Mergers and Business Model Assimilation: Evidence from Low-Cost Airline Takeovers

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Abstract

This paper examines mergers that lead to an almost immediate replacement of the target firm's business model in favour of that of the acquiring firm. We examine the post-merger behaviour of the two leading European dedicated low-cost airlines, EasyJet and Ryanair, each acquiring another low-cost airline, respectively Go Fly and Buzz. We find that both takeovers had an immediate and sustained impact on both the pricing structures and the extent of inter-temporal price discrimination used on the acquired routes, with early booking fares noticeably reduced and only very late booking fares increased. Overall, the analysis points to a pro-competitive effect of both takeovers as a consequence of the introduction of the acquiring firms' business models and associated yield management pricing systems.

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> Back in the 19th century, a place on Europe's rail network could make a city's fortune. Now it's a listing in the schedules of a new generation of low-cost airlines. During the past decade scores of new routes have cobwebbed across the continent, putting cheap flights within reach of every vacationer or jobseeker. Remote corners of Europe, terra incognita to anyone but locals, have become destinations, drawing visitors from the outside world and, increasingly, bringing new prosperity. Head-spinning fares are uniting East and West as the founding fathers of the European Union would never have imagined. "We are the means by which hundreds of thousands can now travel back and forth: they are almost commuting," says Michael O'Leary, head of Ryanair, Europe's largest budget carrier. "Low-cost airlines are the new Europe."
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> "Budget Bonanza", *Newsweek International*, 16 March 2006

1. Introduction

Low cost airlines ("LCAs") have revolutionised passenger air travel in Europe, North America, Asia and beyond, bringing "no frills" operations to a broader public generally at substantially lower prices than traditional full-service airlines ("FSAs"). In Europe, their rapid growth has been made possible by the civil aviation industry being fully liberalised in 1997, allowing any airline registered in any EU member state to serve any city-pair inside the EU.[1] In the process, the industry has been radically shaken up as LCAs expanded their operations, opening up new routes with new destinations and greatly extending demand with their low prices, forcing the traditional airlines to respond by adapting their own operations and prices to compete more effectively.[2] As a consequence, passengers appear to have been the real winners from this revolution; enjoying a wider choice of routes, more frequent flights, and lower prices.[3]

Nevertheless, as the sector matures and consolidates, there is a concern that price competition might diminish. In particular, it is recognised that mergers between airlines may allow efficiencies to be realised, but will this be at the expense of higher prices and less choice for consumers? The recent decision by the European Commission to block the proposed merger of Ryanair and Aer Lingus highlights how seriously this concern is now taken.[4] The central question examined by this paper is whether previous mergers involving LCAs have had such an effect. Specifically, this paper assesses the impact on prices of the first two important mergers involving European LCAs: EasyJet's acquisition of Go Fly in 2002 and Ryanair's acquisition of Buzz in 2003.

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[1] A city-pair is used as synonymous with the airline market for two cities (e.g., London and Rome). It generally includes more than one route, each identified by a unique airport-pair combination (e.g., London Heathrow/Rome Fiumicino and London Stansted/Rome Ciampino). In such markets, products are thus differentiated.

[2] As Gagnepain and Marin (2006) show, greater competition in the wake of deregulation may also have brought about productivity improvements and other efficiency benefits.

[3] In addition, as new destinations have developed, wealth and jobs have been generated in the local vicinities, often transforming local economies. For illustrations on the impact around Europe, see Underhill (2006).

[4] See "Commission prohibits Ryanair's proposed takeover of Aer Lingus", European Commission press release IP/07/893, 27 June 2007.

Although other mergers among LCAs have occurred in the past (e.g. Southwest's acquisition of both Morris Air and Muse Air), previous studies of airline takeovers have largely focused on FSAs in the US (e.g. Borenstein 1990; Werden et al. 1991; Kim and Singal 1993; Morrison 1996; Richard 2003; Peters 2006). More generally, there has been a large number of studies examining the airline industry because of its distinctive features and availability of detailed data, but again largely from the perspective of FSAs. For instance, previous studies have considered effects relating to multi-market competition in respect of localised market power (Evans and Kessides 1993; 1994) and hub-and-spoke networks (Borenstein 1989; Bruekner et al. 1992), as well as outcomes in respect of price dispersion (Borenstein and Rose 1994), price discrimination (Stavins 2001), dynamic pricing (McAfee and Velde 2006) and general pricing trends (Borenstein and Rose 2007). Existing studies on LCAs have mostly focused on their entry patterns and effects on FSA incumbents (Whinston and Collins 1992; Richards 1996; Windle and Dresner 1999; Goolsbee and Syverson 2006).

The present paper seeks to extend this literature by examining the impact of the aforementioned two airline mergers on quoted on-line fares, the key means by which tickets are purchased for LCAs.[5] Drawing on a novel and very extensive dataset of posted prices taken at frequent intervals over a prolonged period before each flight departs, we are able to build up a very detailed picture of the pattern of prices facing consumers for each route and each flight operated by each airline serving routes from the UK to other parts of Europe. This data covers all main LCAs as well as competing FSAs providing return flights over a 37-month period (from the start of June 2002 through to the end of June 2005).

The comprehensive nature of this data allows us to evaluate the price behaviour of the firms engaged in the two mergers and their rivals for up to two complete years after each takeover, thereby providing a detailed insight into the subsequent pattern of fares and, therefore, also into the *overall* net impact on consumers. A further novel feature of our analysis is that we consider how the business model and associated approach to yield management of the acquiring firms may have impacted different consumer types and thereby evaluate the *distributive* impact of the mergers on consumers. Specifically, we examine how the mergers affected airlines' price discrimination strategies regarding the timing of bookings in order to compare the effects on "early bookers" as opposed to "late bookers". Along with consideration of other aspects affecting consumer welfare in the form of the number of routes served and flight frequency, we can thereby assess whether the mergers are likely to have had a beneficial or detrimental effect on some, most or all consumers.

We provide some illustrative cases to show the effects at a very micro level before moving on to present more general empirical evidence using "propensity score matching" and "differences-in-differences" estimation techniques to compare the fares in the acquired routes in the pre- and post-

[5] For instance, EasyJet reported that by 2003 around 97% of purchases were made on-line, moving to 98% by 2005 – see http://www.easyjet.com/common/img/UBSTransportConference19thSept05.pdf.

merger periods.[6] Four findings stand out from our analysis. First, straight after concluding the takeovers, the acquiring firms reduced most types of posted fares, especially early booking fares. The only notable exception was a sharp increase in Ryanair's posted fares for the day immediately before departure on the routes taken over. Second, in the 24 months after the takeovers, the fares of the acquiring firms remained largely stable, with only minor upward adjustments of EasyJet's late booking fares. Third, and related to the two previous findings, the acquiring firms altered pricing in a consistent manner for the acquired routes, indicating that they each introduced their own specific approach to *yield management* (i.e. the means of selling seats amongst differentiated customers with a view to maximising profit for each flight) involving a more intense inter-temporal price discrimination strategy with early bookers paying lower prices than previously but very late bookers paying more (Gale and Holmes, 1993) – pointing to a different impact arising from the merger for different consumer types. Fourth, given that only a small proportion of seats are sold by LCAs in the last week before departure,[7] the general price reductions suggest that, despite higher prices for some consumers, both takeovers appear to have significantly benefited consumers in aggregate. This view that consumers overall have benefited from both mergers is reinforced by the fact that after the takeovers very few routes were terminated and Ryanair increased the number of flights it operated on its acquired routes while EasyJet maintained them at approximately the same level as prior to the merger.

Our findings thus point to an interesting aspect regarding the nature of efficiency benefits arising from a merger. Most previous studies of mergers point to efficiency benefits in terms of organisational and production restructuring, often taking considerable time to be realised – e.g. see the surveys by Paulter (2003) and Röller et al. (2006) or Focarelli and Panetta (2003) for an insightful sector study. However, in our case we find efficiency and pro-consumer benefits are quickly realised due to the acquiring firm immediately imposing its own business model and yield management system on the acquired routes' operations in order to maximise the productivity of its assets (i.e., airplanes' capacity utilisation) and revenues. This is borne out in our analysis not just with the use of more intense inter-temporal price discrimination entailing significantly lower prices for all but very late bookers but also through its effects in serving to improve load factors and increasing the numbers of passengers carried on each flight.

In other words, a merger may allow for a different and perhaps superior business model to be quickly implemented which may then immediately start providing consumer benefits. Indeed, a similar immediate post-merger impact has been observed in other market contexts, e.g. in grocery

[6] See Cameron and Trivedi (2005) for a discussion of these methodologies and Nguyen et al. (2006) and Girma and Görg (2007) for respective applications in different contexts.

[7] For instance, Barlow (2000) suggests that less than 20% of tickets are sold in the final week before departure. Similarly, working with data provided by EasyJet, the examples provided by Koenigsberg et al. (2003) show less than 15% of tickets sold before the final week. Moreover, with average load factors for LCAs reported by the European Low Fares Airline Association being 83% for 2006, it can be expected that many flights are fully booked in advance of the last week before departure – see http://www.elfaa.com.

markets where a value-oriented retailer acquires a premium-pricing retailer (Chakraborty et al. 2007). In terms of merger analysis, this suggests that competition authorities should pay close attention to the character and competitive positioning of the acquiring firm and to whether it is likely to operate the acquired business in respect of its commitment to its particular business model, which may offer consumer benefits even if the merger significantly increases market concentration.

The structure of the paper is as follows. The next section reviews the background to the two mergers and how they proceeded. Section 3 discusses the possible concerns about anti-competitive effects arising from these mergers. Section 4 explains the data collection method and the characteristics of the dataset used. Section 5 draws on this dataset to provide a descriptive analysis of the takeovers and offer insights on the companies' specific pricing policies, the extent of price dispersion, and the characteristics of routes and markets served. Section 6 sets out the methodology used to assess the impact of the takeovers on passenger fares. Section 7 reports and discusses the results of our empirical analysis. Section 8 provides some concluding remarks.

2. Two Contrasting LCA Mergers

Ryanair and EasyJet, as two of the pioneers of low-cost airline travel in Europe, have also become two of Europe's largest airlines. Founded in 1985 and based in Dublin, Ryanair expanded its route network rapidly following liberalisation of intra-EU air services, increasing its passenger numbers from 2.25 million in 1995 to over 40 million by 2006. EasyJet, established in 1995 and based at London Luton airport, has similarly expanded rapidly; taking its passenger numbers from 3.1 million in 1999 to 33 million in 2006. Both airlines have not only been remarkably successful in growing passenger numbers and revenues, they have also been consistently profitable businesses in a sector in which many airlines have struggled to make profits from one year to another.

Drawing on the business model established by Southwest Airlines in the US, the low-cost carrier business model that Ryanair and EasyJet share is centred on stripping out and avoiding all the complexity costs associated with traditional full service carriers. This business model has several notable features: (i) using a simple pricing structure with one passenger class and fares only covering basic transportation (with optional paid-for in-flight food and drink); (ii) relying on direct selling through Internet bookings with electronic tickets and no seat reservations; (iii) operating simplified routes to often cheaper, less congested airports (with point-to-point rather than hub-and-spoke networks); (iv) employing intensive aircraft usage (typically with 25-minute turnaround times); (v) having employees working in multiple roles (e.g. flight attendants cleaning the aircrafts and acting as gate agents); and (vi) utilising highly standardised fleets (with a maximum of two different aircraft types).

Furthermore, in contrast to the usually very complex pricing structures operated by FSAs (with price discrimination on each flight across multiple service classes and booking classes, utilising

"fences" like minimum stay requirements and date/route change penalties), for Ryanair, EasyJet and other LCAs segmentation of prices is essentially made on the basis of just two variables: first, the date of booking, with the lowest fares generally available several weeks/months ahead of the scheduled departure date and then rising as the departure date draws closer (i.e. inter-temporal price discrimination, rewarding early reservations and with fares increasing as the plane fills up); second, the effective demand for a specific flight such that typically early morning, late night, and mid-week and off-season departures are lower priced than for flights during peak-travel periods (Piga and Bachis, 2007).

