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The competitive effects of firm exit Evidence from the U.S. airline industry

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ABSTRACT

We study the competitive effects of five liquidations and six mergers in the domestic U.S. airline industry between 1995 and 2010. Applying fixed effects regression models, we find that route exits due to liquidation lead to substantially larger price increases than merger-related exits. Within the merger category, our analysis reveals significant price increases on all affected routes immediately after the exit events. In the medium and long-run, however, realized merger efficiencies and entry-inducing effects are found to be strong enough to drive prices down to pre-exit levels.

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1. Introduction

The benefits of competition and innovation are largely ensured by both market entry and market exit. Market entry plays a key role as an equilibrium force – which competes away excess profits to an equilibrium level – and as a disequilibrium force—which propels the industry from one equilibrium state to another due to the introduction and diffusion of innovations (see Geroski, 1991, 1995). Market exit is considered a key instrument to sanction unprofitable product and service ideas thereby renewing the industry population through a process of 'creative destruction' (Schumpeter, 1942). Only the close interaction of market entry of innovative and/or more efficient new firms and the corresponding decline and market exit of less innovative and/or less efficient incumbent firms through either merger or liquidation can guarantee dynamically efficient markets.

The U.S. airline industry has experienced many firm entries and exits since its deregulation in 1978. For example, following a transition period in the years after deregulation, with a moderate number of (in sum) 13 firm entries and 6 firm exits, the substantial growth period from 1982 to 1984 witnessed the entry of 31 new interstate airlines – excluding regional carriers – compared to only 15 exits either through merger or liquidation. However, the subsequent shake-out period from 1985 to 1987 showed roughly inverted characteristics with only 16 additional entries compared to 38 exits (mostly through liquidation).[1]

Although the number of mergers and liquidations in the last two decades has been substantially lower than in the first shake-out phase of the liberalized U.S. airline industry, both types of firm exit continue to have a substantial impact on the industry. This is particularly true for large mergers such as American Airlines–Trans World Airlines (2001), America West–US Airways (2005), Delta Air Lines–Northwest Airlines (2009) and United Airlines–Continental Airlines (2010) but also for larger liquidations such as National Airlines (2002), Independence Air (2006) and ATA Airlines (2008).

Despite this continuing relevance of firm exits in the U.S. airline industry, recent empirical evidence is scarce. Empirical studies on the effects of liquidations do not exist to the best of our knowledge and the existing studies on the competitive effects of airline mergers almost exclusively stem from the 1980s and focus on the specific case of a largely overlapping route network of the merging parties (due to a shared hub). However, such a network structure is rather uncommon in recent mergers. It therefore raises

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[1] The data stems from Borenstein and Rose (2012). Interestingly, the authors report that out of the group of 44 (interstate) carriers that entered the U.S. airline industry between 1979 and 1984, only 7 operated in 1990 and only two remain in operation today (Southwest Airlines and America West (using the US Airways brand)).

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the demand for both a new conceptual framework for investigating firm exits in the airline industry and a corresponding new empirical analysis of the effects of such exits.

Against this background, we study the competitive effects of five liquidations and six mergers in the domestic U.S. airline industry between 1995 and 2010. Applying fixed effects regression models, we find that route exits due to liquidation lead to substantially larger and permanent price increases (of about 12%) than merger-related exits. Within the merger category, our analysis reveals that prices on overlapping routes increase by about 6% in the short run, whereas a simple merger-induced switch of the operating carrier causes a significant price increase of about 3%. Accordingly, we observe large reductions in quantity for route exits caused by firm liquidations and moderate reductions in case of merger-related exits. Entry-inducing effects of firm exits are found particularly for liquidations and smaller mergers. Our findings have important implications for unilateral effects analysis as part of horizontal merger assessments.

The paper is structured as follows. The following Section 2 provides a conceptual framework for the analysis of the competitive effects of firm exit in the airline industry, followed by the discussion of existing research and descriptive evidence for the U.S. airline industry in Section 3. Section 4 presents our empirical analysis and provides a discussion of the results and their policy implications. Section 5 concludes the paper with a summary of the key results.

2. The competitive effects of firm exit in the airline industry—a conceptual framework

Market exit can be assessed on two different aggregation levels: exit of entire companies due to either liquidation or merger (so-called *firm exits*) and single market exit decisions of still operating companies for strategic reasons such as lack of profitability[2] or – in case of the airline industry - network reorganization (so-called *operational exits*). Firm exits differ from operational exits by the fact that the former typically cause multiple market exits at one particular point in time. Furthermore, while operational exists can typically be reversed if, e.g., market conditions change, firm exits are ultimate thereby reducing (actual and potential) competition on a permanent basis.

