# Distributional Effects of Mergers: Evidence from the Attempted JetBlue-Spirit Merger*

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**Abstract**

In 2024, the attempted merger between JetBlue Airways and Spirit Airlines was blocked following a lawsuit brought by the Department of Justice. This paper estimates the counterfactual pricing effects that would have resulted from this merger. I find minimal impacts to average market prices under more favorable simulations and negative impacts to the average market fare of under 5% under the worst case scenario. Furthermore, I analyze the change in the overall distribution of fares had the merger been completed. I find that even under the assumptions most favorable to pro-competitive effects from merger, I estimate that over 35 markets in both the three years before and after the pandemic would have had their minimum fares increase by over $60. This represents a large increase in fares for highly price-conscious consumers, aligning with the judgment which prevented the merger. As such, my results are consistent with the need for careful analysis of the entire price distribution when examining the mergers of firms targeting consumers at risk of becoming price-constrained.

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Keywords: airlines; mergers; antitrust

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# 1 Introduction

Horizontal mergers between firms in the same industry can create a more efficient firm through the realization of economies of scale, the shifting of assets to more productive uses, and the sharing of productive technology (Williamson, 1968; Farrell and Shapiro, 1990; Kaplow, 2025). However, horizontal mergers necessarily reduce competition as the two formerly competitive firms now operate under full coordination with each other (Stigler, 1964). As such, horizontal mergers ambiguously change both consumer and societal welfare. Incorporating this insight into public policy, virtually all anti-trust regulators operate under the "consumer welfare" standard for approving mergers: for regulators to approve mergers that represent large reductions in competition, the merging firms must demonstrate efficiencies sufficient to offset the impulse to raise prices and harm consumers (Whinston, 2007).

Firms within a single industry may specialize their products on serving certain segments of customers based on consumer preferences or willingness to spend. Within the aviation industry, the latter of these drives a good deal of specialization, with major firms operating under one of three business models, the legacy business model, the low-cost carrier model, and the ultra-low cost carrier model.

In 2022, JetBlue Airways, a low-cost carrier, attempted to acquire Spirit Airlines, the largest ultra-low cost carrier in the United States. Notably, JetBlue indicated its desire to retire Spirit's business model targeting extremely price-conscious travelers. This motivated the Department of Justice to sue to block the merger. In his decision, Judge William G. Young chose to block the merger due to the belief that these particular consumers would face harm from the merger and as such the merger would violate the Clayton Act (William G. Young, 2024). My paper estimates the counterfactual pricing effects of the JetBlue-Spirit merger to examine the effects of the merger in more detail.

As the JetBlue-Spirit merger was never completed, I use structural modeling to estimate the pricing effects that would have been realized had the merger been completed. I first model supply and demand for air travel products within the continental United States. I estimate demand using a random coefficient nested logit model and supply as being using Bertrand Competition. This allows me to recover product level marginal costs which I then use simulate the merger effects across three separate specifications which can be thought of as a "best case" for the merger, an "average case" for the merger, and a "worst case" for the merger. To check the robustness of my results to the impact of the concurrent Northeast Alliance between JetBlue and American Airlines, I conduct these analyses separately on two samples: one consisting of the three years prior to the COVID-19 pandemic and one consisting of the two years following the resumption of mass air travel in 2021 following widespread vaccine availability.

I estimate that the average markets with both firms would have seen substantial declines in average prices within the best case simulation and only minor increases of between 4-5% under the other two simulations. However, I estimate that under all three scenarios, at least thirty-five markets in each period would have experienced increases in the minimum market fare of at least $60. Under the worst-case scenario, this number increases to over two hundred markets within each sample. This is notably consistent with the judicial ruling despite my sample excluding Puerto Rican, which were identified as being particularly vulnerable to price increases had the merger been approved. It is worth noting that the base fares offered by Spirit Airlines are typically among the cheapest available. In line with this, I examine the change in the minimum fare available within JetBlue-Spirit markets within my simulations.

The existing literature is divided on the net price effects of the wave of mergers that have occurred within the aviation industry since the turn of the century. This division is due to differences in both merger characteristics and study methodology. To understand the impact of different methodologies on the estimated pro- or anti-competitive price effects, consider Luo (2014) and Carlton et al. (2019). These papers estimate pro-competitive effects of the United-Continental merger by using a differences-in-differences inference design which relies on the determination of pre- and post-periods. By contrast, Fan (2020) finds evidence for price increases following this merger through the adoption of a model that allows for the realization of dynamic price effects following mergers. The dynamic price effects model provides evidence consistent with prices rising following key merger milestones other than completions. Research, such as Bet (2021b); Ciliberto et al. (2021), using structural modeling to recover firm marginal costs and markups to analyze the effects of these mergers has found similarly mixed evidence for the effects of mergers. Bet (2021b) found evidence for increases in markups resulting from the United-Continental, Southwest-AirTran, and American-US Airways mergers but not the Delta-Northwest merger due to limited efficiency gains across these mergers. Ciliberto et al. (2021) estimated the effects of the American-US Airways merger using a structural model allowing for firms to reposition their product offerings following the completion of the merger. Through this model, they estimate price increases of around 5% for duopoly markets consolidated by the merger. This is similar to my estimates for the average JetBlue-Spirit market under the "average case" and "worst case" simulations despite these firms' smaller market shares. However, I build further on this by estimating how the entire distribution of fares would change, and find that minimum market fares would have faced higher increases had the merger been approved.

Finally, through the use of more recent data, I examine the evolution of the aviation industry through the period following the COVID-19 pandemic. I find that despite the documented decline in business travel caused by the pandemic, demand only became slightly more elastic post-pandemic, consistent with research estimating less price sensitivity among leisure travelers post-pandemic (Ewen, 2023). Furthermore, I document changes in the role that low-cost carriers and ultra-low cost carriers play within the industry.

Historically, low-cost carriers and ultra-low cost carriers have only rarely competed in the same markets (Ciliberto et al., 2021). Despite this, within my sample, there exists a market with more than two low-cost carriers for every two markets with only a single low-cost carrier within it. This is consistent with the large growth of these carriers over the course of the previous decade.

With these findings outlined, I will briefly discuss the structure of the remainder of the paper. Section 2 details the relevant features of the consumer aviation market, as well as the proposed JetBlue-Spirit merger. Section 3 elaborates on my data sources and presents summary statistics. Section 4 contains my analysis of the JetBlue-Spirit merger and includes separate subsections for the demand model (section 4.1), supply model (section 4.2), and my simulation results (section 4.3). I briefly conclude my paper in section 5 with a brief discussion of the findings of this paper and examination of their implications for antitrust policy.

# 2 Empirical Setting

## 2.1 United States Aviation Industry

There are three types of major firms within the American aviation: legacy carriers, low-cost carriers, and ultra-low cost carriers. This paper studies a proposed merger between JetBlue (a low-cost carrier) and Spirit (an ultra-low cost carrier). As such, it is worth spending time on these differences, as they inform later analyses within this paper.

Legacy carriers are those firms that operated air service between states before fare deregulation in 1978. Following a series of mergers in the last few decades, Delta, American, and United are the only legacy carriers still operating today. These carriers operate hub-and-spoke route networks which require customers to connect through centralized hub airports to reach smaller destinations. Due to operating in markets in various sizes, these firms operate fleets comprised of more varied air craft than the other carrier types. While these varied fleets allow for the servicing of smaller markets with lower excess capacity than if they flew uniform fleets, the additional variety in aircraft leads to additional crew training and maintenance expenditures.

Non-legacy air carriers are divided into two groups, low-cost carriers and ultra-low cost carriers. Low-cost carriers include Southwest and JetBlue, while the ultra-low cost carriers are comprised of Spirit, Allegiant, and Frontier.[1] Unlike legacy carriers, both low-cost and ultra-low cost carriers favor the usage of direct flights. While this requires them to largely eschew smaller markets, it allows for the avoidance of expenditures

[1] Alaska Airlines and Hawaiian Airlines are larger carriers with a regional focus. They operate a model closer to legacy carriers than those of low-cost carriers. Furthermore, there exist several smaller, more regional-focused low-cost carriers, such as Sun Country that represent fringe supply within the industry. Later analyses within this paper treat products from these airlines as if they were offered by a single ”other” airline.

relating to operating hub airports and additional plane models. These cost savings allow for these firms to offer more competitive pricing than the legacy carriers.

Ultra-low cost carriers are distinguished from low-cost carriers through the practice of "unbundling," wherein base ticket prices are lower but amenities traditionally included are additional purchases. While Ryanair in Europe has operated under this model since the 1990s, a United States firm would not successfully adopt the strategy until Spirit introduced fees for checked baggage in 2010 (Bachwich and Wittman, 2017). While complaints regarding the quality of these airlines are well documented in consumer surveys and the press (Vasel, 2016; Elliott, 2022), these airlines have managed a degree of success by targeting highly budget-conscious travelers who do not wish to pay more expensive fares. By the later part of the 2010s, trips on ultra-low cost carriers represented over a tenth of total air travel within the United States. Despite this growth, the industry is still dominated by the "big four" carriers - the three legacy carriers who along with Southwest comprise approximately three-quarters of the overall passenger trips within the United States.