Faced with the need to compete with LCAs (principally on short-haul flights) and hoping to curtail their growth, many FSAs opted to launch their own no-frills airlines. On this basis, British Airways launched Go Fly in 1998 and KLM launched Buzz in 2000, around which time a raft of other FSAs also launched their own LCAs (including BMI's Bmibaby and Lufthansa's 49% stake in Germanwings). Yet, unlike the dedicated and highly effective LCA business model used by specialist LCAs like Ryanair and EasyJet, and despite access to the parents' expertise and strong financial backing, the spin-off nature of the FSA-led LCAs tended to compromise (or at least restrict) their operations. First, in order not to cannibalise the parent's core business, the spin-off operations generally did not operate in direct competition with their parent's FSA business; so that rather than serving primary routes they were typically obliged to serve secondary routes. Second, as a legacy of their parent's FSA model, costs could not always be pared down to the ultra-low level of the leading dedicated LCAs, resulting in them often adopting a differentiated, hybrid-type position offering "some frills" (e.g. allocated seating and more leg room), and serving to attract a higher proportion of business travellers.

Nevertheless, within two years of its launch, Go Fly achieved a modest profit. Yet, in June 2001, British Airways opted to sell the business for £110m as a private-equity backed management buyout. As a stand-alone business, Go Fly grew quickly and profitably the following year, becoming the third largest LCA in Europe (after Ryanair and EasyJet). In May 2002, EasyJet announced its intention to buy Go Fly. Having previously achieved all its growth organically, EasyJet saw the opportunity to nearly double its size (at least in routes covered) by acquiring an airline with largely complementary operations, using different UK bases, and overtake Ryanair as the largest European LCA. Following merger clearance from the UK authorities in July 2002,[8] EasyJet completed the acquisition for £374m in August 2002. Go Fly continued to operate flights independently until mid-December 2002, after which EasyJet started to operate on all of Go Fly's former routes – see Table 1

[8] In advising the Secretary of State for Trade and Industry, the Office of Fair Trading noted that while the merger would create a substantial market share for the merged entity on some overlapping routes (e.g. Edinburgh/Belfast at 90 per cent with 31 per cent incremental rise), it took the view that all overlapping routes would remain contestable, with competitive choice across destinations and among carriers along with low barriers to entry sufficient to ensure that the merger would not substantially lessen competition. See http://www.oft.gov.uk/advice_and_resources/resource_base/Mergers_home/mergers_fta/mergers_fta_advice/easyjet.

and Table 2 for a list. By April 2003, the combined businesses operated fully under the EasyJet brand.

– *Tables 1 & 2 near here* –

In contrast to the relative pre-merger success of Go Fly, Buzz was incurring significant losses (estimated at €1m per week) by early 2003 and its parent, KLM, was seeking to sell the "financially distressed" operation; even though by then it had become the third largest LCA in Europe, but still considerably smaller than Ryanair and the merged EasyJet/Go Fly enterprise. In February 2003, Ryanair announced its intention to acquire Buzz and fundamentally restructure the business – making 440 job redundancies (out of a total staff of 610), retaining only 13 of the 24 routes operated (including 3 substituted routes), and cancelling all operations for the month of April 2003 while retraining Buzz personnel and agents in Ryanair policies and procedures. With regulatory approval granted in April 2003, Ryanair purchased Buzz for £15.1m (i.e. a mere fraction of the price EasyJet had paid to acquire Go Fly while allowing Ryanair the benefit of increasing its share of slots at Stansted airport from 33 to 49.5 per cent). Details of the routes operated by Buzz, in respect of which ones were continued, substituted or terminated after the takeover, are shown in Table 1. For the sake of ensuring like-for-like pre- and post-merger price comparisons, we only use the routes that were continued in the evaluation of the takeover.[9]

3. Possible Anti-Competitive Effects

In examining how the takeovers affected the pricing structures of the acquired firms and the routes operated, we seek to shed light on whether the takeovers facilitated the acquiring firms' ability to unilaterally exercise market power and raise fares.[10] From a theoretical perspective, a merger amongst directly competing oligopolistic firms is likely to result in raised prices unless there are significant efficiency benefits associated with the merger. This result is robust and holds in standard quantity-setting homogeneous products Cournot oligopoly models (Farrell and Shapiro, 1990, 2001); and in a price-setting oligopolistic competitive framework among differentiated rivals facing interdependent demand (Denekere and Davidson, 1985; Motta, 2004).[11]

[9] In the case of the substituted routes, these were often to nearby airports (in the same broad region). The three terminated routes were viewed as too unprofitable to be retained, being already well served by other airlines. Ryanair continued to use the Buzz brand until October 2004, after which all flights were branded as Ryanair.

[10] That is, we do not address the issue of coordinated or collusive effects.

[11] For example, Denekere and Davidson (1985) show that as the number of firms (brands) decline and absent offsetting efficiency benefits, a firm's perceived demand curve becomes less elastic and the optimal price and price-cost margin increases. Similarly, Motta (2004, pp. 233-250) develops a model where firms have different products and a merger creates a new firm endowed with a larger portfolio of substitutable products. He shows that, absent efficiency gains, a merger leads to higher post-merger price, higher profits for all the firms and to lower consumer surplus and total welfare.

An important exception to the latter theoretical result is where not all firms in an oligopoly are direct competitors with each other. For instance in Levy and Reitzes (1992), geographical differentiation is represented in the form of products located along a circle line and thus, two adjacent products are closer substitutes than more distant ones. In this case, only a merger that involves neighbouring products raises prices.

Accordingly, the manner in which airlines differentiate from each other and whether they compete directly ("head to head") may take on some importance in respect of the price effects resulting from any merger. In practice, airlines differentiate their products along a number of dimensions, the most notable of which is the choice of a route's endpoints, i.e., the geographical differentiation of an airline's network.[12]

Based on the above theoretical considerations, the evaluation of the merger between two airlines can hinge on the proximity of their products as well as the extent by which cost-saving synergies can be realised (given that the presence of sunk costs means that entry barriers likely exist at least to some degree). On the former aspect, two airlines can be perceived as highly differentiated if their networks do not overlap, i.e., they operate in independent city-pairs markets. In principle, this would mean that their merger leaves the competitive situation unaltered. Yet, even if they fly similar (but not identical) routes (say, to Rome Ciampino from either London Stansted or London Luton) then the theoretical models above suggest that their merger can raise anti-competitive concerns when consumers view these routes as largely substitutable. This, in turn, may depend on consumers' willingness to substitute different departure and arrival airports in a given city or even in a region – an aspect that may be influenced by the type of consumer, e.g. leisure or business traveller.

With regard to the Go Fly/EasyJet and the Buzz/Ryanair takeovers, Table 2 provides a list of routes operated by the target and the acquiring companies at the time of the takeovers.[13] It shows that either full or partial overlap characterised about one third of the routes operated by the target companies. Although in this situation it would seem probable that the mergers could facilitate the exercise of market power by the acquiring firms, the decision to allow both mergers could still be justified on at least two grounds. First, the overlapping routes could be positioned in competitive city-pair markets where many other options are available to passengers willing to travel, say, from London to Rome; an aspect we develop and discuss in section 5.3. Second, the takeovers may bring about cost-saving synergies that are revealed by a drop in fares in the post-merger period: an issue that is central to this paper in regard to business model assimilation and the overall impact on prices.

[12] Another strategically important characteristic is the time of the day at which a flight departs, which can influence whether airlines pursue a strategy of minimum or maximum differentiation (Borenstein and Netz, 1999). It may also affect an airline's ability to engage in second-degree price discrimination (Gale and Holmes, 1992, 1993). Furthermore, the frequency of flights on a route may directly influence the departure time of flights, which in turn affects travellers' welfare (Richards, 2003).

[13] Ryanair continued only one of Buzz's overlap routes in Table 1; all the others were substituted with Ryanair's routes as shown in Table 2. This accounts for why no specific analysis is carried out on the price effects of the overlap routes in this merger.

4. Data Collection

Our analysis is based on primary data on fares and secondary data on routes traffic. Starting in May 2002, an "electronic spider", which connected directly to the websites of the main LCAs in the UK (namely, Ryanair, EasyJet, Go Fly, Buzz, Bmibaby and MyTravelLite), collected all the fares in this study. The collection of fares for flights operated by FSAs (covering British Airways, BMI British Midland, Air France, Lufthansa, KLM, Alitalia, Iberia, and Czech Airlines) started in March 2003. This data covers fares only for the flights that the FSAs operated on routes similar or identical to those where a LCA also flew.[14] Thus, FSA fares for routes in the markets affected by the takeovers are part of the comparison group.

It is important to stress that our reference to fares, and as a key difference with previous airline price studies, is to on-line posted prices (for given dates prior to flight departure) and not samples of actual transaction prices (as fares paid by passengers on a given flight).[15] Even so, we control for changes in the size of the carriers' operation on a route by using monthly data on an airlines' number of flights and passengers (see below).

Following Piga and Bachis (2007), to account for the heterogeneity of fares offered by the airlines at different times prior to departure, the spider collected the fares for departures due, respectively, 1, 4, 7, 10, 14, 21, 28, 35, 42, 49, 56, 63 and 70 days from the date of the query. Henceforth, these will be referred to as "booking days". Thus, for every daily flight we managed to obtain up to 13 prices, one for each of these booking days.[16] The main reason to do so was to address the shortcoming common in other studies that departure times and how far in advance the ticket is purchased are not included in the available data on prices (see Peters 2006, p.629).[17] However, given the website characteristics of Opodo, only fares for up to 8 booking days per daily flight were available.

The daily fares dataset spans a 37-month period running from June 2002 to June 2005. The countries whose routes were directly affected by the takeovers were France, Italy, Germany, Netherlands, Portugal, Spain, the Czech Republic and the UK.

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[14] The fares of the traditional companies were collected from the website www.opodo.co.uk, which is owned and managed by British Airways, Air France, Alitalia, Iberia, KLM, Lufthansa, Aer Lingus, Austrian Airlines, Finnair and the global distribution system Amadeus. Thus, fares listed on Opodo represent the official prices of each airline; although Opodo may not report promotional offers that an airline may post on its own website.

[15] Notably, this is a key difference with the US studies using the Databank of the US Department of Transportation's Origin and Destination Survey, which is a 10 per cent yearly random sample of all tickets that originate in the United States on US carriers (Borenstein, 1989, 1990; Borenstein and Rose, 1994, 2007; Evans and Kessides, 1993, 1994; Kim and Singal, 1993; inter alia). Such data is not available in Europe.

[16] For instance, if we consider London Stansted-Bergerac as the route of interest, and assume the query for the flights operated by a given airline was carried out on 1 March 2004, the spider would retrieve the prices for both the London Stansted-Bergerac and the Bergerac-London Stansted routes for departures on 2/3/04, 5/3/04, 8/3/04, 11/3/04 and so on. The return would be on 8/3/04, 11/3/04, etc.

[17] We also control for departure times; see below.

For consistency, collection of the airfares took place at the same time every day. The queries for the LCA were bi-directional, with each leg priced independently. The return flight was scheduled one week after the departure. When a LCA operated more than one pair of flights per day, the fares for every flight pairs were collected. In addition to airfares, we collected the name of the company, the time and date of the query, the departure date, the scheduled departure and arrival time, the origin and destination airports and the flight identification code.

Posted fares for FSAs were for a round trip and were halved to determine the single leg price. They belonged to the cheapest available fare class and were chosen to facilitate comparison with the fares by LCAs; specifically, like those of the LCA, the quoted prices were for non-changeable and non-refundable tickets.[18]

Because of the manner in which on-line prices were posted, we collected fares before tax and handling fees for the case of LCAs, but inclusive of them for the FSAs. Even so, this is not too much of a shortcoming in our context since, as discussed below, the analysis focuses on the changes made by each airline on the fares posted in the same months of two consecutive years. Thus, differencing would generally cancel out the taxes and fees included in the FSAs' fares as long as these have not deviated too much year on year. However, we are aware that this would not capture any upward changes in fixed charges that the LCAs may have introduced during the period.[19] Having examined the different taxes and fixed charges levied over the period study, we estimate that any bias between LCA and FSA fares would likely be less than £4.[20] Also, the amount would be negligible in the price comparisons of the acquiring and target airlines (given that any fixed charges, while possibly different across the two types of firms, would be part of the final price paid by their customers). Finally, note that we do not have data for FSAs for the very late (1 and 4) and very early booking days (before 49 days from departure), so any bias should be relevant only for the intermediate booking days.[21]

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[18] Towards the end of our sample period, Ryanair and EasyJet introduced the possibility to change a ticket, subject to a fixed penalty and the payment of any fare difference. This new strategy, though, does not impinge on the analysis of the takeovers' effects.

