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Can market power be controlled by regulation of core prices alone? An empirical analysis of airport demand and car rental price ☆

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ABSTRACT

Many firms offer "core" and "side" goods in the sense that side-good consumption is conditional on core-good consumption. Airports are a common example where the supply of runway and terminal capacity is the core good and the supply of various concession services (for example, car rental services) is the side good. While side-good supply can be responsible for a major share in total revenue, monopoly regulation typically concentrates on the control of core-good prices ("core prices" in short). Whether market power can indeed be effectively controlled by the regulation of core prices alone then depends on whether core-good consumption is a function of the price for side goods. This study empirically shows that a one-dollar increase in the daily car rental price reduces passenger demand at 199 US airports by more than 0.36%. A major implication of our findings is that for the case of airports, the effective control of market power may require regulation of both prices for core and side goods.

1. Introduction

Over the last thirty years, the airport industry has faced two striking trends: First, there is growing importance of "concession revenues," which include revenue from retailing, advertising, car rentals, car parking, and land rentals (e.g., Zhang and Zhang, 1997, 2003; Forsyth, 2004; Thompson, 2007), as compared to the traditional aeronautical revenue associated with runways, aircraft parking and terminals. Nowadays, airports worldwide derive as much revenue, on average, from concession services as from aeronautical ones (e.g., Zhang and Czerny, 2012). Second, private airport ownership becomes more prevalent. Starting with the privatization of seven United Kingdom airports controlled by the British Airports Authority in

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1987 where four were located in Scotland and three in the London area (Heathrow, Gatwick and Stansted), many airports around the world have been, or are in the process of being, privatized (e.g., Oum et al., 2004).[1] Since airports possess a significant amount of monopoly power in many situations, infrastructure charges of privatized airports are often subject to economic regulation. Such regulation has nevertheless focused on aeronautical services only, with airport concession services being generally left unregulated.

The present paper investigates the question of how the price of side goods, such as airport concession goods and services, can affect the demand for core goods and services (traveling activities). As discussed in more detail in the following, a good understanding of this relationship is fundamental for the design of regulatory regimes for airports. While the present study mainly reverts back to the airport industry as an example, the insights are also useful for other transport industries. For example, in the (passenger) rail industry, the supply of rail tracks and stations can be considered as the core good of rail infrastructure providers, while the supply of various concession services at train stations can be considered as the side good. Thus, the same question emerges for rail infrastructure providers as for airports: Can monopoly market power be effectively controlled by regulation of the core prices alone?

It seems directly plausible that concession revenues change the incentives for private, profit-maximizing airport infrastructure pricing, because they are closely linked to passenger quantities. Theory, however, shows that there are two possibilities, which depend on whether the passenger quantity is independent, or a decreasing function, of airport concession prices. Independence may occur because buying the air tickets and car rental services can be separated in time (e.g., Zhang and Zhang, 1997, 2003).[2] On the other hand, experienced travelers, e.g., business passengers, may well decide upon traveling based on the entire trip costs for both the tickets and (for example) car rentals. A reduction in the car rental price may therefore increase traveling activities of business passengers.

The policy implications of these two scenarios for private airport pricing are significant. If traveling activities are independent of concession prices, concession businesses may unambiguously exert downward pressure on the private aeronautical charge (e.g., Zhang and Zhang, 1997). The intuition is that airports reduce the private aeronautical charge in order to increase the passenger quantity and thus the demand for airport concession services and profit derived from the supply of airport concession services. To our knowledge, Starkie (2001) was the first who proposed to completely abolish (*ex ante*) private airport regulation because of this effect.

However, the opposite may be true if an increase in prices for concession services reduces the amount of traveling. In this scenario, a reduction in the prices for concession services can be considered as an increase in airport "quality," which increases travel demand (Czerny and Lindsey, 2014). Czerny (2006) provides a numerical example, where the private aeronautical charge with airport concession services is *higher* than the private aeronautical charge in the absence of such services. He further shows that it can be welfare-optimal, in the sense of Ramsey (1927), to charge car rental services at marginal costs and cover infrastructure costs only using revenue from aeronautical charges when airport subsidy payments are unavailable. Note that a reduction in the car rental charge reduces the price elasticity of airport infrastructure demand (Czerny and Lindsey, 2014), and since Ramsey-optimal prices are inversely related to the price elasticities of demands, this provides an intuition for the welfare-optimality of such pricing structures.[3] As pointed out by Czerny (2006), marginal cost pricing for car rental prices may be difficult to implement through the regulation of infrastructure charges alone; thus, whether airport market power can be effectively controlled by the regulation of infrastructure charges alone depends crucially on whether travel activities are a function of concession prices or not. More recently, Flores-Fillol et al. (2014) developed a unifying approach where consumer foresight is determined by a continuous variable and the associated extreme values capture the scenarios with perfect consumer foresight (analogue to Czerny, 2006) or no consumer foresight at all (analogue to Zhang and Zhang, 1997, 2003), respectively.

Whether travel activities are a function of concession prices or not is an empirical question. Here, some empirical insights can be derived from the literature. Van Dender (2007) analyzes the effects of airline market structure on revenues that airports derive from airlines and passengers. In line with some of the literature mentioned above (e.g., Zhang and Zhang, 2003), he estimates a regression model where passenger quantities are used as an explanatory variable for average concession revenues, but abstracts away from the possibility that concession prices can explain passenger volumes. He finds that an increase in the passenger quantity reduces average concession revenues, which is consistent with the idea that a reduction in prices for concession goods and services can increase traveling activities. Choo (2014) finds that an increase in the share of revenues derived from concession businesses (and hence a decrease in the share of aeronautical revenues) is associated with a reduction in the aeronautical charge. This is consistent with the basic idea that a reduction in aeronautical charges can lead to a reduction in aeronautical revenues. Compared to these two studies, Ivaldi et al. (2014) directly test the effect of airport concession prices on passenger demand. They treat airport car parking prices as exogenous and find a negative effect of an increase in airport car parking prices on passenger demand.

[1] One may argue that these two developments are related to, and may in effect reinforce, each other. As compared to public airports, privatized airports have a greater incentive to explore and expand concession revenues due, at least in part, to the fact that, as discussed in more detail below, usually concession activities are unregulated and hence are more profitable. At the same time, the growing revenues generated from concession activities allow airport privatization politically feasible and attractive. For example, a government could fetch a large (lump-sum) amount of money when selling its airports to private hands, or receive continuous payments from the privatized airports as a landlord, or both.

[2] Bracaglia et al. (2014) usefully point out that the increasing use of online booking and the fact that airport car rental or car-parking services are offered at the time of air ticket purchase may have increased consumer foresight relatively to earlier days.

[3] Czerny (2006) did not consider airport congestion. See Yang and Zhang (2011), Czerny (2013), D'Alfonso et al. (2013) and Czerny and Zhang (2015) for analyses of airport concession services when airports are congested.