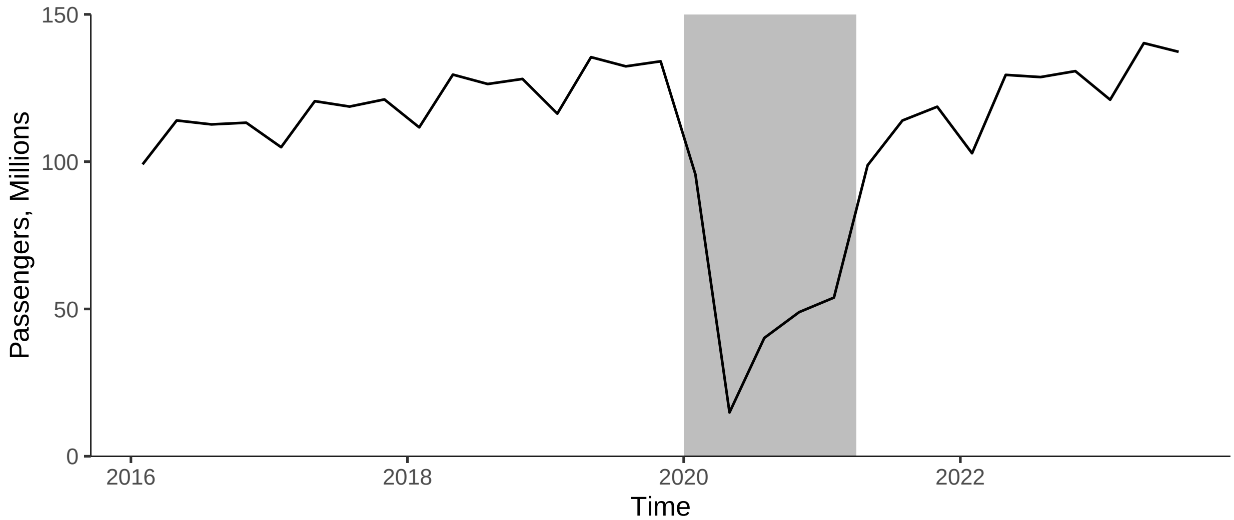
Spirit rapidly grew within the post-recession domestic aviation landscape through its adoption of the ultra-low cost carrier model. As documented in Figure D4, Spirit grew its fleet from under 50 planes before adopting the ultra-low cost model to nearly 200 planes by 2022. As part of this expansion in operations, Spirit increasingly competed against JetBlue (Figure D5). This trend is especially notable as very few markets have historically had multiple low-cost carriers operating within them (Kwoka et al., 2016; Ciliberto et al., 2021). However, in recent years, there are approximately a third as many markets with multiple low-cost carriers operating within them as there are markets with only a single low-cost carrier (Figure D1). Presently, both firms primarily operate in airports situated along the eastern seaboard of the United States in addition to Las Vegas and major cities in Texas and California.

Despite these similarities in operations, JetBlue would compete less vigorously than Spirit by the 2020s. JetBlue's most notable anti-competitive behavior was its creation of the "Northeast Alliance" (NEA) with American Airlines in 2020, which saw cooperation on flights originating from or departing to airports within the New York City and Boston areas: LaGuardia Airport (LGA), John F. Kennedy International Airport (JFK), Newark Liberty International Airport (EWR), and Boston Logan International Airport (BOS). I further elaborate on the NEA and its impacts on my estimation strategy in section 2.3.

Spirit, on the other hand, competed aggressively and operated as a maverick firm within the aviation industry. It has maintained a consistent pace of increasing its fleet size throughout the 2010s and into the 2020s (as graphed in Figure D4) despite the shock to air travel caused by the COVID-19 pandemic.[2] This growth in its fleet was required for expansion into new markets. As shown in Shrago (2024), Spirit causes

[2]As depicted in the aforementioned figure, JetBlue's fleet stagnated following the pandemic due to it negotiating delayed fulfillment of orders placed before the pandemic (Bellamy III, 2020; Sipinski, 2020).

Figure 1: Quarterly Passengers, All Carriers




Source: DB1B Data. Shaded region depicts the duration of the coronavirus pandemic before widespread vaccine availability within the United States, namely, from the first quarter of 2020 through the first quarter of 2021.

increased variance in fares within markets that it enters by inducing legacy carriers to compete for the highly cost-concerned travelers targeted by Spirit. They do this by offering ”basic economy” fares which operate similarly to Spirit’s “unbundled” fares.

Finally, it is important to note the impact of the coronavirus pandemic on the aviation industry. A severe drop in air travel occurred almost immediately as consumers and businesses canceled travel plans due to both virus concerns and government mandates. While widespread vaccine availability allowed for recovery to 2016 levels of air travel by the second quarter of 2021, passenger levels would not recover to 2019 levels of air travel until halfway into 2022 (see Figure 1).

However, this recovery in ridership did not mark a return to the prior market conditions for the industry. Historically, approximately a third of air travel is motivated by business (Berry and Jia, 2010; Bet, 2021a)). However, following the pandemic, business travel decreased as businesses switched to telecommunications for meetings rather than face-to-face interactions (Semuels, 2021). Meanwhile, leisure travelers built savings during the decline in travel, allowing them to behave less price-sensitively following the pandemic. As such, the overall change in price elasticity is apriori ambiguous.[3] As such, consumption patterns are liable to differ between the pre-pandemic and post-pandemic periods despite the large recovery in passenger levels.

[3]In a recent working paper, Ewen (2023), this phenomenon appears to have occurred, with a non-negligible share of leisure travelers being less price-sensitively than before the pandemic. In Table 5, I find evidence that the demand for airfare has become slightly less elastic following the pandemic, consistent with the idea that this change in consumer behavior was enough to offset the changes from business travel on elasticity.

Table 1: JetBlue-Spirit Merger Timeline

| Year | Date | Event |
|---|---|---|
| 2022 | February 7 | Frontier-Spirit Merger Announced |
| | April 5 | First JetBlue Offer for Spirit Released |
| | May 6 | Spirit Rejects JetBlue Offer |
| | July 27 | Frontier-Spirit Merger Attempt Collapses |
| | July 28 | Spirit Board Approves JetBlue Merger |
| | October 19 | Spirit Shareholders Approve Merger |
| 2023 | March 7 | Department of Justice Files Suit |
| | October 31 - December 5 | JetBlue-Spirit Merger Trial |
| 2024 | January 16 | JetBlue-Spirit Merger Blocked |
| | March 4 | JetBlue, Spirit Drop Appeal Plans |

## 2.2 Attempted JetBlue-Spirit Merger

Spirit announced its intention to merge with fellow ultra-low cost carrier Frontier in February 2022 (Schaper and Hernandez, 2022). This prompted a counteroffer from JetBlue in April for ownership of Spirit, leading the Spirit and Frontier merger to be called off in July (Josephs, 2022a,b). By mid-October, Spirit shareholders approved the acquisition by JetBlue (Koenig, 2022). The next year would see the United States Department of Justice, the District of Columbia, Massachusetts, and New York Attorneys General file suit to block the merger in March (Chokshi, 2023). Following a trial in the winter of 2023, the merger would be blocked on January 16, 2024 on the grounds that highly price conscious travelers "who must rely on Spirit" would face harm in the form of higher prices from the merger (William G. Young, 2024). These events are summarized in Table 1.

JetBlue publicly considered the acquisition of Spirit to be a top priority for the company, choosing to not appeal the ruling blocking its Northeast Alliance with American Airlines in favor of focusing its resources on overcoming the lawsuit seeking to block the merger with Spirit (Aratani, 2023). Beyond these legal resources, it directed resources toward trying to win public favor over the merger. Notably, it coordinated comment submissions to a Department of Transportation regulatory filing regarding the merger with pro-merger comments sourced from its employees.[4] Despite this, following the ruling against the merger it would ultimately choose to drop its appeals, with some financial analysts noting a significant deterioration of Spirit's financial stability between 2022 and 2024 (Sider, 2024).

[4]Some employees went on to dispute that these comments accurately reflected their views (Birnbaum, 2023; Birnbaum and Nylen, 2023). In Appendix C, I use stance detection techniques to analyze comments left on this filing in more detail.

Table 2: Northeast Alliance Timeline

| Year | Date | Event |
|---|---|---|
| 2020 | Quarter 1-2 | JetBlue and American Negotiate Alliance |
| | July 16 | Northeast Alliance Announced |
| | July 22 | Alliance Agreement submitted to DOT |
| 2021 | January 10 | DOT Terminates Antitrust Review |
| | February 24 | Codesharing Agreement Begins on X Routes |
| | May 26 | Reciprocal Loyalty Earnings Begins |
| | Early September | NEA Shuttle at JFK Opens |
| | September 21 | DOJ Files Lawsuit Against NEA |
| 2022 | September 27 - November 18 | NEA-Trial |
| 2023 | May 19 | NEA Ruled Anti-Competitive |
| | July 5 | JetBlue Drops Appeal Plans |
| | July 21 | NEA Codesharing Ends |
| | October 31 | JFK Shuttle Ceases Operation |
| | October 31 | 12 Slot Leases to JetBlue Terminate |
| 2024 | March 31 | 27 Slot Leases to JetBlue Terminate |
| | March 31 | 1 Slot Lease to American Terminates |
| | October 26 | Remaining NEA Slot Leases Terminate |

### 2.3 Northeast Alliance

Prior to its attempted merger with Spirit, JetBlue entered into the Northeast Alliance (NEA) with American Airlines at the start of 2021. The NEA saw the two firms coordinate operations to behave as a single carrier for routes that touched upon airports serving the New York City and Boston markets. They jointly decided their network for these routes, and operated them intending for consumers to be indifferent between the two carriers, worked to minimize overlap in product offerings on these routes, and shared revenue from products within the agreement. The United States Department of Justice along with six states and the District of Columbia brought a lawsuit against the agreement in September 2021 alleging violations of the Sherman Antitrust Act. Following a 2022 trial, the agreement would be found to violate the Sherman Antitrust Act in May 2023 and it was subsequently unwound (Rennison and Chokshi, 2023; Rains, 2023).[5] With this timeline outlined, I will now briefly discuss how the NEA differs from traditional aviation alliances and the issues it posses for estimation of the counterfactual merger effects for the JetBlue-Spirit merger.