[19] Specifically, fixed charges introduce a wedge between the price posted by the LCAs (which we collected) and the actual price paid by the consumers. Failing to take account of increased LCA charges would under estimate, relative to the FSA's fares, the possible increases the LCAs may have introduced, or equivalently over estimate any reduction in their fares.

[20] The evolution of the LCAs' levels of fixed charges could not be tracked by the spider, but it is instructive to look at what type of taxes and charges were imposed upon the travellers, as these did not change over the sample period. The Government tax and the Airport tax are exogenously determined by such institutions and can only contribute to the LCAs' revenues in the case of no-shows. There is a charge if a traveller applies for a refund of such taxes. Also, Opodo tickets were non-refundable. Accordingly, any bias is likely to be a direct function of the level set by the airlines for the following two charges: the Aviation Insurance Levy, a post 9/11 surcharge to cover for the extra insurance costs due to acts of terrorism; and the Wheelchair Levy, which amounts to £0.33 and is only imposed by Ryanair. Noting that the former has been generally applied by airlines worldwide (e.g., the level set by Ryanair in September 2007 was £3.47), the bias when we compare LCAs and FSAs should not exceed the £3.80 for Ryanair, and a similar level for EasyJet.

[21] Other charges were introduced after our sample period. E.g., Ryanair was the first to introduce the charges for checked-in luggage on March 13th 2006. Finally, the credit card charges have always been of similar magnitude across all the LCAs as well as Opodo, and thus do not have any differential role.

To complement the price data with market structure characteristics, secondary data on the traffic for all the routes and all the airlines flying to the countries indicated above was obtained from the UK Civil Aviation Authority (henceforth, "CAA") (see www.caa.co.uk). For each combination of company, route, flight code and departure period (i.e., month/year), the CAA provided traffic statistics such as the number of monthly seats, the number of monthly passengers and the monthly load factors. The total number of flights a company operated in a given month on a specific route could then be calculated by aggregating over the flight codes.

5. Descriptive Analysis of the Mergers

5.1 Impact of takeovers on average fares across booking days

To provide an overview of the impact on fares resulting from each takeover, Table 3 reports the mean monthly fares for all the routes directly affected by the takeovers and in the routes used as a comparison group in our study. The latter includes all the routes that fall into the same city-pairs of the acquired routes (see Table 1), i.e. covering the fares of both other LCAs and the FSAs operating these routes. The table shows the fares broken down by booking days before flight departure and across various time periods. The separation of the time periods is used to distinguish between short-run and longer-term effects of the takeovers. More precisely, the fares for the pre-takeover period (June 2002 to March 2003 for Buzz, and June 2002 to December 2002 for Go Fly) are contrasted with the values one year later for each acquiring company to represent the short-run consolidation period. The longer-term impact is highlighted by the evolution of fares posted by the acquiring firm in the post-merger first and second year of operation in the acquired routes (respectively, May 2003 to April 2004 and May 2004 to May 2005 for Ryanair, and January 2003 to December 2003 and January 2004 to December 2004 for EasyJet). A visual characterisation of the content of Table 3 is provided in Figure1, which contrasts the evolution of fares in the acquired routes (left hand side) with that in the comparison group (right hand side).[22]

– Table 3 and Figure 1 near here –

Taking first the Buzz/Ryanair takeover, for each booking day, Buzz's pre-merger fares are higher than those in the comparison group. In the period immediately after the takeover, Ryanair's fares on the acquired routes fell substantially for every booking day with the exception of 1 day before departure. As can be seen from the top left part of Figure 1, with the exception of the very late booking fares, Ryanair's fares on average stayed below the levels posted by Buzz in both the pre- and post-merger periods. Furthermore, the top right part of Figure 1 reveals that fares in the comparison

[22] The sudden jump shown in the comparison groups at 49 days arises because the fares for the FSAs are available only for the 49 down to 7 booking days. Thus, the comparators for the very late (1 and 4 days) and the very early (70 to 56) booking days relate only to LCA fares.

group show an increasing trend for every booking day and period. Thus, relative to both Buzz and the comparison group, Ryanair appears to have cut all fares with the exception of the fare for the day immediately before departure. Furthermore, comparing Ryanair's prices in the first post-takeover year with those in the second year, the data reveals a generally stable level of fares on the acquired routes across booking days for Ryanair, and further increases in the comparison routes.

– Figure 2 near here –

This characterisation for the Buzz/Ryanair case also appears consistent with the evidence in Figure 2, which uses all the fares available for each airline. Compared with Buzz, Ryanair operates with a much steeper price profile for the days immediately preceding a flight's departure. Taking the evidence presented in Table 3 along with Figures 1 and 2, we can surmise that Ryanair introduced its own specific yield management system to fare setting in the routes it took over, which was substantially different from the one Buzz adopted, and that this system was consistently followed in the two years after the takeover. These issues are further investigated below.

Similar findings appear to apply to the Go Fly/EasyJet takeover. Regarding EasyJet, all its fares reported in Table 3 and shown in the bottom left part of Figure 1 turn out to be lower on average than the ones posted by Go Fly a year earlier and also lower than the comparison group for most booking days. Yet, in the second post-merger year, EasyJet increased its late booking fares (i.e. for the 1, 4, 7 and 10 booking days) on these acquired routes, which in some case were higher than in the comparison group. Similar to Ryanair, EasyJet maintained its lower early booking fares, but for the latest booking days they remained higher than those in the comparison group. Overall, the evidence in Table 3 along with that represented in Figure 1 for the Go Fly/EasyJet takeover suggests that relative to Go Fly, EasyJet offered lower prices on the acquired routes but that it partly reversed its first year's actions, by increasing its late booking fares during the second year.

5.2 Inter-temporal price discrimination policies

The above discussion has highlighted that the acquiring firms lowered the posted prices for most booking days but at some point increased their late booking fares on the acquired routes. To provide some further insight on this latter aspect, it may be informative to take a detailed look at fares on a sample route affected by each takeover.

As an illustration, Figure 3 compares two late and two early booking days on the Stansted-Bergerac route operated by Buzz (until March 2003) and then by Ryanair (from May 2003), showing the mean weekly fares for the 1, 4, 49 and 56 booking days, normalised by the fares posted 10 days prior to departure. The pre-takeover period clearly shows a smaller dispersion of fares across all four of these booking days. Indeed, in the pre-takeover period all the ratios alternate around the value of 1 (i.e., fares for different booking days are not very different from the fares available 10 days before

departure), but in the post-takeover period the late booking fares for 1 and 4 days prior to departure are generally two to three times larger than the base price. However, the early booking fares continue to fluctuate around the pre-takeover values. This suggests that Ryanair, unlike Buzz, is committed to a pricing policy characterized by large price hikes a few days prior to departure. It is also noteworthy that the lowest dispersion in Figure 3 is observed August each year, when all the fares for all the booking days tend to have more similar high levels (presumably because the yield management model takes account of the high anticipated demand in that particular month).

– Figure 3 near here –

As a comparison, Figure 4 shows the same normalised fares as in Figure 3 but on the Stansted-Bilbao route operated by Go Fly until December 2002 and then afterwards by EasyJet. A clear separation of the late booking fares from the early booking ones becomes noticeable only in mid-2003 onwards. As with the previous case, Figure 4 reveals that the late booking fares are generally twice as large as the base fares of 10 days, while early booking fares in the second year of EasyJet's operation can be half the value of the base fare.

– Figure 4 near here –

Both Figure 3 and 4 thus confirm a clear tendency for both acquiring firms to raise late booking fares. This is consistent with an attempt to pursue a more intense inter-temporal price discrimination strategy aimed at extracting more surplus from the consumers that have a low price elasticity, presumably those that indeed book a flight late, while offering lower fares to early bookers that are more price sensitive and have more elastic demand.

5.3 Other effects

Apart from prices, consumer welfare will be affected by other variables, notably the frequency, capacity and choice of flights as well as choice through competing airlines, all of which can be indicative of effective competition prevailing post-merger. Table 4 provides some summary statistics on these aspects pertaining to the routes and the markets directly affected by the takeovers.

– Table 4 near here –

For each takeover, Table 4 reports statistics for the pre-takeover period over which we have fare data (June 2002 to March 2003 for Buzz and June 2002 to December 2002 for Go Fly) and compares them with the values a year later. These figures provide a direct measure of the changes brought about by the acquiring companies and enable a first assessment of the non-price effects of the

two takeovers. On its acquired routes, Ryanair increased the mean number of flights in a route by about 22%, from 63 to 77. This is reflected in the increase from 5282 to 9504 in the mean monthly number of passengers. This implies an increase in the average load factor per flight from 84 to 123. In contrast, EasyJet slightly reduced the flight frequency that Go Fly had scheduled on its routes, and managed to maintain very similar load factors, in the immediate post-takeover period.

Comparing the same variables over the two-year period following the takeovers shows a steady increase in flight frequency, passenger numbers and load factors for the case of Ryanair and a generally stable situation for EasyJet. These differing trends are highlighted in Figure 5, which shows the mean number of passengers across all the acquired routes. The high degree of seasonality in traffic shown in Figures 3 to 5 lends support to the approach followed in this paper to compare values for the same months in different years. Indeed, seasonality is likely to induce monthly temporal effects in the pricing that the companies practice.

– Figure 5 near here –

The remaining variables in Table 4 indicate that the competitive scenarios in the two takeovers were quite similar, but with Buzz/Ryanair operating in slightly more concentrated routes and smaller city-pairs. However, the relevant measures of market structures pertaining to the acquired routes tended to remain largely stable, in particular in the two years following the acquisitions.

Table 5 contrasts the previously discussed characteristics of the acquired routes with the values relating to the routes used as a comparison group. A notable aspect is that the values in the comparison groups also remain stable over time. More generally, the companies in the comparison group are generally larger as they operate more frequent services and fly more passengers than the companies involved in both takeovers. This is due to the fact that the comparison group includes the FSAs. The comparison routes are also less concentrated. Such characteristics of the comparison groups suggest that the ability to raise fares should be reduced for the companies in such groups, as they face tougher competition and may have to keep fares low in order to achieve profitable load factors for a larger number of flights. This partly contrasts with the evidence in Table 3, showing a growing trend for fares in the comparison groups.

– Table 5 near here –

Having provided a descriptive analysis of the effects arising from both mergers, we now turn to an econometric evaluation of the effects on passenger fares that takes into account different flight characteristics in determining the impact on fares.

6. Econometric Methodology and Research Questions

To evaluate how fares changed in the acquired routes, we consider the takeover as a treatment that the routes received, and compare the fares in such a treated group with those from a comparison group of routes that did not receive the treatment. Formally, we use propensity score matching methods and a Differences-in-Differences (henceforth, "DID") approach to study whether the takeovers resulted in lower or higher fares for passengers. Both methodologies enable us to control for route specific factors that could not be taken into account in the above descriptive analysis. Furthermore, given the significance of inter-temporal price discrimination in the airline industry, a novel aspect of our approach is to distinguish between fares according to their booking days.

