The University of Oklahoma
Department of Economics

To whom It May Concern,

This letter is to serve as a recommendation for Zexuan Liu. I know Zexuan since I joined at OU in July, 2014. While Zexuan remained in contact in the summer 2014, the majority of our interaction began once we started a join project along with his primary advisor Dr. Qihong Liu in Fall, 2014. I was a committee member on Zexuan's proposal defence and subsequently served his dissertation committee.

Zexuan's primary research area is Industrial Organization with speciality on the US airlines industry. The three chapter of Zexuan's dissertation embody this effort to overcome endogeneity and estimate the casual effects of 'tarmac delay', 'airlines merger', and 'quality uncertainty' on different outcome variables such as horizontal and vertical product differentiation. All these papers use large microeconomic data from the US airlines industry. Identifications are based on conventional estimation methods such as difference-in-difference, propensity score matching and fixed effect model.

I think Zexuan's job market paper is a good fit for top field journals in Industrial Organization. This paper estimates the impact of merger on different types of product differentiation using the merger between US Airways and America West in 2005. This paper used panel matching with a difference in difference approach to address the selection issue of merger. The existing literature used only difference in difference method. This paper paper made significant improvement on identification compared to the existing studies. This paper also shows his ability to implement robust estimation in empirical research.

The first chapter of dissertation estimate the impact of tarmac delay policy on airlines on-time performance. In December 2009, US department of transportation introduced this policy to eliminate long tarmac delay. This topic is important and relevant. Zexuan used DID estimation method and found that although the average tarmac delay decreased but the number of cancelation of flight increased due to the policy. The effect of the policy on social welfare is ambiguous. In third chapter, Zexuan estimates the impact of quality uncertainty on horizontal differentiation. Using fixed effect model this paper shows that higher quality uncertainty causes less horizontal differentiation.

I believe that Zexuan's current research portfolio is promising and showcases a diverse skill set and willingness to learn new methods when needed. Proficient at using propensity score matching and regression discontinuity design, he actively considers the application of these tools to additional questions. His ability to learn estimation techniques as needed demonstrates a promising ability to tackle future research research challenges. I am very optimistic about Zexuan's working papers and believe

that the toolkit he has developed can be leveraged to write publishable papers in future.

I have regular interactions with Zexuan and find him to be outgoing and likeable. On the occasions where I have seen Zexuan's interaction with others, he has been both friendly and helpful. It is worth highlighting that Zexuan has a excellent teaching assistant record through out his graduate school. As an active teacher of undergraduates, I have on several occasions heard praise for his teaching style in the lab sessions from mutual students. More so than any other graduate student I have ever worked with at OU, Zexuan makes an exceptional effort to think critically not only about the content of his lectures, but also how he delivers this material to the students.

All of this is to say that Zexuan is genuinely interested in pedagogy and driven to improve the classroom experience for his students. I believe his stellar teaching will continue to evolve in positive directions in the future. Given his skill set and interests, I would expect Zexuan to excel at teaching classes in principles, intermediate microeconomics, econometrics and statistics.

Apart from the independent research ability and excellence in teaching, Zexuan's proficiency on programming in Stata, SAS, R and LaTex makes him a very effective applied researcher. I believe Zexuan more than capable of research and teaching and have no reservations about highly recommendaing him for both academic and non-academic positions alike. If you have any questions about Zexuan or his research, you may reach me at (315) 664 2962 or pallab.ghosh@ou.edu.

Sincerely,
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