Alliances between aviation firms are commonplace within consumer aviation. For example, Delta is part of the “SkyTeam Alliance” and United is part of the “Star Alliance.” These alliances see firms operating code-sharing agreements between different carriers, in which airlines can sell seats on flights operated by other airlines, with the ticket being under the code of the airline which sold the ticket.This allows, for example, for passengers of the Canadian airline Westjet to book connecting flights into the United States by using Delta

[5]Table 2 details a timeline of key events relating to the NEA. Notably, some landing slot leases between the two airlines related to the merger experienced a gradual reversion to their original owners.

flights for the legs of their trip situated solely in the United States. These agreements are primarily operated between carriers situated in different countries which allows for better access to foreign markets as airlines are not normally able to fly routes entirely situated within a single foreign country. Benefits to consumers include the earning of frequent flier miles across all stages of a journey, regardless of the operating carrier, easier handling of baggage, and easier bookings. Meanwhile, carriers benefit from being able to offer a wider variety of destinations than would otherwise be possible.

Domestic aviation alliances are rare at present. Unlike alliances between domestic and foreign carriers, these agreements are generally unable to receive waivers from antitrust proceedings through the Department of Justice and as such face additional regulatory scrutiny. Traditionally, these domestic agreements only apply to markets without both firms and the alliance's members otherwise maintain separate routing decisions, operations, and planning. One example of a currently active domestic aviation alliance is the West Coast Alliance between American and Alaska Airlines.

Contrasting this traditional approach, the NEA was structured to act more similarly to a merger on affected routes. The two firms jointly scheduled flights within the selected cities, minimized overlap on routes operated by both firms[6], and coordinated operations at the airports impacted by the agreement.[7] Furthermore, as two of the impacted airports featured slot and gate controls[8], the NEA saw these firms share slot permits and share gates at the affected airports. This would be found by the trial court to have increased barriers to entering the New York City air travel market by deterring these firms by selling off landing slots to other firms.

The NEA impacts the evaluation of the counterfactual effects of the JetBlue-Spirit merger through its effects on the product offerings of JetBlue. Through jointly optimizing its network structure with American Airlines, JetBlue operated flights in different markets than it otherwise would have. As my simulation of the JetBlue-Spirit merger treats product offerings as exogenous, my post-pandemic results should be understood as estimating the world where the merger took place while the NEA was still in effect.

Beyond the changes to market structures, the NEA results in products within my sample that are assigned to JetBlue despite being operated solely or jointly with American. The majority of the NEA's existence saw over thirty products a quarter that fits these characteristics within markets that Spirit competes in (Table D1. As such, the recovery of marginal costs for these products is liable to be incorrect.

[6] It is not clear how effective this was. As documented in Figure D3, the levels of shared routes at each of the four impacted airports was within historically normal ranges.

[7] One example of this coordination is a shuttle operated by the two airlines at JFK to allow customers to transfer between the terminals used by each airline without having to clear security on a connecting trip (Griff, 2021).

[8] A slot-controlled airport is one in which airlines are assigned specified time slots by the FAA for departures and arrivals to allow for better coordination of runway usage in congested airports. These slots are set in advance of individual operation days and can be transferred between airlines as if they were property of the airline which holds them.

# 3 Data and Summary Statistics

The primary dataset used in the creation of this paper is the Bureau of Transportation Statistics' Airline Origin and Destination Survey (DB1B). The DB1B is a 10% sample of all domestic airline itineraries within the United States that includes data on pricing, distance, carrier, and number of flights within an itinerary. Within the literature examining the aviation industry, it has been the preferred data for domestic air travel for decades (e.g. Ciliberto et al. (2021); Berry and Jia (2010); Goolsbee and Syverson (2008); Peters (2006)). The sample used for the analyses in this paper covers the years between 2017 and 2023.

Despite the breadth of its included information, the DB1B has one key limitation - recorded fares comprise solely the base airfare. As such, it under reports the true fares paid by customers for the "unbundled" products offered by Spirit and other ultra-low cost carriers.[9] This inhibits a proper simulation of changes to consumer surplus following the merger, as discussed in more detail in Section 4.3.

Markets are defined by origin airport, destination airport, year, and quarter. Within this definition, I treat originating and terminating airports as the determinants of markets rather than airports' metropolitan statistical areas which is common within the literature (e.g. Ciliberto and Williams (2014); Luo (2014); Tan (2016); Ciliberto et al. (2021)). It is known within the literature that consumers do not treat airports within a metropolitan statistical area as interchangeable.Goolsbee and Syverson (2008), for example, observes differential impacts on pricing of possible firm entry at the airport level than would be expected if airports within a metropolitan statistical area were treated as interchangeable by consumers. Within this paper, products within a market are further defined by both their ticketing carrier and non-stop status. As such, each carrier can have zero, one, or two products within a market. Appendix A details the sample construction methodology and restrictions on markets and itineraries included within the sample (such as excluding markets that consist of airports that are fewer than 150 miles apart to improve processing times).

Furthermore, I use the United States Census Bureau's annual estimates of metropolitan statistical area population to calculate the potential size of markets within the sample.

Summary statistics for product-level data are included in Table 3. Both product prices and ridership fell on average following the pandemic, with the average itinerary $22 cheaper in real terms while having 700 fewer passengers. Notably, despite the high levels of inflation within the post-pandemic period, nominal fares increase by only $6 between the two periods. Delta's representation within the samples decreased by 3 percentage points while Southwest, Spirit, and the 'Other' carrier[10] increased their product offerings by

[9]Legacy carriers have instituted a tier of fare known within the industry as "basic economy" to compete with Spirit through a limited amount of unbundled fares. As such, these fares are likewise lower than the true amount paid by consumers. The DB1B does not include reliable information on fare class, and as such, these fares are unable to be detected.

[10]The 'Other' carrier contains the products of minor carriers that operate within the industry, such as Sun Country. Alaska Airlines, Allegiant Air, and Frontier Airlines are not classified as this.

Table 3: Product Level Summary Statistics

| | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | |
| Price (2017 USD) | 234.01 | (68.85) | 33.12 | 236.38 | 810.58 |
| Price (Nominal USD) | 238.44 | (70.1) | 34 | 240.86 | 821.77 |
| Passengers | 4257.23 | (10192.88) | 100 | 810 | 192050 |
| Distance (1000s) | 1.42 | (0.69) | 0.15 | 1.28 | 4.8 |
| Extra Distance | 0.14 | (0.21) | 0 | 0.06 | 3.71 |
| Nonstop | 0.28 | (0.45) | 0 | 0 | 1 |
| Origin Destinations | 30 | (33.39) | 1 | 13 | 180 |
| Origin Presence (%) | 36.26 | (31.28) | 0.54 | 19.57 | 100 |
| Delta | 0.25 | (0.43) | 0 | 0 | 1 |
| American | 0.22 | (0.41) | 0 | 0 | 1 |
| United | 0.14 | (0.35) | 0 | 0 | 1 |
| Southwest | 0.25 | (0.43) | 0 | 0 | 1 |
| JetBlue | 0.03 | (0.17) | 0 | 0 | 1 |
| Spirit | 0.03 | (0.18) | 0 | 0 | 1 |
| Other Carrier | 0 | (0.06) | 0 | 0 | 1 |
| Observations | 307289 | | | | |
| **Post-Pandemic** | | | | | |
| Price (2017 USD) | 212.77 | (75.21) | 27.96 | 209.94 | 737.78 |
| Price (Nominal USD) | 245.31 | (89.02) | 30.25 | 240.19 | 852.7 |
| Passengers | 3531.43 | (8648.27) | 100 | 690 | 144930 |
| Distance (1000s) | 1.41 | (0.67) | 0.15 | 1.28 | 3.86 |
| Extra Distance | 0.14 | (0.19) | 0 | 0.07 | 1.83 |
| Nonstop | 0.26 | (0.44) | 0 | 0 | 1 |
| Origin Destinations | 29.24 | (33.72) | 1 | 12 | 187 |
| Origin Presence (%) | 34.77 | (30.92) | 0.53 | 18.42 | 100 |
| Delta | 0.22 | (0.41) | 0 | 0 | 1 |
| American | 0.22 | (0.41) | 0 | 0 | 1 |
| United | 0.13 | (0.34) | 0 | 0 | 1 |
| Southwest | 0.26 | (0.44) | 0 | 0 | 1 |
| JetBlue | 0.03 | (0.16) | 0 | 0 | 1 |
| Spirit | 0.04 | (0.2) | 0 | 0 | 1 |
| Other Carrier | 0.01 | (0.1) | 0 | 0 | 1 |
| Observations | 265196 | | | | |

A product is defined as a set of origin airport, destination airport, year, quarter, firm, and nonstop status. "Origin Destinations" is the number of airports served from the originating airport across all firms, "Origin Prescence" is the fraction of these destinations served by the ticketing carrier. The pre-pandemic sample includes all quarters of the years 2017 through 2019. The post-pandemic sample includes data from the second quarter of 2021 through the second quarter of 2023. The 'Other' carrier contains the products of minor carriers that operate within the industry, such as Sun Country. Alaska Airlines, Allegiant Air, and Frontier Airlines are not included within this category.