6.1 Propensity Score Matching

Let $A_{rijt} \in \{0,1\}$ be an indicator of whether route *r* operated by airline *i* is acquired by airline *j* in period *t.* Denote the number of months preceding the takeover (i.e., the number of months for which we observe fares for an acquired route) as *s*, and let $P^1_{ribc(t-s)}$ be the monthly mean or median fare posted by company *i* (the target firm) a number of days *b* (the booking day) before a flight's departure for flights on route *r* with characteristics *c* departing in each (*t*-*s*) month. Thus, $P^1_{rjbc(t-s+12)}$ identifies the fares for the same booking day posted twelve months later by the acquiring company *j* on route *r* for flights with characteristics *c*.[23] Denote the year-to-year percentage difference of monthly mean (or median) fares on acquired route *r*, as follows:

$$\Delta P^1_{rijbc} = \ln(P^1_{rjbc(t-s+12)}) - \ln(P^1_{ribc(t-s)}), \quad t = \begin{cases} 12/02 \; if \; Go\ Fly - Easyjet \\ 05/03 \; if \; Buzz - Ryanair \end{cases}; \quad s = \begin{cases} 1..7, if \; Go\ Fly - Easyjet \\ 2..10, if \; Buzz - Ryanair \\ -13..0, \; post - mergers \end{cases} \quad (1)$$

Differencing over the same months in different years deals with the presence of seasonal fluctuations, while the set of subscripts accounts for the heterogeneity arising from the airlines' yield management techniques and from flight characteristics. This procedure then allows us to take account of airlines setting their fares differentially across "booking days" (Giaume and Guillou, 2004; Pels and Rietveld, 2004). It also allows us to deal with other key differentiating factors. Specifically, we consider flight characteristics *c* as varying along three dimensions: 'Direction', indicating whether the flight goes from the UK to Continental Europe or vice versa; 'Week-End', if the flight departs on a week-end (Friday to Monday); 'Time of Departure', a three values discrete variable identifying flights that depart before 7.30am, between 7.30am and 7.30pm, and after 7.30pm. Because we consider fare changes over a twelve-month period, the inclusion of the latter characteristic appears crucial, as it prevents the possibility of mistakenly comparing fares for an early morning flight with fares a year

[23] The decision to control for the flights' characteristics is due to the possibility that they may change over time and thus invalidate comparisons.

later for a late evening flight. Furthermore, to base our analysis on reliable monthly statistics, the mean and the median fares were not calculated unless, for each month and each company, the group *rbc* included at least 7 observations.

Next, denote ΔP^0_{rijbc} as the year-to-year percentage difference in the monthly mean (or median) fares on route *r, had route r not been taken over*. The causal effect of the takeover on fares is then defined as:

$$\Delta P_{rijbc} = \Delta P^1_{rijbc} - \Delta P^0_{rijbc} \tag{2}$$

However, ΔP^0_{rijbc}, and therefore ΔP_{rijbc}, is unobservable because no individual route can be observed as both having, and not having, received the treatment. Following the microeconometric evaluation literature (Cameron and Trivedi, 2005), the average effect, conditioned by booking day, of a takeover on the fares in the acquired routes can be defined as:

$$\Delta P_\tau = E\left\{\Delta P^1_{rijbc} \mid A_{rji} = 1, b = \tau\right\} - E\left\{\Delta P^0_{rijbc} \mid A_{rji} = 1, b = \tau\right\} \tag{3}$$

The last term in (3) is still unobservable. To confront this missing data problem, matching techniques employ a counterfactual based on the selection of a valid comparison group from the data. The purpose of matching is to pair, for a given booking day, each acquired route with a counterfactual made up of a route that has not undergone any ownership change but that shares similar characteristics with the acquired routes. As discussed above, the comparison group includes all the routes that belong to the same city-pair of the acquired routes. Thus, the treated and the comparison group automatically share similar structural characteristics (e.g., route length), as well as some unobserved idiosyncratic shocks that may have occurred at the city-pair level.

Matching involves comparing acquired and non-acquired routes across a number of observable characteristics. In our estimation procedure using the STATA command 'nnmatch' described in Abadie et al. (2004), exact matching is specified for the characteristics: 'Period' (i.e., observations from the same month and year), 'Direction', 'Week-End' and 'Time of Departure'. Moreover, the propensity score proposed by Rosenbaum and Rubin (1983) provides a matching index that captures the information for other routes' and city-pairs' characteristics. The propensity score is calculated from the covariates listed in Table 6 and is used within the nearest-neighbour matching algorithm to identify two counterfactual matches for each ΔP^1_{rijbc}.[24]

– Table 6 near here –

[24] More formally, let P_A and P_C denote the propensity score in an acquired and non-acquired route, respectively. Conditional on obtaining an exact matching for the chosen characteristics, the set of *n* counterfactual matches satisfy $M_A(P) = \left\{C \mid \min_C \left\| P_A - P_C \right\|\right\}$. We set *n=2* to minimize the risk of spurious associations.

The values for *t* and *s* in (1) are consistent with the pre-and post-mergers periods in Tables 2 to 4. Thus, the above propensity score methodology applies also to the evaluation of the longer-term effects of the takeovers. In this case, the treated group comprises the acquired routes observed over a 25-month period beginning when the acquiring firms started their operations, while the comparison group is defined as before. Focarelli and Panetta (2003) argue that a short post-merger period might fail to account for a merger's long run efficiency gains due to the harmonization of the organizational practices between the two merging firms. Considering that Ryanair needed just a month to retrain Buzz's retained workforce, and that EasyJet presumably did the same without stopping the services it took over from Go Fly, a 25-month post-merger period is likely to be more than sufficient to capture each merger's full effect on fares. Indeed, previous studies in the airline industry have considered even shorter periods. In evaluating the impact of the Northwest/Republic and TWA/Ozark mergers in the US, Borenstein (1990) looks at the fares one year after the mergers took place, while Kim and Singal (1993) analyse the price changes one quarter after the two mergers' completion.[25]

6.1 Differences-in-Differences (DID) estimator

Following Cameron and Trivedi (2005), the DID estimator can be shown to be equivalent to the estimate of α_b in the OLS hedonic pricing regression on a sample including only observations for the same booking day:

$$P_{ribm} = X'_{rm}\beta_b + \delta_b DP + \gamma_b D_A + \alpha_b DP \cdot D_A + u_i \qquad (4)$$

where P_{ribm} denotes company *i*'s monthly mean (median) fare posted *b* days before a flight's departure for flights in route *r* departing in month *m*; X'_{rm} includes a constant, the flight's characteristics 'Direction', 'Week-End' and 'Time of Departure', plus the last three variables in Table 6; *DP* equals one in the post-takeover period; D_A equals one in the acquired routes.

Given the differing characteristics of the markets involved in the two takeovers (see above), regression (4) is run separately for each takeover. Furthermore, each takeover's sample is divided in two periods, one identifying the consolidation phase with fares of both the target and the acquiring firm, and the other contrasting the pricing behaviour of the acquiring firm to evaluate the long term implications of the takeovers.

Finally, in the application of both the Propensity Score and the DID methodology, it is essential to control for the variations in fares induced by the change in the capacity offered by an airline on a route. Indeed, the decision by the acquiring firm to, say, double the number of flights in a route is also likely to have obvious repercussions on its fare setting decisions. Therefore, in applying equations (3) and (4), we only considered those routes where the yearly percentage change in the total

[25] A notable exception is the study by Morrison (1996), which examines the impact of US airline mergers eight to nine years after they occurred. However, he acknowledges that with such lengths of time determining whether subsequent directions of prices were directly due to the mergers or other market developments (e.g. entry/exit patterns, changes in consumer demand, or cost conditions) is highly problematic.

number of flights operated by an airline remained below or equalled 25%.[26] Moreover, given the high correlation between number of flights and number of passengers, imposing such a threshold reinforces the results obtained using posted fares. Indeed, assuming that monthly demand conditions remain sufficiently stable year on year, controlling for an airline capacity in a route implies that a change in the composition and the level of fares can only be ascribed to a variation in the pricing schemes over a twelve-month period. Such a variation may be a direct consequence of the takeovers, when we compare the fares of the target and the acquiring firms; or of their longer term effects, when we consider the fares posted by the acquiring firms in the 25 months following the takeovers.

7. Evaluation of Merger Effects

7.1 Econometric Results

Using the Nearest Neighbour Propensity Score Matching estimator, Tables 7 and 8 reports the average effect of the takeover on the sample of treated routes for both mean and median yearly fare changes. Following Borenstein (1990) and Kim and Singal (1993), these Tables include, in round brackets, the same estimates weighted by the number of monthly passengers flown by an airline on a route. They also contrast possible differences in the effects observed during the consolidation phase and in the longer term.

– Tables 7 & 8 near here –

With regard to Ryanair's consolidation phase (shown in the first half of Table 7), the previous comments relating to Table 3 appear to be supported in respect of the takeover's impact. Indeed, the percentage change in fares posted one day from take-off from Buzz to Ryanair was between 28%-34.6% larger than in the comparison group, while weighted mean fares changes for bookings between 28 and 70 days were 43%-67% smaller. The effect is even stronger, for both increases and decreases, on median fares. Interestingly, the marked increase in late booking fares observed during the consolidation period is only partly reabsorbed in the longer term (see second half of Table 7), with Ryanair's weighted '1 Day' fares changing similarly to the comparison group, but with '4 Days' fares decreasing in relative terms by 14%-20%. More generally, the long run effects suggest a relatively smaller decrease in all fares, with the estimates for the weighted median fares generally appearing to be non-significant.

In contrast, the first half of Table 8 suggests that the takeover by EasyJet led to a direct, short-run decrease across all fares, which are particularly conspicuous for very early (56-70 Days) and late

[26] The use of the percentage change in the total number of passengers flown by an airline in the same months of two subsequent years yields similar results. Indeed, the percentage changes in the number of flights and passengers are highly correlated.

(1-10 Days) booking days. Critically, a similar pattern is revealed by the estimates for the overlap routes, although the decrease is of a smaller magnitude, indicating that EasyJet's enhanced competitive position in those routes may have led to smaller downward adjustments for fares.

In the two years following the takeover (see second half of Table 8), EasyJet's weighted median fares for late booking days in acquired routes increased, relative to the counterfactuals, by about 7%-11%, while no noticeable change is observed for all the other fares. For the overlapping routes, the increase for late booking fares is lower, while the early booking fares exhibit a tendency to fall (although by only about 5%).

Table 9 shows the DID estimates, which are largely consistent with the results in Table 7 and Table 8. In the consolidation phase, Ryanair's '1 Day' unweighted median fares increased by about £17.40 as a consequence of the takeover, while prices for earlier booking fell by between £11.00 and £35.70 depending on the booking day. Also, as far as the long-term effects are concerned, we observe a co-movement of the fares in the treated and the comparison groups, because the price adjustments are smaller in magnitude and often non-significant, especially for the weighted median case. In any case, even taking into account a possible increase in fixed charges of about £4.00, the evidence obtained by applying the DID indicates that the post-merger fares exhibit a steeper temporal profile, which was maintained also in the second year of operation.

– Table 9 near here –

EasyJet's takeover led to average savings for passengers of about £12.00-£31.00 during the consolidation phase, while median fares all fell by about £15.00-£32.00 across booking days. Again, such values are well above the possible increases in fixed charges. With regards to the longer-run effects of EasyJet's takeover, the findings suggest an increase of about £8.00-£11.00 for late booking fares which partly counteracts the fall in the consolidation phase. For instance, observe that in the January 2003-December 2004 period, the estimates for the late booking fares (up to '10 Days') are positive, while they are negative for early booking days. Taking into account the possible bias introduced by increases in fixed charges would not change the basic result that in the second year of EasyJet's operation, late booking fares slightly increased (after they had fallen in the first year) while early booking fares remained largely stable relative to those posted in the comparison group.

7.2 Discussion

Drawing on these results, we can make some observations in relation to the pricing strategy used the acquiring airlines, and specifically the possible theoretical reasons behind the intensification of the temporal pricing profile induced by the takeovers, and the impact on consumer welfare arising from the two takeovers.

On pricing strategy, the theoretical literature on inter-temporal price discrimination suggests various reasons why airlines might offer lower-priced seats to earlier purchasers. For instance, Gale and Holmes (1993) study the adoption of Advance-Purchase Discounts ("APD") when off-peak flights can be identified with certainty. They show that setting a low fare for the off-peak flight at an early, but not a late, stage induces travellers to self-select according to their preference for a peak or an off-peak flight. With demand uncertainty, Gale and Holmes (1992) show that APD can promote efficiency by spreading consumers evenly across flights before timing of the peak period is known. The implication is that, ex-post, both flight types will exhibit a monotonically increasing time profile. For competitive markets where firms set prices before demand is known, Dana (1998) shows that firms may offer APD because travellers with more certain demand and weaker departure time preferences are better off buying in advance due to the presence of other consumers with higher valuations and more uncertain demand. This is rational because the airlines commit to a rationing rule that limits the number of cheaper seats and thus reduces the incentive of consumers with more certain demand to postpone purchase.

