Economics is not focused on cryptocurrencies, but I believe these papers are nevertheless relevant in my packet. First, in "A Theory of Speculation in Community Assets" with Michael Sockin, we write an asset pricing model and study how network effects in adopting technology interact with the ability to speculate on that technology. Normally, speculation can be useful because it allows market participants to discover the correct price of an asset. However, in technologies that require network effects and have a speculation token associated with its use, we show how speculation risk may reduce adoption. We model agents with a choice of speculation or adoption and are heterogeneous in their cost of adoption. The risk from speculation reduces incentives to adopt and we show how it can lead to learning traps for the platform. This paper is currently *revise & resubmit* at AEJ:Micro.

I have two additional papers on cryptocurrency about scams and anti-money laundering regulation. This series of papers started when a victim of a romance scam asked us to investigate the transaction patterns of his scammer. We have since gathered over 250,000 reports of scams, thefts, and hacks to follow the network of flows. As we explored how illicit activity can be mitigated, we have focused on the role of cryptocurrency exchanges and regulatory responses. In "Does Crypto Finance Slavery? The Economics of Pig Butchering", coauthored with John Griffin, we empirically study the networks of romance scams commonly known as pig butchering. Lastly, in "Are Crypto Anti-Money Laundering Policies Effective", written with John Griffin and Zirui Wang, we empirically demonstrate how users move illicit funds in the face of regulation designed to deter money laundering. We visit five regulations, including one know-your-customer (KYC) regulations for decentralized finance (DeFi) services, which are actively being debated by the U.S. Senate. Through this pair of papers, we outline a roadmap on what types of scam protection and anti-money laundering policies are effective. This has important implications for how anti-money policies should be carefully crafted for our global traditional and crypto financial system.

Thank you for the opportunity to apply to the NBER Digital Economics tutorial. I believe I would benefit immensely from the opportunity and would also be a strong contributor to the discussion. I have the combination of theory, empirics, and strong interest in all things digital (from ads to labor to platforms) to be a great fit.