Table 4: Market Level Summary Statistics

| | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | |
| Minimum Miles (1000s) | 1.18 | (0.64) | 0.15 | 1.02 | 2.95 |
| Average Miles (1000s) | 1.23 | (0.66) | 0.15 | 1.07 | 4.39 |
| Number of Firms | 2.93 | (1.49) | 1 | 3 | 9 |
| Number of Products | 3.52 | (2.1) | 1 | 3 | 15 |
| Number of Customers | 14974.29 | (28289.99) | 260 | 4150 | 406050 |
| HHI | 8044.07 | (4347.52) | 1611.61 | 7058.6 | 56397.84 |
| Observations | 87363 | | JetBlue Markets | 7442 | |
| JetBlue & Spirit Markets | 1533 | | Spirit Markets | 7474 | |
| **Post-Pandemic** | | | | | |
| Minimum Miles (1000s) | 1.19 | (0.64) | 0.15 | 1.04 | 2.96 |
| Average Miles (1000s) | 1.24 | (0.66) | 0.15 | 1.1 | 2.98 |
| Number of Firms | 3.21 | (1.56) | 1 | 3 | 9 |
| Number of Products | 3.79 | (2.16) | 1 | 3 | 14 |
| Number of Customers | 13375.81 | (25085.61) | 230 | 3840 | 317370 |
| HHI | 7479.76 | (4410.86) | 1460.46 | 6260.03 | 20000 |
| Observations | 70016 | | JetBlue Markets | 5945 | |
| JetBlue & Spirit Markets | 1554 | | Spirit Markets | 9123 | |

A market is defined as a combination of origin airport, destination airport, year, and quarter. The average miles reported within a market is weighted by itinerary passengers. The pre-pandemic sample includes all quarters of the years 2017 through 2019. The post-pandemic sample includes data from the second quarter of 2021 through the second quarter of 2023. JetBlue (Spirit) markets is the total number of markets operated by JetBlue (Spirit) within the period of observation. "JetBlue & Spirit Markets" is the total number of markets with both firms competing within them.

approximately one percentage point each. As such, the mix of firms is broadly similar between the two periods. Finally, products are slightly less likely to include an intermediate stop following the pandemic and cover slightly smaller distances.

I present summary statistics for market-level characteristics in Table 4. Despite the post-pandemic period including fewer overall markets due to its shorter duration, the post-pandemic sample includes over a hundred additional markets contested by both JetBlue and Spirit than the pre-pandemic sample. The increased competition within the post-pandemic period is not limited to these markets, as evidenced by the roughly a third of an additional firm in the average market. This increase is driven by additional firms that offer only one product within a given market. Even with the lower real prices observed within the post-pandemic sample, the average market has approximately 16,000 fewer customers in the post-pandemic sample than in the pre-pandemic sample. The miles flown within markets is broadly consistent between the two periods. This is not surprising, as it would seem unlikely that the pandemic would lead to large scale rerouting of air networks.

# 4 Analysis

## 4.1 Demand

I estimate demand using the random coefficient nested logit model formalized in Grigolon and Verboven (2014), which extends the random coefficient logit model introduced by Berry et al. (1995) to include a nested component. Adopting the standardized model notation from Conlon and Gortmaker (2020), each consumer $i$ in market $t$ receives indirect utility from buying product $j$ parameterized by

$$U_{ijt} = \delta_{jt} + \mu_{ijt} + \epsilon_{ijt}$$

where $\delta_{jt}$ is the mean utility across consumers in market $t$ for product $j$, $\mu_{ijt}$ is each consumer's deviation from this mean utility, and $\epsilon_{ijt}$ comprises unobserved consumer level shocks. The consumer's mean utility of consuming product $j$ in market $t$, $\delta_{jt}$, is parameterized as

$$\delta_{jt} = \alpha p_{jt} + x_j \beta + F_{jt}\gamma + \xi_{jt}$$

where $p_{jt}$ is the price of product $j$ in market $t$; $x_{jt}$ is a vector of observed itinerary characteristics including nonstop flight status, miles flown, the square of the miles flown, the percent of destinations from the originating airport served by the airline, the extra miles traveled[11], the square of the extra miles traveled, and a dummy variable which is 1 if the route serves a market including an endpoint which is either Las Vegas or in the state of Florida; $F_{jt}$ is a vector of carrier and time fixed effects; and $\xi_{jt}$ is a product level shock shared by all consumers within a market.[12] The non-price are those product characteristics which should be largely unresponsive to demand shocks as they are determined by a carrier's network structure and the geography between the origin and destination airports. As such, these characteristics should not change in response to unobserved quarterly demand shocks.

The consumer specific deviation from the mean utility, $\mu_{ijt}$, is parameterized as

$$\mu_{ijt} = \sigma_p p_{jt} \nu_{ip} + \sigma_n n_{jt} \nu_{in} + \sigma_m m_{jt} \nu_{im}$$

with the $\nu$ parameters drawn from a standard normal distribution, $p$ the product's price, $n$ the product's nonstop status, and $m$ the miles flown for the product. Each parameter $\sigma$ is the standard deviation of the distribution of consumer preferences for this product trait.

[11]This is defined as being the difference between each product's miles traveled and the minimum miles traveled within the market.

[12]This includes product characteristics unobserved by the author, such as advertising.

Within this model specification, air travel is included within one nest and the outside good[13] is included in the other nest. This requires the parameterization of consumer level deviations from mean product utility as $\epsilon_{ijt} = \bar{\varepsilon}_{it} + (1-\rho)\bar{\epsilon}_{ijt}$. Here, $\bar{\epsilon}_{ijt}$ is assumed to follow a type 1 extreme value distribution while $\bar{\varepsilon}_{it}$, the random deviation from the mean shared by all air travel products for a given consumer, is assumed to be distributed such that the overall random error, $\epsilon_{ijt}$, still follows a type 1 extreme value distribution. The nesting parameter $\rho$ is required to be within the interval $[0,1]$ as it measures the correlation in preferences between airfare products. As such, higher $\rho$ indicate that air travel products are closer substitutes for each other while lower $\rho$ indicates that the products are less substitutable with each other. Finally, the utility from consuming the outside good is normalized to zero.

Consumer $i$ purchases itinerary $j$ if it has greater utility than all other products in the market. As such, market shares can be obtained by integrating over the consumers within the market. Mathematically, these shares are

$$s_{jt} = \int \frac{\exp[V_{ijt}/(1-\rho)}{\exp[V_{ih(j)t}/(1-\rho)]} \frac{\exp[V_{ih(j)t}]}{1+\sum_{h\in H \exp V_{iht}}} di$$

where

$$V_{iht} = (1-\rho)\log\left[\sum \exp[V_{ikt}/1-\rho]\right]$$

Within the industrial organization literature focused on airlines, practitioners generally estimate demand through the application of either the nested logit model (such as in Turner (2022); Ciliberto et al. (2021); Aguirregabiria and Ho (2012)) or the random coefficient logit model originally described in Berry et al. (1995).[14] Examples of the use of the nested logit model include Turner (2022); Ciliberto et al. (2021); Aguirregabiria and Ho (2012); examples of the use of the random coefficient logit model include Gayle (2013); Berry and Jia (2010). Through the use of random coefficients and a nested logit structure for the random errors, the random coefficient nested logit model better approximates own-price and cross-price elasticities than the other models, at the cost of increased computational requirements (Grigolon and Verboven, 2014). That the random coefficient nested logit model estimates each type of price elasticity more reliably than the other models is of particular importance to this work as price elasticities are the primary input used for the estimation of marginal costs and shares within the merger simulation detailed in Section 4.3.

Four sets of instruments are used to account for the endogeneity of prices and shares within a market. The first set consists of a dummy variable which is 1 if at least one of the endpoint airports is a hub of the ticketing carrier, the product of this variable with the miles traveled, and the product of this with the

[13]The outside good within a market is defined as the decision not to consume air travel between an origin and destination airport pair. As such, the outside good includes not making a trip, making a trip by car or bus, and making a trip between two different airports within the same origin and destination metropolitan areas.

[14]Bet (2021a) is an example of existing literature which uses the random coefficient nested logit model.

square of the miles traveled. These serve as cost shifters.[15] The second set of instruments, employed to account for the endogeneity of market shares, consists of the differentiation instruments described in Gandhi and Houde (2019) constructed from a dummy variable for nonstop flight status, the distance traveled, the square of the distance, and the service ratio of the ticketing carrier out of the originating airport. The third set of instruments, employed to instrument for the nesting parameter $\lambda$ consists solely of the number of products within a market to assist in model convergence. Finally, all remaining exogenous regressors and their interactions comprise the final set of instruments.[16]

Results for the estimation of this model's coefficients for both periods are included in Table 5. With the exception of nonstop flight status and the tourist route dummy variable, all variables are predicted to influence consumer demand in both periods. That the estimated coefficient on nonstop flight status is insignificant is not concerning as the model additionally includes variables that account for the responsiveness of consumers to extra miles traveled over the minimum in the market, which were strongly significant. Therefore, consumer preferences over nonstop flights are not different than would be expected.