In the context of the passenger airline travel, more certain demand and weaker preferences for the schedule convenience usually denote characteristics associated with the leisure travellers segment, to which the lower early fares posted by the LCAs seem to be mostly directed. Furthermore, the rapid expansion of travel possibilities in the European market has created a situation where leisure travellers may have a more elastic demand because they can substitute across a sizable number of equally attractive destinations, and choose those that are more competitively priced. In contrast, route substitutability may not matter so much for business customers, for whom travelling needs may arise quite unexpectedly and at short notice. Given their strong preference for schedule convenience, the high late booking fares appear to be meant for business customers (or the presumably rare, price insensitive leisure traveller).

One possible reason for the observed rise in late booking prices could be the acquiring firms exploiting increased monopoly power over business traveller because of a reduction in the number of direct substitutable routes. However, our findings suggest otherwise. As we show, most of the acquired routes were at best imperfect substitutes – i.e. different city or regional airports at departure or arrival. If anything, this might have been expected to hit leisure travellers harder by reducing their choice set. In the case of Ryanair, we can note that the effect of lower prices to early bookers and higher prices only for very late bookers is quite consistent across the acquired routes, i.e. whether they were close substitutes or not to existing routes. Accordingly, the most straightforward explanation for the change in prices on the acquired routes is that these simply followed the pricing formulae used on the existing routes, i.e. the price changes simply reflect the acquiring firm imposing its pricing model on the acquired routes rather than exploiting any enhanced market power.

In respect of the impact of the mergers on consumer welfare, we refer to the estimates in Table 9, which are more directly comparable as they are expressed in levels. Only the '1 Day' fares

increased significantly during the consolidation phase as a consequence of the Ryanair's acquisition: all the other fares fell. As only a small proportion of tickets are usually sold just a few days prior to departure, it appears that the takeover brought about significant increases in aggregate consumers surplus. Beyond the consolidation phase, savings for Ryanair's late booking passengers were also realized. These could be possibly due to efficiency gains resulting from cost synergies related to Ryanair's network expansion, to its strict adherence to the low-cost business model and to its ability to maintain enhanced levels of aircrafts' productivity through effective yield management and other marketing strategies (e.g., promotional efforts to stimulate demand on targeted routes). Overall, the evidence points strongly towards a beneficial, efficiency enhancing effect for the routes directly affected by this takeover.

The short-run effects of EasyJet's acquisition are more straightforward: there were savings for all types of travellers. However, a less clear-cut conclusion can be reached for the longer-run effects because an increase in the set of late booking fares has to be weighed against the decrease in early booking fares. Even so, notice how fare decreases are larger, and increases smaller for the weighted estimates, suggesting that larger decreases were observed when an airline transported a high number of passengers. Thus, mean and median weighted fares for the '1 Day' and the '4 Days' cases increased by about £6.00 and £4.00, while those posted between 49 and 28 days to a departure decreased by about £10.00. According to Barlow (2000), EasyJet sells about one-fifth of seats within the last 5 days from take-off, while about two-fifths of its load factor is realized between 45 and 10 days from departure.[27] Thus, it is very unlikely that the EasyJet's takeover determined a reduction in total consumer surplus on the acquired routes.

Finally, as a further argument to support the conclusion that both mergers had net beneficial effects in more general social welfare terms, notice that late booking fares are usually related to more inelastic demand. Their increase therefore has smaller total welfare effects, as it largely corresponds to a direct transfer from the consumers to the firm. Correspondingly, the lower fares for early bookers, who presumably are more price elastic, can represent a significant net increase in welfare as they afford an expansion in demand (as evidenced by the high post-merger loading factors and generally increased capacity).

[27] More generally on the pattern of typical booking profile of EasyJet ticket sales, see the 2003 annual report and accounts of EasyJet plc (p.13) (http://www.easyjet.com/common/img/FY2003EZJAnnualReportandAcconts.pdf). This indicates that around half of tickets sold occur between 6 and 1 weeks prior to departure and around 15% occur in the final week. For further evidence detaling specific EasyJet flights, see Koenigsberg et al. (2003), which similarly points to less than 15% of EasyJet tickets sold in the last seven days before flight departure.

8. Conclusions

According to Borenstein and Rose (2007, p.30), business-model experimentation, in pricing, logistics, competitive strategies and organizational form has been a key feature of the US airline industry following deregulation. Similarly, in this study, we argue that Low Cost Airlines, which have become key players in Europe after the civil aviation industry was fully liberalized in 1997, do not constitute a homogeneous strategic group, as their business models can differ markedly. A source of this difference may lie in the history of each airline. In this respect, both acquiring firms in this study operated as independent companies since their inception, pioneering in their own specific way the Southwest "no-frills" business approach in Europe; i.e., unlike both acquired firms, which were launched as subsidiaries of Full Service Airlines.

In our analysis of the two takeovers, we have focused primarily on fare structures as a critical differentiator in the firms' business models. To the extent that effective yield management systems enable a better alignment of the evolution of actual demand relative to forecast demand for individual flights, they constitute an important management and strategic tool. The evidence reveals that the acquiring firms have generally kept most fares below the pre-takeover period – the exception being for the fares posted only a few days before departure. Yet we have also looked at other aspects, beyond fares, that might have impinged on consumer welfare. Notably, a possible concern with the takeovers might have been that they would afford the acquiring firms increased market power that would have allowed them to reduce capacity and flight frequency on the acquired routes (in order to drive up prices). However, our findings show the acquiring firms either increasing or keeping the capacity and frequency of the flights operated on the acquired routes stable. Ryanair, for example, succeeded in increasing capacity and flight frequency while also raising the load factors on the acquired routes (suggesting both allocative and productive efficiency gains). Moreover, all these effects were realised within the first post-takeover year, suggesting that the takeovers led to the almost immediate assimilation of the target firms' business models in favour of those of the acquiring firms and that consumers gained as a consequence.

However, it is conceivable that the takeovers may have negatively impacted in other respects, such as on quality factors like punctuality and safety. Although these aspects are not directly analysed in this study, anecdotal evidence seems to run contrary to such a hypothesis. First, both acquiring firms feature prominently in the 2005 and 2006 league tables of the most punctual airlines operating in the UK based on CAA official data (see www.flightontime.info/index.html). Second, safety standards continue to be directly regulated in Europe (as well as in the US), hence the airlines are left with little discretion in this matter. Furthermore, airlines also perceive the incentive to build and maintain strong safety reputations as a prerequisite to attracting any passengers (Borenstein and Rose, 2007). This may actually confer a competitive advantage to both Ryanair and EasyJet, as they operate a very young (and therefore likely safer) fleet.

Our analysis thus supports the UK authorities' decision to allow both takeovers. On a more general level, though, the analysis suggests an approach to merger evaluation where the standard measurement of the post-merger market structure and conduct is considered together with an assessment of how likely it is that the character and associated competitive positioning of the acquiring firm's business model will also be applied to the acquired business. Such an approach seems to have been used, at least informally, by the European Commission ("EC") in its investigation on the takeover of Aer Lingus by Ryanair.[28] Yet, in blocking the merger, the EC's concerns about the increased market power of the acquiring firm and particularly diminished choice for Irish consumers appear to have overridden the possible opposing benefits from Ryanair's business model being applied to a wider geographical market, including competing against FSAs on intercontinental routes. Nevertheless, faced with continuing international regulatory restrictions and the need for scale economies, it appears likely that takeovers will remain a critical means by which successful LCAs can extend their market reach and present a stronger competitive challenge to FSAs, duly benefiting consumers in the process. [29]

[28] For instance, EU Competition Commissioner Neelie Kroes is quoted as saying: "… Monopolies are bad for consumers because they reduce choice, lower quality and give rise to higher prices. Low-cost carriers like Ryanair are no exception to this rule." – see "Commission prohibits Ryanair's proposed takeover of Aer Lingus", European Commission press release IP/07/893, 27 June 2007. Interestingly, the Commission's definition of both airlines as "low-cost" hints at its belief that few gains would accrue to consumers if Ryanair's business model were applied to Aer Lingus's routes.

[29] In contrast to the EC's decision to block Ryanair's takeover of Aer Lingus, the German Federal Cartel Office has allowed Air Berlin, Europe's third largest budget airline, to expand into the long-haul passenger business with the takeover of its German competitor LTU (see "Bundeskartellamt gibt Zusammenschluss Air Berlin/LTU frei", Bundeskartellamt press release, 8 August 2007). Although an obvious explanation for such a decision can be found in the much smaller market share enjoyed by the German merging entities, it is noteworthy that the takeover will constitute another instance of business-model experimentation, with a budget airline entering such long-haul destinations as New York and Las Vegas; a type of service traditionally operated by FSAs. In this case, it would seem that the German Authorities viewed with favour the replacement of a loss-making company's business model with that of a successful low-cost airline.

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Figure 1. Mean fares of target and acquiring firms on the routes directly affected by the takeovers, by booking day and period

