The invisible costs of promoting competition in the airlines industry

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Abstract
Since the Airline Deregulation Act in 1978, the airline industry drastically transitioned from the most regulated to one of the most competitive. From 1990 to 2019, annual passenger enrollment doubled to almost 550 million customers while average inflation-adjusted fare halved to $350. Airline industry’s profit margin is among the lowest at 8.2% in 2018, only slightly more than half of that of U.S. average (15.2%). How would such competition affect airline’s behavior, market structure, and ultimately, the future of aviation? This paper explores the effects of airline industry competition on the firms’ costs and operations behavior. Specifically, the effects of competition on airline’s safety expense, product-differentiation expense, route choices and fleets.

Introduction
This article begins by deriving an estimate for the degree of competition, employing the discrete choice techniques with differentiated product to estimate the demand for air travel in the U.S. domestic markets. A measure for competition in the industry is formulated for each airline during the period. This competition index is then used to evaluate the effect of competition on the multiple costs and characteristics of airlines, using the instrumented difference in differences method. My result shows that, the expense for safety does not change significantly, but the expenses for product differentiation decreases as the markets become more competitive. Airlines fly longer routes on average, and air fleets gravitates towards homogeneously narrow-body, long-distance airplanes as airlines face more competition.

Empirical estimation
In a fiercely competitive market, it is expected that the markup for each airline is minimal, and the market is so elastic that raising price is not an option. This would expectedly push the firm to reduce its marginal cost to maintain a competitive edge with its industry rivals. But which costs to cut is the question. In this section, I explore the effects of competition on safety expenses and product-differentiating expenses. An estimation procedure of DDIV (instrumented difference in differences) is employed to address endogenously (reverse causality) between costs and competition.

Costs of promoting competition

Conclusions
In this paper, I estimated the effects of competition on cost behavior and market structure of the airline industry. The estimation is broken into two steps: step one estimates the demand elasticities for the airlines, while step two takes the elasticity derived from step one to evaluate the effect of more competition on costs behavior of the firm and the market structure. Step one shows that the market is increasingly competitive. Step two shows that this competition doesn’t significantly affect safety expenses, but it does decrease expense for consumer experience, aka product differentiation expense.

References

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Figure 1. Airfare trend 1970-2011
Figure 2. Budget airline fleet homogeneity and usage, example.

Figure 3. Demand price elasticity result: it’s becoming more competitive.
Figure 4. Demand estimation results with consumer heterogeneity

Figure 5. The effects of competition on different costs and operational behavior