Of the estimated random effects, only price takes a significant coefficient, of roughly 0.6. Finally, I estimate a nesting parameter of a little over a tenth in both periods. This is consistent with high degrees of substitutability between air travel and the outside good, which is inconsistent with most previous literature's estimates of the nesting parameter for similar models. As such, consumers are predicted to have a high willingness to enter (leave) the market in response to a price decrease (increase).

JetBlue's products face more elastic demand than Spirit's, consistent with the firm targeting less budget-conscious travelers than Spirit. Consumer preferences are estimated to have become less price elastic between the pre-pandemic and post-pandemic periods. This suggests that despite the decline in business travel following the pandemic, leisure travelers' spending patterns changed to be less price sensitive, perhaps due to excess savings acquired during the pandemic period or the desire to make up for lost vacations.[17] The estimated coefficient on tourist routes is consistent with this change in consumption patterns. It is strongly significant in the post-pandemic period but not the pre-pandemic period, consistent with the notion of increased tourism levels.

[15] In constructing the data, a round-trip itinerary is divided into two unidirectional itinerary each with imputed fare equal to half of the overall cost of the itinerary. As the majority of observations within my data are from round trip fares, I treat both origin hubs and destination hubs symmetrically in the construction of these instruments.

[16] Other instruments for price were considered, including interactions between the gas miles variable and characteristics of the origin airport and interactions between the exogenous variables. However, the selection of price shifters used in the final model had the best performance across the tests documented in Tables D5. The final specification chosen (column 4) has the benefit of passing the Wu-Hausman test while failing the Test of Over Identification by the least amount of the tested models. As noted in Nevo (2001), provided enough observations it is virtually impossible to pass this, and as such, I am not concerned with the result. For comparison purposes, the instrument comparison table on the post-pandemic period is included as Table D6.

[17] A working paper, Ewen (2023), which uses structural modeling on data from 2019 and 2022 observes similar patterns.

Table 5: Demand Estimation Results

| Variable | Pre-Pandemic | Post-Pandemic |
|---|---|---|
| **Linear Coefficients** | | |
| Price | -3.05*** | -3.11*** |
| | (0.38) | (0.44) |
| Nonstop | 0.838 | 1.16 |
| | (1.3) | (0.8) |
| Miles Flown | 1.34*** | 2.29*** |
| | (0.12) | (0.24) |
| Miles Flown$^2$ | -0.141*** | -0.343 |
| | (0.039) | (0.17) |
| Origin Prescence | 0.0117*** | 0.00812*** |
| | (0.00045) | (4e-04) |
| Extra Miles | -2.65*** | -2.34*** |
| | (0.11) | (0.13) |
| Extra Miles$^2$ | 1.62*** | 0.527*** |
| | (0.069) | (0.11) |
| Tourist Route | 0.0221 | 0.149*** |
| | (0.028) | (0.03) |
| **Nonlinear Coefficients** | | |
| Price | 0.591*** | 0.599*** |
| | (0.14) | (0.12) |
| Nonstop | 0.249 | 0.0814 |
| | (5.4) | (10) |
| Miles Flown | 0.0152 | 0.066 |
| | (2.5) | (3.1) |
| **Nesting Coefficient** | | |
| Nesting Parameter | 0.132*** | 0.115*** |
| | (0.047) | (0.032) |
| **Summary Statistics** | | |
| Period | 2017Q1-2019Q4 | 2021Q2-2023Q2 |
| N Products | 307289 | 265196 |
| N Markets | 87363 | 70016 |
| Mean Elasticity | -5.591 | -5.211 |
| Spirit Mean Elasticity | -4.28 | -3.44 |
| JetBlue Mean Elasticity | -5.39 | -5.18 |
| Mean Markup (%) | 19.14 | 20.97 |

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$ Products are defined as a Carrier-Nonstop pair within an Origin-Destination-Year-Quarter market. Origin Service Ratio is the fraction of direct routes out of the originating airport operated by the carrier divided by the total number of direct routes originating from that airport. Extra Miles is the average additional miles flown with a connecting itinerary minus the minimum miles flown within a market. A tourist product has at least one endpoint in either the Las Vegas or Florida.

## 4.2 Supply

I assume that each aviation market operates under Bertrand competition with differentiated products following the exogenous determination of quarterly product offerings. As derived in Berry et al. (1995), profit maximizing firms will thus choose prices such that

$$P = MC + \Delta^{-1}s$$

where $MC$ is marginal cost and $\Delta = -\mathcal{H} \cdot \frac{\partial s}{\partial p}'$.[18] Here, $s$ is firm shares and $\mathcal{H}$ is an ownership matrix; within $\mathcal{H}$, $\mathcal{H}_{i,j} = 1$ if the same firm produces both products $i$ and $j$ and is zero otherwise.

Through the optimal pricing condition and the estimated own-price and cross-price elasticities, I am able to estimate both marginal costs and markups. As noted in Table 5, despite the observed decrease in the real price of airfare between the pre-pandemic and post-pandemic periods (Table 3), I estimate a slight increase in markups of approximately two percentage points between the pre- and post-pandemic periods.

It is common within the literature to model supply within air travel markets as Bertrand competition with differentiated products (Ciliberto et al., 2021; Li et al., 2022). However, it is worth noting that this assumption imposes a conduct restriction on the modeled firms, namely that they do not engage in coordinated pricing strategies between firms. Particularly, this results in the overestimation of marginal costs for firms collusive firms. While for Spirit this is unlikely to be an issue due to the airline's competitive practices, more caution is warranted in regards to JetBlue's markups due to the NEA. It is plausible that JetBlue became less willing to compete against American Airlines in both NEA and non-NEA markets to protect the agreement between the two firms. Unfortunately, virtually every JetBlue-Spirit market within my sample includes American Airlines. As such, my simulations might be predisposed to be hostile to the merger's impacts on prices. However, as my simulations using data from the pre-pandemic period have results largely similar to those from the post-pandemic period, I do not believe this to be driving my results.

## 4.3 Merger Simulation

With the demand and supply models used within this paper described, I can now simulate the JetBlue-Spirit merger. For each period, I estimate three counterfactuals. These are a best case scenario (where the merged product takes the lowest marginal cost and best unobservables of the two products), an average case scenario (where the merged product takes the average of the two firms marginal costs and the average of the estimated unobservables), and a worst case scenario (where the merged product takes the greater of the marginal costs

[18] To ease readability, I adopt the notation of Conlon and Gortmaker (2020).

of the two firms and the lowest estimated unobservable characteristics).[19] In each simulation, I assume that the combined firm's connecting products take on the minimum of the miles flown of the connecting products. As such, the merged firm will always exploit better routing enabled by the merger.[20] As a robustness check to allow for the realization of efficiencies post-merger, I estimate additional simulations where the merged firm's marginal costs decrease by either 5% or 10% in Appendix E.1 . The results for these alternative specifications are consistent with the results discussed within this section.

Table 6 contains the estimated price effects from the merger on individual product prices for markets that both firms competed in. In the best case scenario, I estimate declines in the average prices of products in markets wherein both JetBlue and Spirit competed of between 13% and 15%, or approximately $23 and $29, regardless of sample period. In the worst case scenario, I estimate a minimal increase in average market fares for the pre-pandemic period and an increase of approximately 5% in the post-pandemic period.

JetBlue was clear on its intention to retire the Spirit business model following the acquisition and retool all Spirit aircraft to follow the JetBlue configuration. As such, it is worthwhile to examine changes in estimated pricing and costs on market fares in markets in which Spirit competed but not JetBlue. In reality, prices would change in these markets due to the retirement of the Spirit brand and adjustment to the higher cost JetBlue model. However, as I do not have estimates of marginal costs for the JetBlue operational model for these markets, I will instead solely focus on the changes due to the change from Spirit to JetBlue brand which would underestimate the true price changes. The results of this simulation are described in Table 7.[21] Within these markets, I estimate that the average market would experience an increase in average fare of approximately 3.4% in the pre-pandemic period and 9.7% in the post-pandemic period. This finding reflects the negative consumer valuation of Spirit products over JetBlue products within the estimated demand models.

Now, I turn my attention to consumer welfare. Unfortunately, calculating consumer surplus is impossible with the available data from the DB1B. As alluded to in Section 3, Spirit offers "unbundled" fares which have additional fees required for the various amenities included in the base price of tickets for other firms (such as carry-on baggage). Consumers who would pay these fees at Spirit would have their change in consumer welfare overestimated traditional consumer surplus estimation techniques. Furthermore, as these fees differ between both customers and markets due to the use of algorithmic pricing (Senate Permanent Committee

[19]The choice of these as the simulation specifications has its roots in Ciliberto et al. (2021) which observes that the use of these specifications allows for analysis of the robustness of the results to different assumptions on how the merged firms products are realized. Beyond Ciliberto et al. (2021), the use of multiple merger specifications, generally including a 'best case' merger specification for consumer welfare is common within this literature (e.g. Li et al. (2022)).

