

**Effects of High-Speed Rail Speed on Airline Demand and Price:
Theoretical Analysis and Empirical Evidence from a Quasi-natural Experiment***

by

Prof. Anming ZHANG
Full Professor in Operations and Logistics
Sauder School of Business
University of British Columbia

*Co-authored by Kun Wang^a, Wenyi Xia^a, Anming Zhang^a, Qiong Zhang^b

^aSauder School of Business, University of British Columbia, 2053 Main Mall, Vancouver, BC, Canada V6T 1Z2

^bSchool of Economics and Management, Anhui Normal University, Wuhu 241000, China

Date: 11 October 2017 (Wednesday)

Time: 2:30pm - 3:30pm

Venue: M714, Li Ka Shing Tower

The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

This study investigates, both theoretically and empirically, the effects of high-speed rail (HSR) speed on airline demand, equilibrium airline traffic and price. The analytical model suggests that HSR speed affects HSR service quality on both travel time and passenger's safety perception. A speed reduction can have both a positive effect on airlines due to longer HSR travel time (the "travel-time effect"), and a negative effect due to an improved HSR safety (the "safety effect"). The net HSR speed effect on airline demand and equilibrium traffic and price depends on the relative importance of these two countervailing travel-time and safety effects. The elasticities of airline demand, equilibrium traffic and price with respect to HSR speed increase, in terms of magnitude, with the substitutability between air and HSR services. The inter-airlines competition would moderate the magnitude of the elasticity of equilibrium airline price with respect to HSR speed. We utilize a rare quasi-natural experiment of HSR speed reduction in China to empirically verify our theoretical predictions. The empirical evidence suggests that HSR speed reduction overall has a positive impact on airlines, suggesting the dominance of the travel-time effect (over the safety effect). We further quantify the HSR speed effects on airlines demand, equilibrium traffic and price in markets with different degrees of air-rail service substitutability.

Keywords: High-speed rail speed; Airline demand and price; Natural experiment; Difference-in-differences (DID); Travel-time effect; Safety effect; Air-rail substitutability

Bio:

Anming Zhang is a Full Professor in Operations and Logistics and holds Vancouver International Airport Authority Chair Professor in Air Transportation at Sauder School of Business, University of British Columbia (UBC). He served as the Head of the Operations and Logistics Division, Sauder School of Business (2003-2005), and as the Director of UBC's Centre for Transport Studies (2003-2004). He had been the Vice President (Academic & Program) for the *World Air Transport Research Society* (ATRS) between 2006 and 2017. Dr. Zhang is the recipient of the "Yokohama Special Prize for Outstanding Young Researcher" awarded at the *7th World Conference on Transportation Research (WCTR)* in Sydney, Australia in 1995, and of the "WCTR-Society Prize", awarded to the overall best paper of the *8th WCTR* in Antwerp, Belgium, in 1998. In June 2014, he won the "Best Overall Paper Prize" at the annual *ITEA (International Transport Economics Association) Conference on Transportation Economics*, Toulouse School of Economics, France.

Dr. Zhang has published over 150 refereed journal papers in the areas of transportation, logistics, industrial organization, and Chinese economy. He has co-authored two recent books: *Globalization and Strategic Alliances: The Case of the Airline Industry*, 2000, Pergamon Press, Oxford; and *Air Cargo in Mainland China and Hong Kong*, 2004, Ashgate, London (*Chinese editions* published both in Hong Kong and Mainland China).

Please email to winnie.wy.tang@polyu.edu.hk for enquiries.

All are welcome!