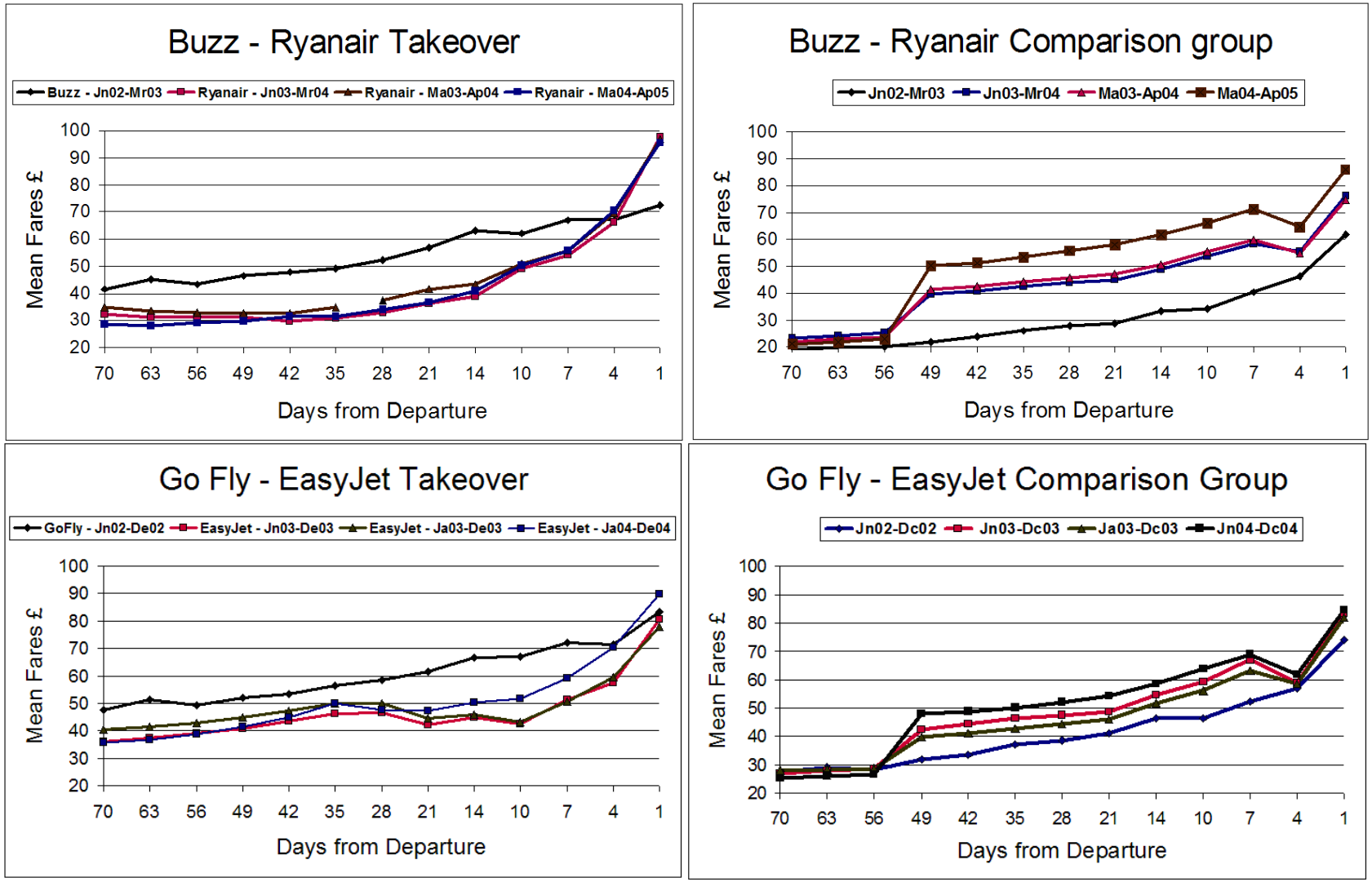
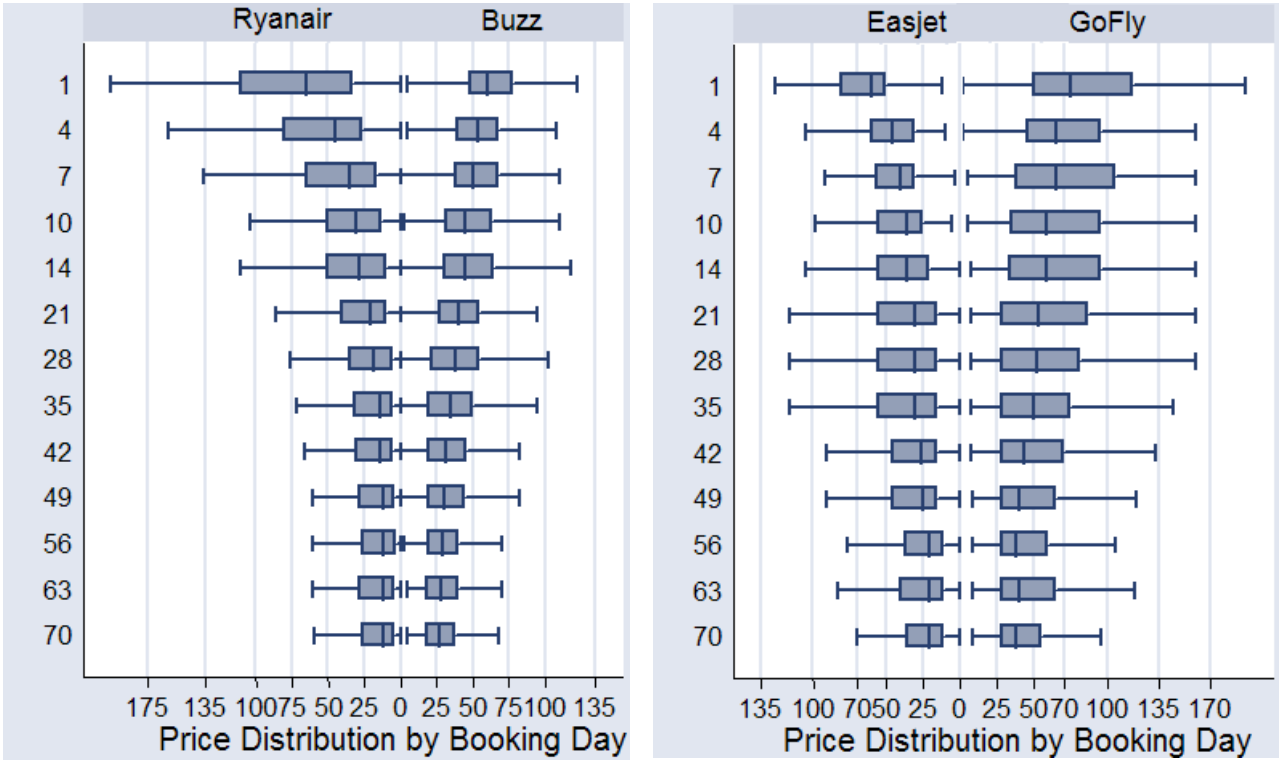


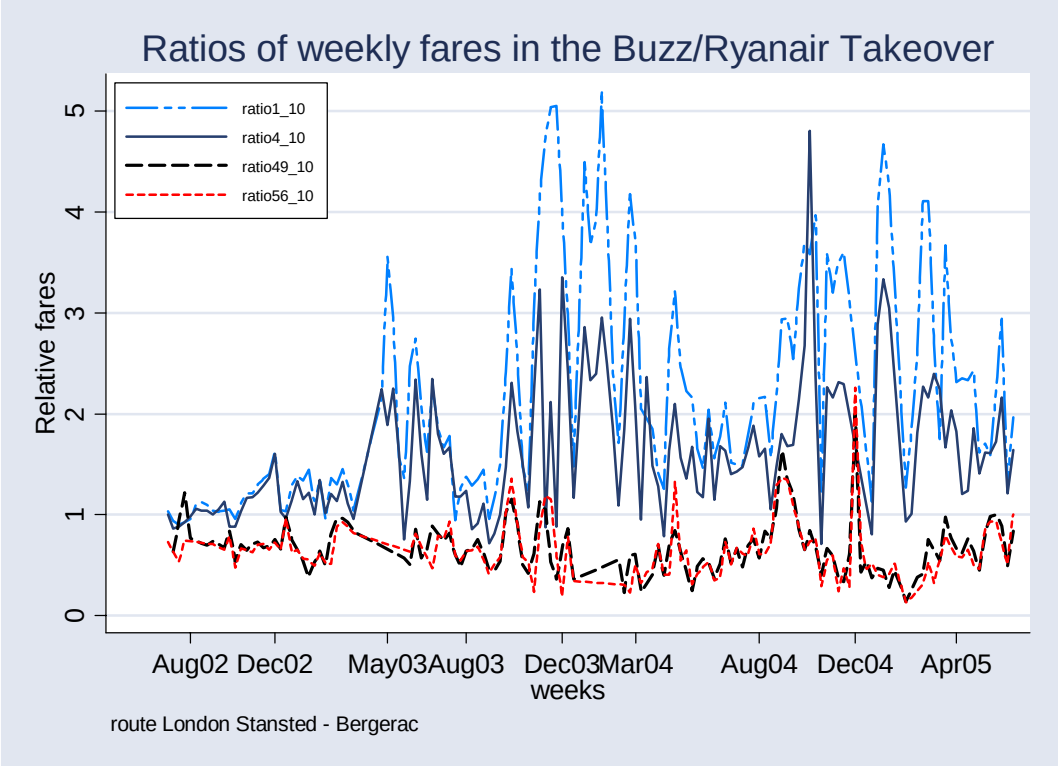
Figure 2. Comparison of the time profile of fare levels between the acquiring and the acquired company



Note: The Booking Day on the vertical axis indicates the number of days from take-off. The distribution of fares for Ryanair and EasyJet is drawn from the routes not directly affected by the takeovers. The two extremes represent the lowest and highest adjacent values, while the box reports the 25th percentile, the median and the 75th percentile values.

Figure 3. Ryanair/Buzz takeover – Evolution of weekly fares on an acquired route

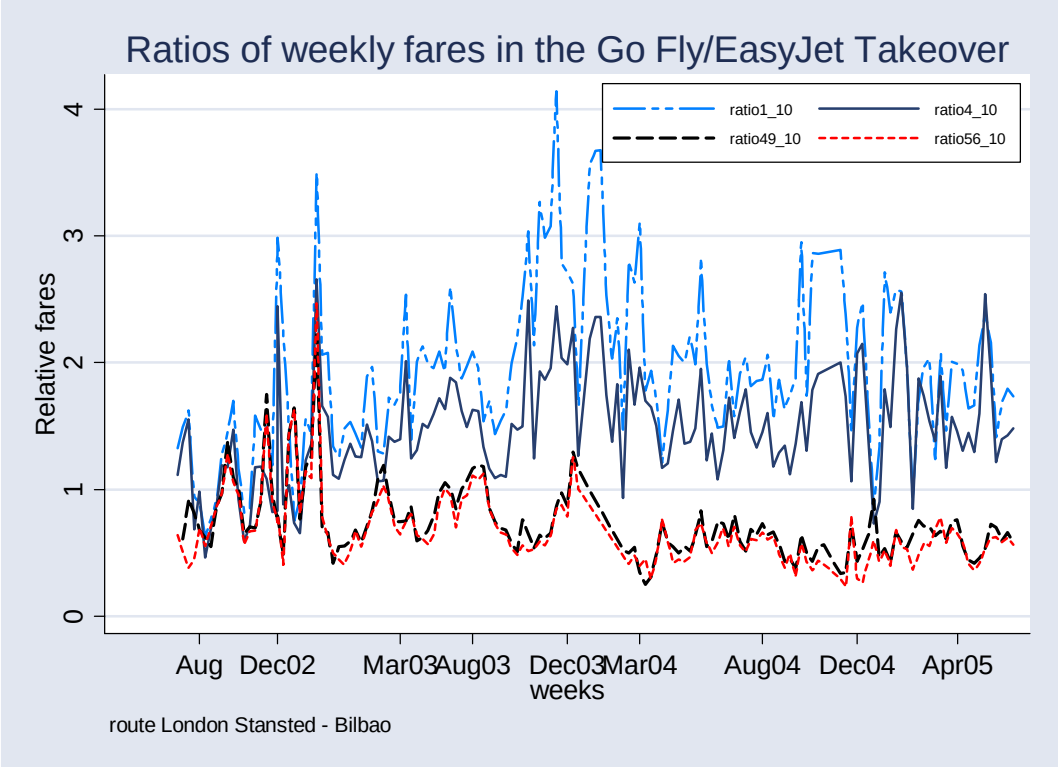
Fares normalized by the fares posted ten days from departure.



Note: Completion date for takeover is May 2003.

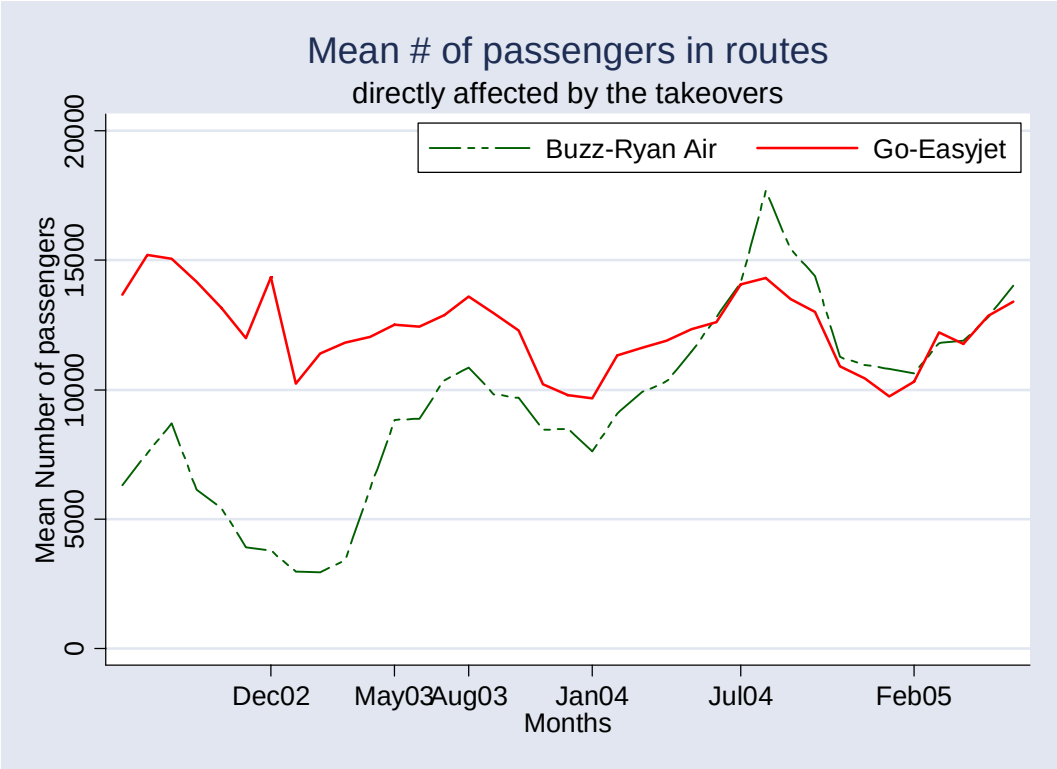
Figure 4. Go Fly/EasyJet takeover - Evolution of weekly fares on an acquired route

Fares normalized by the fares posted ten days from departure.