[20]Furthermore, all products of the combined firm are coded as being operated by JetBlue for the purposes of carrier fixed effects. Both periods estimate fixed effects for Spirit products that are significantly more negative than for JetBlue products.

[21]As the different simulations are defined by the method used to combine products between the two firms, all simulations are equivalent for markets with only Spirit within them.

Table 6: Simulated Price Effects of Merger - Joint Markets

| | N | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 12074 | 2.04 | (0.69) | 0.47 | 1.98 | 4.91 |
| Best Case | 10106 | 2.08 | (0.66) | 0.46 | 2.02 | 5.08 |
| Average Case | 10106 | 2.12 | (0.64) | 0.46 | 2.06 | 5.14 |
| Worst Case | 10106 | 2.16 | (0.64) | 0.48 | 2.09 | 5.13 |
| **Market Average Price (100s, 2017 USD)** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.73 | (0.6) | 0.81 | 1.55 | 3.44 |
| Average Case | 1418 | 2 | (0.51) | 1.01 | 1.92 | 3.38 |
| Worst Case | 1418 | 2.01 | (0.5) | 1 | 1.92 | 3.5 |
| **% Change Average Price** | | | | | | |
| Best Case | 1418 | -15.13 | (16.83) | -53.06 | -16.77 | 31.42 |
| Average Case | 1418 | -0.7 | (10.36) | -38.87 | -0.19 | 39.57 |
| Worst Case | 1418 | 0.18 | (10.27) | -34.26 | 0.61 | 37.41 |
| **Median Price (100s, 2017 USD)** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.73 | (0.6) | 0.81 | 1.55 | 3.44 |
| Average Case | 1418 | 2 | (0.51) | 1.01 | 1.92 | 3.38 |
| Worst Case | 1418 | 2.01 | (0.5) | 1 | 1.92 | 3.5 |
| **Post-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 13650 | 1.96 | (0.78) | 0.35 | 1.89 | 5.25 |
| Best Case | 11496 | 2.01 | (0.77) | 0.4 | 1.94 | 5.34 |
| Average Case | 11496 | 2.05 | (0.74) | 0.4 | 1.99 | 5.33 |
| Worst Case | 11496 | 2.1 | (0.74) | 0.41 | 2.04 | 5.33 |
| **Market Average Price (100s, 2017 USD)** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.71 | (0.68) | 0.61 | 1.68 | 3.67 |
| Average Case | 1554 | 2.04 | (0.64) | 0.76 | 1.95 | 3.85 |
| Worst Case | 1554 | 2.06 | (0.64) | 0.76 | 1.96 | 3.93 |
| **% Change Average Price** | | | | | | |
| Best Case | 1554 | -13.67 | (18.18) | -59.32 | -10.99 | 39.39 |
| Average Case | 1554 | 4.21 | (9.96) | -32.12 | 4.07 | 49.1 |
| Worst Case | 1554 | 5.38 | (10) | -33.29 | 5.03 | 50.4 |
| **Median Price (100s, 2017 USD)** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.71 | (0.68) | 0.61 | 1.68 | 3.67 |
| Average Case | 1554 | 2.04 | (0.64) | 0.76 | 1.95 | 3.85 |
| Worst Case | 1554 | 2.06 | (0.64) | 0.76 | 1.96 | 3.93 |

Products from markets without both JetBlue and Spirit present are excluded. Distribution of changes of average market fares are graphed in Figures D6 and D7 for the pre-pandemic and post-pandemic periods respectively.

Table 7: Simulated Price Effects of Merger - Spirit Markets

| | N | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | | |
| **Prices (100s, 2017 USD)** | | | | | | |
| Observed | 37776 | 2.1 | (0.78) | 0.38 | 2.08 | 7.17 |
| Simulated | 30012 | 2.23 | (0.7) | 0.38 | 2.23 | 7.27 |
| **Market Average Price** | | | | | | |
| Observed | 5735 | 2.08 | (0.46) | 0.7 | 2.08 | 4.61 |
| Simulated | 5735 | 2.14 | (0.55) | 0.59 | 2.13 | 4.75 |
| **% Change Average Price** | | | | | | |
| Simulated | 5735 | 3.41 | (15.12) | -56.96 | 3.01 | 88.36 |
| **Post-Pandemic** | | | | | | |
| **Prices (100s, 2017 USD)** | | | | | | |
| Observed | 49630 | 1.97 | (0.82) | 0.29 | 1.95 | 6.27 |
| Simulated | 40330 | 2.17 | (0.77) | 0.32 | 2.17 | 6.88 |
| **Market Average Price** | | | | | | |
| Observed | 7569 | 1.97 | (0.53) | 0.6 | 1.94 | 4.07 |
| Simulated | 7569 | 2.16 | (0.62) | 0.72 | 2.13 | 5.52 |
| **% Change Average Price** | | | | | | |
| Simulated | 7569 | 9.71 | (12.21) | -44.52 | 9.65 | 75.68 |

Products are solely those from markets in which Spirit operated but not JetBlue.

on Investigations, 2024) it is unfortunately infeasible to do back-of-the-envelope estimations to try to recover the true, fee-inclusive, Spirit fares.

This motivates the consideration of another measure of consumer welfare, namely, the minimum fare available within each market. As noted by Judge Young in the merger trial, a large component of Spirit's customer base was highly price sensitive travelers who may not have been able to fly without the smaller base fares provided by Spirit. As such, it stands to reason that minimum fares within markets, in addition to the average fares, are important for understanding the counterfactual effects of the merger.

The overall change in minimum market fares, in twenty dollar intervals, is detailed in Table 8. Across the simulations of price changes within markets that both firms competed in, at least 35 (of the 1418 (1554) markets that both firms competed in within the pre-pandemic (post-pandemic) period), markets in each period are estimated to have the minimum price within the market increase by over \$60. Within both periods, these markets are primarily between airports in the New York and Boston areas and various destinations within the Southern portion of the United States (such as Houston and Dallas). As such, it is consistent with the finding of the key markets of concern within the trial.

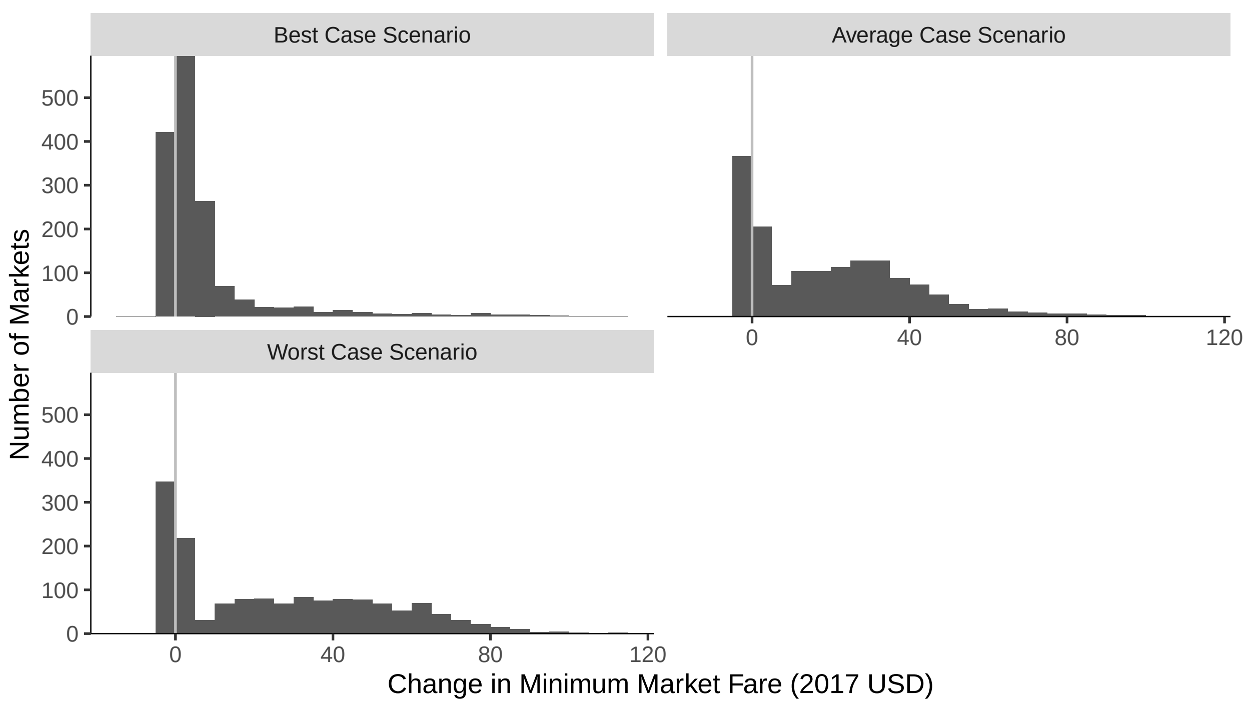
Figures 2 and 3 graph the distribution of estimated minimum market fares for the pre-pandemic and post-pandemic periods. In the pre-pandemic (post-pandemic) period there exists roughly 300 (200) markets estimated to have decreases of under \$5 in the minimum market fare in all specifications. At the same