The economic effects of the two distinctive forms of market exit can be analyzed from at least two perspectives: 'general economic effects' and 'competitive effects'. The former category investigates the consequences of market exit on general economic factors such as employment or (regional) economic growth. Any study of these general economic effects must look beyond the level of the respective firm and its product markets and has to include important knock-on effects of market exit on, e.g., the airport, other aviation-related service industries or spillovers to the general economic growth in the respective region. For example, if an airline decides to leave a certain hub airport, either due to liquidation (i.e., firm exit) or to network reorganization (i.e., operational exit), it is very likely that the respective airport and other aviation-related service industries will lose business. Furthermore, the entire region might face a reduction in attractiveness due to the lower quality of airline connections.

Complementary to an analysis of the effects of exit on the general economic level, an assessment of the *competitive effects* of exit is a compulsory part of an entire analysis of the economic consequences of exit. Generally, such an assessment investigates the effects of market exit on competition in these markets. Particularly interesting objects of investigation are the effects on average prices, demand, capacity and quality. For example, if before exit, two airlines were competing fiercely in a certain non-stop market and one of the competitors finally has to exit the market due to liquidation, it becomes likely that the remaining carrier will use this opportunity to increase price. However, in the medium and long run, market entry by other (more efficient) airlines might become attractive, i.e., firm exit might create so-called *entry-inducing effects* (see Werden and Froeb (1998) for a seminal paper[3]) suggesting that prices might increase immediately after exit but exhibit a downward trend in the medium and longer run. As a consequence, a study on the competitive effects of exit should not be constrained to an analysis of the short-term effects on price but has to extend its perspective to both a larger observation window and the inclusion and interpretation of further competition variables such as passengers and departures.

In the remainder of this paper, we concentrate on the competitive effects of firm exit. The firm exit category is subdivided further into multiple market exits due to liquidation and multiple market exits due to merger. In our empirical investigation, we include 'operational exits' as third category in order to allow for a direct comparison between the effects of firm exits and single market exits. For a detailed discussion of the competitive effects of firm exit, we draw on a simple airline network with two separate airlines 1 and 2 operating hubs H_1 and H_2, respectively (see Fig. 1).

The two hubs are connected by services of both carriers (route H_1H_2) while the respective spokes are only served by the respective hub airline, i.e., routes AH_1, BH_1 and CH_1 by airline 1 and H_2D, H_2E and H_2F by airline 2. In the following sub-sections, we discuss the competitive effects of a liquidation, i.e., airline 1 disappears from the market, and the competitive effects of a merger, i.e., airline 2 acquires airline 1 and continues operating the entire network.

2.1. Firm exit through liquidation

The bankruptcy laws in many countries allow two different forms of bankruptcy: the attempt of reorganization (and a potential 'emergence' from bankruptcy) or a process of liquidation (which typically leads to the exit of the respective firm). As the focus in this paper is on the effects of firm exit, we concentrate on those bankruptcies which lead to the ultimate market exit (i.e., liquidation) of the respective firm.

When studying the competitive effects of liquidation exits on prices and quantity, basic oligopoly theory allows the derivation of several key relationships. In the short run, at least two separate arguments speak for significant price increases. First, the substantial reduction in capacity due to exit of one competitor is expected to cause substantial price increases and corresponding reductions in quantities. Second, pre-exit competition on the respective routes might have been fierce (as at least one carrier was fighting for life) suggesting price increases 'up to the usual competitive level' post-exit.[4] Referring to the simple airline network defined above, the described competitive effects are expected on all routes

[2] Several reasons for an unprofitable route presence are conceivable: incumbent(s) reaction(s) to entry, wrongly estimated demand (O&D and/or connecting traffic), insufficient growth potential, increases in passenger facility or airport charges, macroeconomic demand shocks, input cost increases etc.

[3] Werden and Froeb (1998) investigate the role of entry-inducing effects in antitrust policy. Based on mergers in simple Cournot and Bertrand industries, they find that firms only have an incentive to merge if (a) they expect significant efficiencies generated from the merger, or (b) they are aware of substantial entry barriers which allow them to charge supracompetitive profits post-merger. They conclude that antitrust authorities should be rather skeptical with respect to the power of entry to prevent (or reverse) anticompetitive effects of horizontal mergers.

[4] From this perspective, liquidation has the potential to realize 'liquidation efficiencies' in the sense that the market exit of one carrier allows the remaining carriers to earn a reasonable return on investment and to continue serving the respective market.

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