Note: Completion date for takeover is Dec 2002.

Figure 5. Seasonality in routes directly affected by the takeovers



Source: UK Civil Aviation Authority

Table 1. Routes directly involved in the two takeovers

Go Fly routes continued by EasyJet			Buzz routes from Stansted acquired by Ryanair		
Bristol to	East Midlands to	Stansted to	Continued to	Substituted with a Buzz or Ryanair alternative route	Terminated
Faro FAO	Faro FAO	Bilbao	Berlin SFX	Dusseldorf with Niederrhein (Ryanair)	Paris CdG
Glasgow GLA	Glasgow GLA	Bologna	Bergerac EGC	Frankfurt Intl with Frankfurt Hahn (Ryanair)	Amsterdam
Alicante ALC	Alicante ALC	Glasgow GLA	Brest - BES	Toulouse with Carcassonne (Ryanair)	Dijon
Malaga AGP	Malaga AGP	Alicante ALC	Tours TUF	Marseilles with Nimes (Ryanair)	
Nice NCE	Prague PRG	Ibiza IBZ	La Rochelle LRH	Toulon with Nimes (Ryanair)	
Palma PMI	Barcelona BCN	Malaga AGP	Limoges LIG	Caen with Dinard (Ryanair)	
Prague PRG	Venice VCE	Milan LIN	Poitiers PIS	Geneva with Grenoble (Buzz)	
Barcelona BCN		Munich MUC	Jerez XRY	Chambery with Grenoble (Buzz)	
Venice VCE		Naples NAP	Murcia MJV	Almeira with Murcia (Buzz)	
		Nice NCE	Grenoble GNB		
		Palma PMI			
		Prague PRG			
		Rome Ciampino			

Source: EasyJet website: http://www.easyJet.com/EN/About/Information/infopack_keyevents.html and Ryanair website: http://www.ryanair.com/site/EN/news.php?yr=03&month=feb&story=stm-en-260203.
Note: All continued routes are included in the analysis of the effects of the two takeovers, except Stansted-Grenoble, for which we overlooked to collect the fares posted by Ryanair after the takeover.

Table 2. Routes operated by the target and the acquiring firms that fully or partly overlapped at the time of the takeovers

Route of target	Full Overlap	Partial Overlap	
Go Fly-EasyJet			
EMA-AGP*		LPL-AGP	
EMA-BCN*		LPL-BCN	
STN-BFS		LTN-BFS	
STN-EDI		LTN-EDI	LGW-EDI
STN-ALC*		LGW-ALC	
STN-AGP*		LTN-AGP	LGW-AGP
STN-NCE*		LTN-NCE	LGW-NCE
STN-PMI*		LTN-PMI	LGW-PMI
STN-BCN*		LTN-BCN	LGW-BCN
EDI-BFS	EDI-BFS		
GLA-BFS	GLA-BFS		
Buzz-Ryanair			
STN-BES*		STN-DNR	
STN-CFR		STN-DNR	
STN-MRS		STN-MPL	STN-FNI
STN-TLN		STN-FNI	
STN-TLS		STN-CCF	
STN-DUS		STN-NRN	
STN-FRA		STN-HHN	

Note: EMA=East Midlands; AGP=Malaga; LPL=Liverpool; BCN=Barcelona; STN=London Stansted; BFS=Belfast Intl.; EDI=Edinburgh Intl.; LGW=London Gatwick; ALC=Alicante; NCE=Nice; PMI=Palma Majorca; GLA=Glasgow Intl.; BES=Brest; DNR=Dinard; CFR=Caen; MRS=Marseilles; MPL=Montpellier; FNI=Nimes; TLN=Toulon; TLS=Toulouse; CCF=Carcassonne; DUS=Dusseldorf; NRN=Niederrhein; FRA=Frankfurt Intl.; HHN=Frankfurt Hahn. * Overlap routes that are further analysed in the study.

Table 3. Mean values of fares in the pre- and post-takeovers periods.

		Buzz → Ryanair		**Ryanair → Ryanair**		**Go Fly → EasyJet**		**EasyJet → EasyJet**	
Routes type	Days	Before - Jun02/ Mar03	After - Jun03/ Mar04	1st year May03/ Apr04	2nd year May04/ May05	Before - Jun02/ Dec02	After - Jan03/ Dec03	1st year Jan03/ Dec03	2nd year Jan04/ Dec04
Comparison	1	61.8	76.3	74.8	85.9	74.0	83.5	82.1	84.5
Acquired	1	72.5	97.6	96.7	95.5	83.2	80.7	77.8	89.8
Comparison	4	46.2	55.3	54.9	64.6	57.1	59.0	58.6	61.8
Acquired	4	67.0	66.3	69.8	70.6	71.4	57.6	59.5	70.5
Comparison	7	40.5	58.4	59.7	71.2	52.3	67.0	63.2	68.9
Acquired	7	66.8	54.2	55.7	55.7	72.2	51.3	50.8	59.3
Comparison	10	34.1	53.6	55.4	65.9	46.5	59.3	56.2	63.7
Acquired	10	62.1	49.3	51.1	50.2	67.1	42.5	43.0	51.6
Comparison	14	33.4	48.6	50.6	61.8	46.5	54.7	51.8	58.5
Acquired	14	63.1	38.9	43.4	40.8	66.8	44.9	45.9	50.3
Comparison	21	28.6	44.8	46.9	57.8	41.1	48.8	46.0	54.3
Acquired	21	56.8	36.3	41.4	36.6	61.7	42.0	44.5	47.1
Comparison	28	27.8	43.8	45.5	55.7	38.7	47.5	44.3	52.0
Acquired	28	52.5	32.8	37.4	34.0	58.4	46.7	49.8	47.7
Comparison	35	26.0	42.6	44.1	53.3	37.1	46.4	42.9	50.1
Acquired	35	49.3	30.9	35.0	31.4	56.5	46.3	50.1	46.8
Comparison	42	23.7	40.8	42.4	51.2	33.5	44.3	41.2	48.8
Acquired	42	47.7	29.7	32.4	31.4	53.2	43.6	47.2	44.7
Comparison	49	21.8	39.8	41.3	50.1	31.9	42.6	39.7	48.0
Acquired	49	46.4	31.1	32.4	29.7	52.0	40.9	44.8	41.5
Comparison	56	19.9	25.2	23.6	22.9	28.3	28.5	28.7	26.6
Acquired	56	43.4	31.3	32.7	29.1	49.3	38.9	42.7	38.6
Comparison	63	19.7	24.1	22.7	21.6	29.1	27.8	28.4	26.1
Acquired	63	44.9	31.3	33.4	28.1	51.3	37.4	41.5	36.7
Comparison	70	18.8	23.2	21.9	20.9	27.5	27.1	28.1	25.3
Acquired	70	41.4	32.2	35.0	28.6	47.6	36.1	40.3	35.8

Note: For each merger, the comparison sample includes only the routes that are part of the city-pairs where the acquired company, and then the acquirer, operated.

Table 4. Routes and market (city-pairs) characteristics for the routes and city-pairs involved in the takeovers

	Buzz → Ryanair		Ryanair → Ryanair		Go Fly → EasyJet		EasyJet→EasyJet	
Mean Values	Jun02-Mar03	Jun03-Mar04	May03-Apr04	May04-May05	Jun02-Dec02	Jun03-Dec03	Jan03-Dec03	Jan04-Dec04
Flights per company in route	62.8	77.3	77.5	87.9	114.3	101.3	100.5	99.7
Passengers per company in route	5282	9504	9558	13064	13875	12024	11851	12142
Average Load Factor	84.0	123.0	123.3	148.6	121.4	118.7	117.9	121.8
Route Herfindhal (flights)†	0.96	0.94	0.94	0.92	0.85	0.86	0.86	0.87
Route Herfindhal (passengers)†	0.96	0.94	0.94	0.93	0.86	0.87	0.87	0.88
Companies in Route	1.08	1.13	1.13	1.15	1.31	1.30	1.30	1.30
City-pair (flights) Herfindhal†	0.83	0.83	0.83	0.78	0.46	0.42	0.43	0.41
City-pair (passen) Herfindhal†	0.83	0.83	0.83	0.78	0.47	0.43	0.44	0.42
Relative City-pair size*	0.08	0.08	0.08	0.09	0.26	0.23	0.24	0.23
N Routes in Citypair	1.63	1.81	1.81	2.20	3.24	3.79	3.64	3.91
N Companies in City-pair	1.94	1.81	1.81	2.06	3.50	3.43	3.38	3.44

Source: U.K. Civil Aviation Authority. Note: For the Buzz-Ryan Air case, the routes discontinued by Ryan Air were not taken into account in the calculation of the mean values in the June02-March03 period.

† Market shares calculated using either the number of monthly flights per company or the number of monthly passengers per company.

*To obtain "Relative City-pair Size" the UK, Italy, France, Germany and Spain were divided into three sub-areas: North, Centre and South. The variable is calculated as the share of total flights in a city-pair (say, London to Rome) over the total flights connecting the sub-area in the UK with the sub-area in the country of the other city-pair endpoint (i.e., from the South of the UK to the Centre of Italy as the sub-areas where London and Rome are respectively located). For smaller countries, the denominator is given by taking the whole country.

Table 5. Routes and market (city-pairs) characteristics distinguished by the set of routes directly involved in the takeovers and the comparison routes

	Buzz → Ryanair						Go Fly → EasyJet					
	Jun02-Mar03		May03-Apr04		May04-Jun05		Jun02-Dec02		Jan03-Dec03		Jan04-Jun05	
Mean Values	Compa-rison	Direct	Compa-rison	Direct	Compa-rison	Direct	Compa-rison	Direct	Compa-rison	Direct	Compa-rison	Direct
Flights per company in route	158.6	62.8	139.5	77.5	139.3	87.9	175.5	114.3	161.4	100.5	145.7	98.2
Passengers per company in route	17599	5282	16120	9558	17424	13144	17865	13875	16639	11851	15565	12000
Average Load Factor	111.0	84.0	115.6	123.3	125.1	149.5	101.8	121.4	103.1	117.9	106.8	122.2
Route Herfindhal (flights) †	0.75	0.96	0.75	0.94	0.80	0.92	0.75	0.85	0.78	0.86	0.80	0.87
Route Herfindhal (passeng.) †	0.76	0.96	0.76	0.94	0.80	0.93	0.76	0.86	0.79	0.87	0.80	0.88
Companies in Route	1.62	1.08	1.57	1.13	1.47	1.15	1.59	1.31	1.52	1.30	1.51	1.28

Source: U.K. Civil Aviation Authority. Note: For the Buzz-Ryan Air case, the routes discontinued by Ryan Air were not taken into account in the calculation of the mean values in the June02-March03 period. The comparison group is made up of the other routes that are part of the same city-pair of the routes involved in the takeovers.

†Market shares calculated using either the number of monthly flights per company or the number of monthly passengers per company.

Table 6. Covariates used to calculate propensity scores

Variable	*Description*
Route Herfindhal	Herfindhal Index with route's shares calculated using a company's number of flights. See Tables 4 and 5 for statistics.
Route Length	Expressed in miles
N UK airports connected to the arrival airport.	The number of UK origin airports offering flights to the arrival airport.
Relative city-pair size*	See Tables 4 for statistics
N Routes in City-pair	Number of routes within a city-pair. See Table 4 for statistics.

*To obtain "Relative City-pair Size" the UK, Italy, France, Germany and Spain were divided into three sub-areas: North, Centre and South. The variable is then calculated as the share of total flights in a city-pair (say, London to Rome) over the total flights connecting the sub-area in the UK with the sub-area in the country of the other city-pair endpoint (i.e., from the South of the UK to the Centre of Italy as the sub-areas where London and Rome are respectively located). For smaller countries, the denominator is given by taking the whole country.