Table 8: Change in Minimum Fare Available in Market (2017 USD)

| | Pre-Pandemic | | | Post-Pandemic | | |
|---|---|---|---|---|---|---|
| | Best | Average | Worst | Best | Average | Worst |
| $< 0$ | 421 | 364 | 341 | 375 | 309 | 231 |
| 0-20 | 967 | 485 | 401 | 1052 | 537 | 529 |
| 20-40 | 77 | 455 | 302 | 55 | 392 | 259 |
| 40-60 | 31 | 166 | 287 | 36 | 213 | 253 |
| 60-80 | 21 | 46 | 164 | 25 | 77 | 181 |
| $80 <$ | 16 | 17 | 38 | 11 | 26 | 101 |

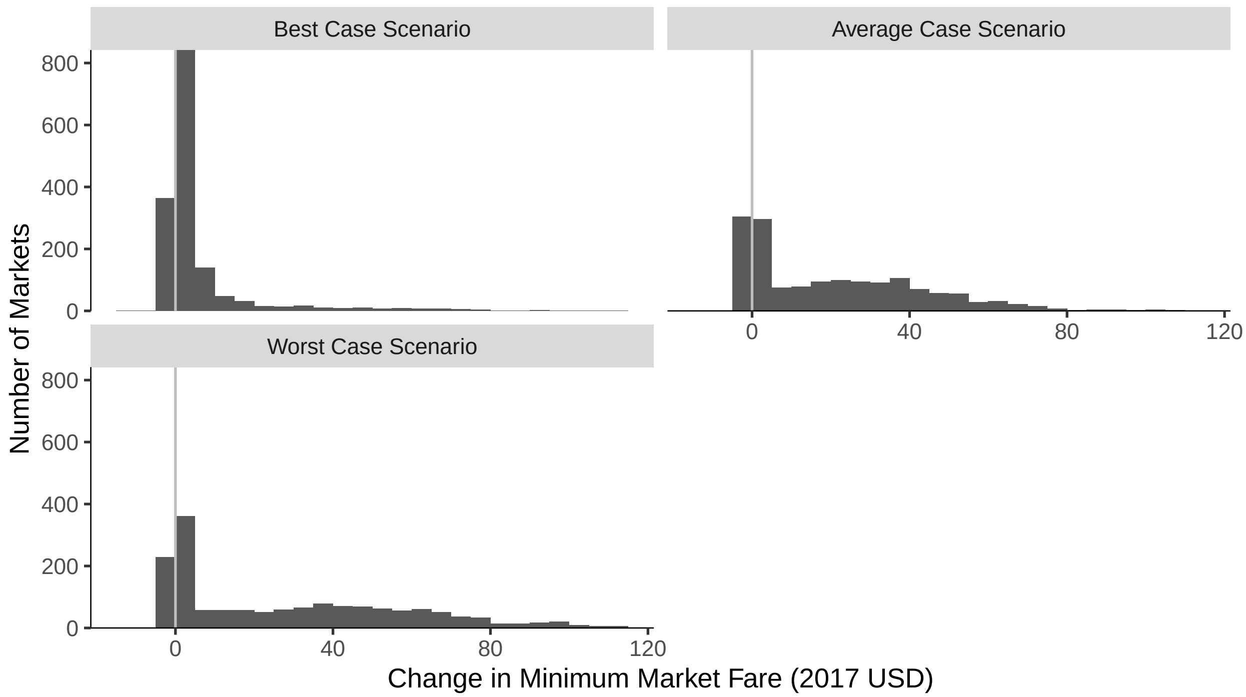
Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Prices are in 2017 dollars. A version of this table which reports the change in minimum fares in percent terms is included as Table D7.

Figure 2: Simulated Change in Pre-Pandemic Minimum Market Fares




The mean change in markets' minimum fares is 7.25 (19.36) [26.15] in the best (average) [worst] case merger simulations respectively.

Figure 3: Simulated Change in Post-Pandemic Minimum Market Fares




The mean change in markets' minimum fares is 6.51 (21.45) [29.21] in the best (average) [worst] case merger simulations respectively.

time, Importantly, these figures reveal the highly heterogeneous nature of the estimated changes under each simulation scenario, with the average case and best case scenarios having consistently highly dispersed predictions as to the change in the minimum market fares.

## 5 Conclusion

The proposed JetBlue-Spirit merger would have seen the end of the largest ultra-low cost carrier in the United States had it not been blocked following suit by the Department of Justice in 2024. Through the use of a structural demand model, I estimate that this merger would have increased the average fare within the average market by roughly 4% had it been completed in the post-pandemic period and negligibly impacted average market fares had it been completed during the pre-pandemic period.

However, this result obscures a key insight into Spirit's role within the aviation industry, namely, that its presence within a market primarily impacts fares at the low end of the fare distribution due to its targeting cost-conscious consumers of air travel through unbundled fares. As such, it is critical to consider the change in the minimum market fares had the merger been completed.

Under even the assumptions most favorable to the pro-competitive effects of the merger, I estimate that over 35 markets in the pre-pandemic and post-pandemic periods would have seen fares increase by over $60 had the merger been in effect. This finding aligns with the findings of the judge who considered the merger, who believed that the core consumer harm would have been for highly cost-conscious consumers at risk of being priced out of the market.

Beyond the immediate findings of this paper regarding the anti-competitive effects of the JetBlue-Spirit merger, its results caution regulators to carefully examine the entire price distribution of products following merger completion. Even in cases where merging firms have minimal impact on the average prices within a market, their presence may still significantly lower prices at the bottom end of the distribution of prices, allowing consumers to enter the market who would otherwise be unable to.

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# Appendices

## A Data Processing Methodology

As detailed in Section 3, I used the the Bureau of Transportation Statistics' Airline Origin and Destination Survey (DB1B) database as the primary data source for this paper. After compiling the DB1B into a single dataset for the years 2017 through the second quarter of 2023, I excluded observations from my sample using common criteria from the literature. Itineraries with fares lower than $15 were excluded to remove air travel purchased through frequent flier rewards points (4.88% of itineraries were excluded this way). Similarly, in line with prior work such as Berry and Jia (2010), itineraries with reported fares of over $2,000 dollars were excluded to avoid erroneously recorded fares (0.08% of itineraries were excluded this way). Beyond fares, itineraries were excluded from the sample if they had three or more layovers[22] or if they had a leg outside of the continental United States.[23]

I additionally excluded products and markets on the basis of several criteria. All markets within the year 2020 and the first quarter of 2021 were dropped to avoid capturing the decline in travel caused by the pandemic which is depicted in Figure 1. Furthermore, markets were excluded if they had fewer than 500 passengers fly within them, or had origin and destination airports within 150 miles. This restriction is in line with the past-literature (such as Ciliberto and Williams (2014)) and serves to not only improve computational speed but also account for these markets featuring stronger substitutability to the outside good for travel. To improve computational speed, I drop all markets with origin or destination outside of the 100 largest metropolitan statistical areas in the United States by population. This decision is notably unlikely to significantly impact the results of this paper as both JetBlue and Spirit focus their operations on larger metropolitan statistical areas. Finally, I exclude products with fewer than 100 passengers were excluded from the sample to avoid capturing irregular product offerings (2.50% of itineraries were excluded this way).

In calculating product shares, I estimate the total number of passengers of each product as being ten times the number of passengers recorded as purchasing it within the DB1B. I do this as the DB1B is a 10% sample of airline itineraries. Then, I divide each ridership estimate by the geometric mean of the origin and destination metropolitan areas, in line with the past literature.

As part of the handling of price data, I modify prices in two ways. For Spirit itineraries completed before 2020, fares had an additional $22.99 times the number of trip legs added to them to accounts for Spirit's

[22]A total of 0.03% of itineraries were excluded this way.

[23]As noted in Ciliberto et al. (2021), these flights receive subsidies from the United States Postal Service. As such, proper marginal cost recovery is infeasible while including them in the sample.

additional usage fee placed on itineraries which were not booked in-person at the airport. As noted in Shrago (2024), the majority of Spirit's customers paid these fees and these fees were included in the base ticket price in DB1B releases following 2020. Furthermore, I re-express prices in terms of 2017 United States dollars to allow for easier comparisons between the two sample periods due to the high levels of inflation within the post-pandemic period.

# B Merger Pre-Approval Effects

Historically, airline mergers have had effects on airfares before the completion of the merger. Within this section, I estimate the effects of the announcement of the merger on fares in markets served by both JetBlue and Spirit through a modified version of the model in Goolsbee and Syverson (2008) and Fan (2020). For carrier $c$ serving unidirectional route $r$ during quarter $q$, its average fare $y_{crq}$ is described by

$$\log(y_{crq}) = \sum_{i=-4}^{4} \beta_{M,i} I[q=i] Merge_c + \sum_{i=-8}^{4} \beta_{O,i} I[q=i] Other_c + \mu_c r + \gamma X_{crq} + \epsilon_{crq}$$

where $I[q=i]$ is 1 if $q=i$ and zero otherwise, $Merge_c$ is a dummy variable which is one if carrier $c$ is either JetBlue or Spirit, $Other_c$ is one if the carrier neither of the merging firms, $\mu_{cr}$ is carrier-route fixed effects, $X_{crq}$ is a vector of controls, and $\epsilon_{crq}$ is a random error term. As the Spirit-JetBlue merger was approved by Spirit's board in the third quarter of 2022, period 0 is defined as the second quarter of 2022. Furthermore, quarters from the height of the coronavirus pandemic (2020 and the first quarter of 2021) are excluded.