Table 7. Nearest Neighbor Matching Estimates – Average Treatment Effect for the Treated – Weighted estimates in round brackets. Buzz/Ryan Air takeover

Variable: % Change in Monthly Mean or Median fares

	Buzz → Ryanair		**Ryanair → Ryanair**	
Starting period/ End period	Jun02-Mar03/ Jun03-Mar04/		May03-Apr04/ May04-May05	
Booking Day	Mean	Median	Mean	Median
1 Day	34.6[a]	36.3[a]	-10.5[a]	-9.2[c]
	(28.0)[a]	(28.9)[a]	(-1.8)	(-0.2)
4 Days	9.0[b]	4.5	-20.8[a]	-20.6[a]
	(2.9)	(3.5)	(-14.5)[a]	(-18.0)[a]
7 Days	-7.5[c]	-15.4[a]	-19.4[a]	-14.5[a]
	(-13.1)[a]	(-18.6)[a]	(-15.6)[a]	(-6.8)
10 Days	-11.0[b]	-29.9[a]	-17.2[a]	-10.2[b]
	(-15.0)[a]	(-29.1)[a]	(-12.7)[a]	(-4.5)
14 Days	-24.5[a]	-47.2[a]	-23.4[a]	-21.6[a]
	(-22.8)[a]	(-43.2)[a]	(-17.4)[a]	(-8.3)
21 Days	-28.9[a]	-46.4[a]	-21.1[a]	-25.2[a]
	(-23.8)[a]	(-38.4)[a]	(-15.5)[a]	(-24.8)[a]
28 Days	-43.4[a]	-59.5[a]	-8.3[b]	-7.4
	(-43.5)[a]	(-54.7)[a]	(-6.2)	(-8.7)
35 Days	-48.3[a]	-61.8[a]	-11.8[a]	-11.2[c]
	(-48.9)[a]	(-61.8)[a]	(-10.3)[c]	(-11.2)[c]
42 Days	-49.9[a]	-48.0[a]	-7.7	-6.8
	(-58.4)[a]	(-63.5)[a]	(-7.8)	(-4.9)
49 Days	-49.6[a]	-41.3[a]	-9.5[c]	-14.0[c]
	(-59.6)[a]	(-53.7)[a]	(-9.0)	(-15.2)[c]
56 Days	-50.3[a]	-37.3[a]	-12.0[b]	-20.0[a]
	(-66.7)[a]	(-51.0)[a]	(-12.7)[b]	(-18.9)[b]
63 Days	-56.2[a]	-49.3[a]	-17.6[a]	-16.2[a]
	(-65.6)[a]	(-59.8)[a]	(-14.4)[a]	(-16.0)[b]
70 Days	-54.4[a]	-45.3[a]	-6.6	-7.5
	(-67.3)[a]	(-54.2)[a]	(-9.3)[c]	(-7.5)
N	2138		5439	

Note: Propensity Score evaluated using the covariates in Table 5. Exact matching variables: 'Period', 'Direction', 'Week-End' and 'Time of Departure'. Weights: Number of company *i*'s monthly passengers on a route. [a, b, c] significant at the 1%, 5% and 10% level, respectively.

Table 8. Nearest Neighbour Matching Estimates – Average Treatment Effect for the Treated – Weighted estimates in round brackets. Go Fly/EasyJet takeover

Variable: % Change in Monthly Mean or Median fares

	Go Fly → EasyJet			**EasyJet → EasyJet**		
Starting period/ End period	Jun02-Dec02/ Jun03-Dec03			Jan03-Dec03/ Jan04-Dec04		
Booking Day	Mean	Median	Mean Overlap	Mean	Median	Mean Overlap
1 Day	-22.8[a]	-26.4[a]	-11.9[a]	12.7[a]	12.6[a]	5.6[a]
	(-22.3)[a]	(-28.8)[a]	(-10.2)[a]	(10.7)[a]	(10.8)[a]	(6.0)[a]
4 Days	-25.8[a]	-24.5[a]	-22.5[a]	11.8[a]	15.0[a]	3.7[c]
	(-28.6)[a]	(-31.3)[a]	(-18.4)[a]	(9.3)[a]	(11.2)[a]	(3.4)
7 Days	-22.8[a]	-15.8[a]	-25.5[a]	9.8[a]	12.8[a]	1.7
	(-22.6)[a]	(-17.8)[a]	(-24.1)[a]	(6.3)[a]	(7.0)[a]	(1.8)
10 Days	-28.2[a]	-20.2[a]	-32.4[a]	9.8[a]	11.8[a]	2.3
	(-28.8)[a]	(-23.5)[a]	(-31.8)[a]	(6.1)[a]	(6.8)[a]	(2.9)[b]
14 Days	-23.7[a]	-19.7[a]	-20.7[a]	7.0[a]	10.3[a]	0.3
	(-25.0)[a]	(-22.1)[a]	(-17.6)[a]	(3.2)[b]	(4.0)[c]	(-1.5)
21 Days	-21.7[a]	-18.2[a]	-19.5[a]	3.8[a]	3.9[c]	1.1
	(-21.1)[a]	(-19.7)[a]	(-16.7)[a]	(0.8)	(0.8)	(-0.5)
28 Days	-13.5[a]	-12.4[b]	-13.2[a]	-2.3[c]	1.6	-2.1
	(-14.5)[a]	(-16.3)[a]	(-10.3)[a]	(-4.2)[a]	(-0.5)	(-3.6)[a]
35 Days	-17.3[a]	-17.7[a]	-10.2[a]	-1.1	1.9	-1.5
	(-19.3)[a]	(-21.5)[a]	(-6.3)[c]	(-1.7)	(0.2)	(-2.2)
42 Days	-21.5[a]	-24.4[a]	-14.7[a]	1.2	3.1	-4.1[a]
	(-23.5)[a]	(-30.9)[a]	(-9.7)[a]	(1.4)	(0.1)	(-4.9)[a]
49 Days	-30.8[a]	-37.7[a]	-16.0[a]	1.8	3.3[c]	-4.7[a]
	(-29.8)[a]	(-39.4)[a]	(-8.0)[b]	(1.8)	(2.1)	(-5.0)[a]
56 Days	-33.7[a]	-42.4[a]	-27.9[a]	4.0[a]	5.2[a]	-5.0[a]
	(-34.7)[a]	(-43.3)[a]	(-23.6)[a]	(4.0)[b]	(3.8)[c]	(-5.0)[a]
63 Days	-40.1[a]	-52.0[a]	-30.4[a]	3.6[b]	4.7[b]	-4.7[a]
	(-41.1)[a]	(-56.6)[a]	(-25.3)[a]	(2.8)[c]	(-0.4)	(-4.6)[a]
70 Days	-46.6[a]	-58.0[a]	-34.2[a]	3.5[b]	4.9[b]	-4.9[a]
	(-49.6)[a]	(-66.7)[a]	(-27.9)[a]	(2.3)	(1.6)	(-4.8)[a]
N	8893		3866	39925		10772

Note: Propensity Score evaluated using the covariates in Table 5. Exact matching variables: 'Period', 'Direction', 'Week-End' and 'Time of Departure'. Overlap routes are shown in Table 1. Weights: Number of company *i*'s monthly passengers on a route. [a, b, c] significant at the 1%, 5% and 10% level, respectively.

Table 9. Difference-in-Difference estimates (Weighted estimates in round brackets).

Variable: Change in fare levels (£) between the starting and the end period

	Buzz→Ryanair		**Ryanair→Ryanair**		**Go Fly→EasyJet**		**EasyJet→EasyJet**	
Starting period/ End period	Jun02-Mar03/ Jun03-Mar04/		May03-Apr04/ May04-May05		Jun02-Dec02/ Jun03-Dec03		Jan03-Dec03/ Jan04-Dec04	
Booking Day	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1 Day	13.9[b]	17.4[a]	-7.2[b]	-6.2	-12.0[a]	-14.8[a]	10.6[a]	9.6[a]
	(6.6)	(10.5)[c]	(-4.6)	(-3.9)	(-18.6)[a]	(-22.7)[a]	(6.6)[a]	(6.2)[a]
4 Days	-7.4	-7.0	-6.9[b]	-7.1[b]	-15.7[a]	-17.0[a]	8.7[a]	8.0[a]
	(-12.8)[a]	(-11.3)[b]	(-5.5)[c]	(-5.9)[c]	(-18.3)[a]	(-20.9)[a]	(4.4)[a]	(3.9)[b]
7 Days	-23.1[a]	-23.5[a]	-2.9	-4.1	-26.2[a]	-27.9[a]	8.0[a]	7.3[a]
	(-32.3)[a]	(-30.6)[a]	(-1.8)	(-3.6)	(-30.7)[a]	(-32.4)[a]	(0.6)	(0.0)
10 Days	-22.4[a]	-24.0[a]	-4.0[c]	-1.9	-27.1[a]	-25.8[a]	6.3[a]	5.0[a]
	(-28.1)[a]	(-28.5)[a]	(-2.4)	(-0.9)	(-31.0)[a]	(-30.2)[a]	(-0.6)	(-1.4)
14 Days	-29.2[a]	-31.3[a]	-6.0[a]	-4.6[b]	-22.1[a]	-21.7[a]	3.1[a]	2.3[b]
	(-34.2)[a]	(-35.7)[a]	(-5.2)[b]	(-4.5)[c]	(-26.5)[a]	(-26.4)[a]	(-4.0)[a]	(-4.7)[a]
21 Days	-25.8[a]	-27.9[a]	-6.3[a]	-5.9[a]	-19.6[a]	-19.6[a]	0.2	-0.4
	(-30.2)[a]	(-30.6)[a]	(-5.3)[b]	(-5.3)[b]	(-21.9)[a]	(-22.4)[a]	(-7.2)[a]	(-7.6)[a]
28 Days	-23.4[a]	-24.3[a]	-0.1	0.6	-11.8[a]	-12.1[a]	-2.7[a]	-2.5[b]
	(-27.4)[a]	(-27.1)[a]	(0.8)	(0.9)	(-14.5)[a]	(-14.7)[a]	(-9.6)[a]	(-9.2)[a]
35 Days	-23.5[a]	-25.4[a]	-0.8	-1.1	-13.2[a]	-14.3[a]	-3.0[a]	-3.1[a]
	(-29.4)[a]	(-31.3)[a]	(0.9)	(0.1)	(-15.2)[a]	(-15.6)[a]	(-9.7)[a]	(-9.6)[a]
42 Days	-24.2[a]	-24.2[a]	2.4	1.9	-14.6[a]	-15.6[a]	-2.5[b]	-2.2[b]
	(-28.7)[a]	(-28.6)[a]	(2.9)	(2.2)	(-16.4)[a]	(-17.1)[a]	(-9.1)[a]	(-8.5)[a]
49 Days	-17.2[a]	-16.4[a]	2.3	2	-17.1[a]	-18.5[a]	-3.5[a]	-4.0[a]
	(-26.2)[a]	(-25.2)[a]	(1.3)	(0.7)	(-18.4)[a]	(-19.7)[a]	(-9.7)[a]	(-9.6)[a]
56 Days	-11.9[a]	-11.3[a]	0.4	0.2	-13.0[a]	-13.8[a]	-2.5[a]	-2.9[a]
	(-12.7)[a]	(-11.0)[b]	(2.3)	(2.0)	(-14.0)[a]	(-14.3)[a]	(-4.0)[a]	(-4.2)[a]
63 Days	-15.7[a]	-14.1[a]	-0.6	-3	-13.6[a]	-15.8[a]	-2.3[a]	-2.7[a]
	(-19.5)[a]	(-17.0)[a]	(1.3)	(-1.5)	(-17.3)[a]	(-19.7)[a]	(-3.6)[a]	(-3.7)[a]
70 Days	-13.4[a]	-12.8[a]	-3.1	-3.5[c]	-14.0[a]	-15.9[a]	-2.2[b]	-2.7[a]
	(-17.2)[a]	(-15.7)[a]	(-1.8)	(-2.4)	(-16.7)[a]	(-18.5)[a]	(-3.2)[a]	(-3.7)[a]
N	7,294		21,035		33,014		115,720	

Note: For each merger, the comparison sample includes only the routes that are part of the city-pairs where the acquired company, and then the acquirer, operated. The Diff-in-Diff estimates derive from OLS regressions including a number of regressors which are detailed in the article. The full set of estimates is available upon request. Weights: Number of company *i*'s monthly passengers on a route.