# C Merger Comments Analysis

As part of the merger process, JetBlue and Spirit were required to file an application with the Department of Transportation for the transference of operating certificates from Spirit to the combined firm, effective after the completion of the merger. Members of the public were allowed to leave public comments on the regulatory filing. Within this section, I employ stance detection techniques to analyze these comments at scale. While these comments are largely irrelevant to the ultimate blocking of the merger (namely, that it would be rejected following a suit brought by the Department of Justice), Spirit and JetBlue used these comments as part of their attempt gain public approval for the merger.

Stance detection is the task of detecting the position held by the author of a text regarding some topic. In this context, it is to determine if the author of a comment left on the regulatory filing supported or opposed

Table C1: Sentiment and Stance - Unique Comments

| Stance | Sentiment | | |
|---|---|---|---|
| | Positive | Neutral | Negative |
| Approves | 40 | 37 | 4 |
| Disapproves | 5 | 387 | 227 |

Each cell includes the number of comments with the given stance and sentiment. Only unique comments are included within this table.

the proposed JetBlue-Spirit merger. This context is particularly suitable for the use of modern machine learning models as these comments are focused (the econometrician knows the topic of the comments) and limited in length (larger bodies of text are unsuitable for the methodology used within this section). As such, I believe that an unsupervised pre-trained model should be effective at trying to gauge the stance of these comments.

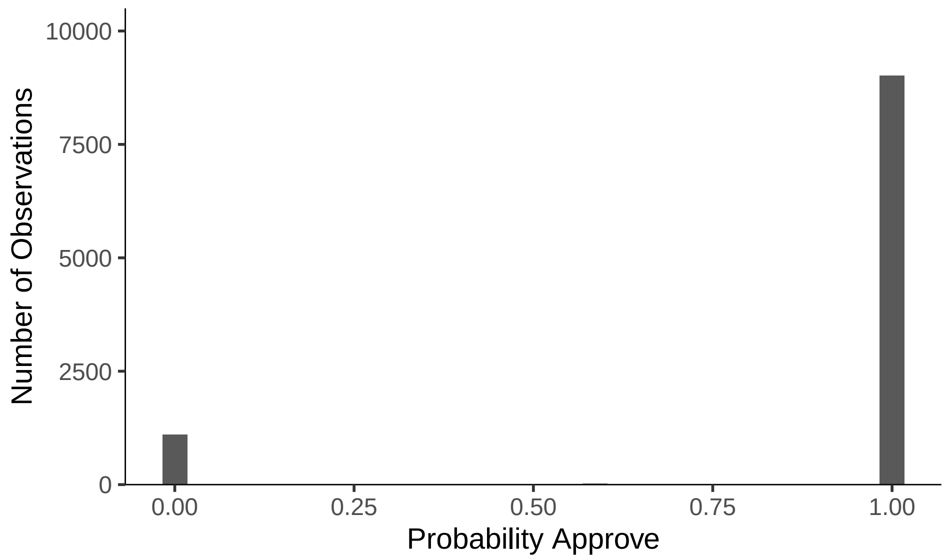
The stance detection problem should not be confused with that of the sentiment analysis problem. Sentiment analysis intends to capture the emotions expressed in a text rather than identify the emotions expressed within the text. As an example of how these differ, consider the comment "Competition is good for a healthy economy."[24] Using a pre-trained sentiment detection model developed for analyzing financial sentiment data, FinBERT, [25] this statement is correctly judged to possess positive sentiment (it uses positive language to describe competition). However, the stance detection model I use correctly judges this comment to oppose the merge. Table C1 details the breakdown of unique comments' assigned sentiments and stances.

This paper uses the pre-trained model documented in Laurer et al. (2024) to detect the stances of each comment left on the docket. Each comment is assessed for the probability that each comment agrees with the statements "The author of this comment {approves of, disagrees with} the merger." As these statements are mutually exclusive, the probabilities assigned for each comment sum to 1. As documented in Figures C1 and C2, most comments are strongly polarized, suggesting that the language model had little difficulty in assigning stances to comments. Looking over a sample of fifty unique comments, all are sorted as would be expected based on my understanding of the text. As such, I believe that this model is well suited for analyzing the public comments.

Table C2 contains summary statistics for these comments. Most comments approve of the merger. However, this is driven by duplicate comments. [26] The vast majority of unique comments, on the other hand, disapproved of the merger. On average, comments which approve of the merger are longer than those that disapprove. This table provides a helpful demonstration of the difference between the stance

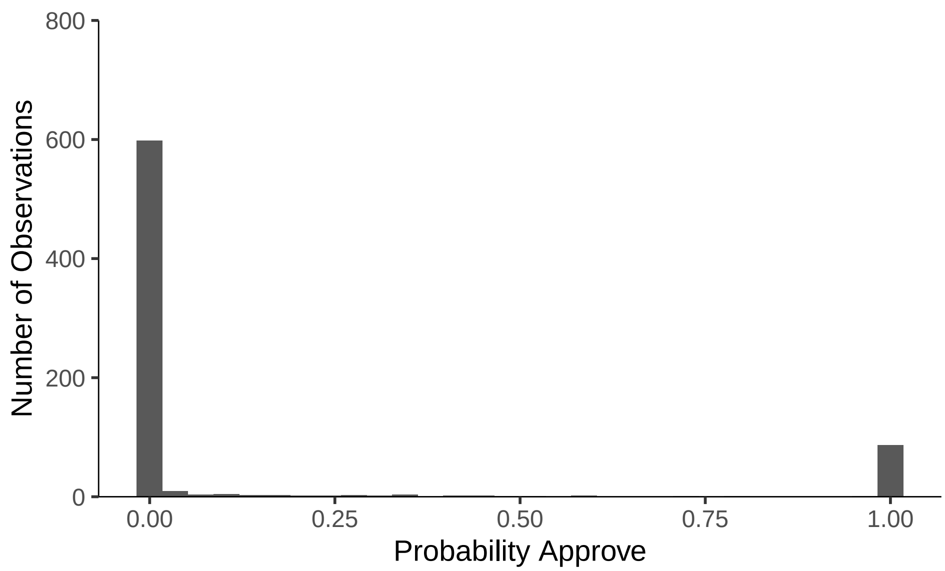
[24]This is an actual comment left on the regulatory docket.
[25]Model documentation is contained in Araci (2019).
[26]The exact legitimacy of these duplicate comments was a matter of some public debate, with some lawmakers alleging that they represented an "astroturf campaign" by the two merging firms falsely attributing them to employees (Birnbaum, 2023).

Figure C1: Probability Comments Approve




Data is sourced from the Department of Transportation regulatory filing regarding the JetBlue-Spirit merger (DOT-OST-2023-0024). "Probability Approve" is the probability that a comment approves of the merger.

Figure C2: Probability Comment Approves - Unique Comments Only




Data is sourced from the Department of Transportation regulatory filing regarding the JetBlue-Spirit merger (DOT-OST-2023-0024). "Probability Approve" is the probability that a comment approves of the merger.

detection and sentiment detection problems - the majority of disapproving comments expressed their views with neutral sentiment. Finally, the table documents the state of origin for the comments.

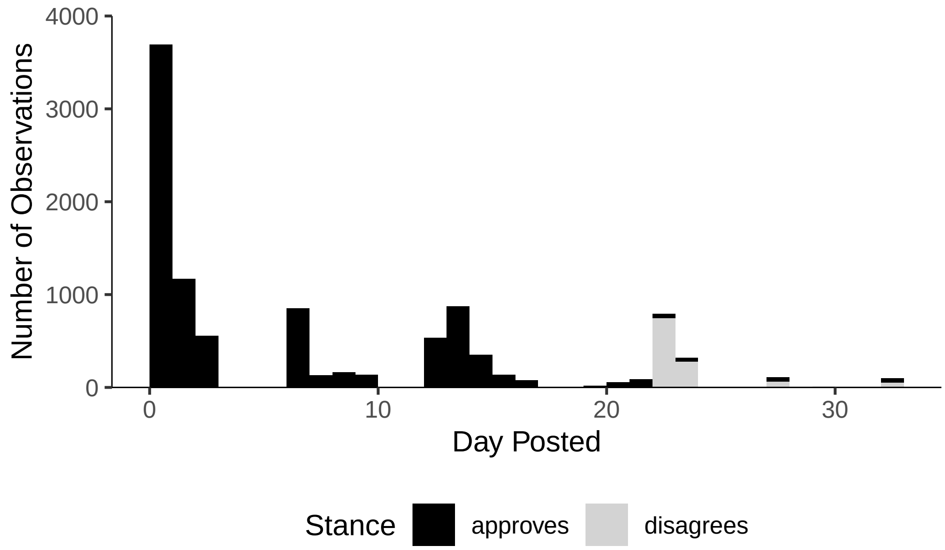
Table C2: Stance Detection Summary Statistics

| | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|
| **All Comments** | | | | | |
| P(Approves) | 0.89 | (0.31) | 0 | 1 | 1 |
| Approving Comment P(Approves) | 1 | (0.02) | 0.51 | 1 | 1 |
| Disapproving Comment P(Approves) | 0.01 | (0.04) | 0 | 0 | 0.49 |
| New York Comment | 0.14 | (0.35) | 0 | 0 | 1 |
| Florida Comment | 0.35 | (0.48) | 0 | 0 | 1 |
| Massachusetts Comment | 0.05 | (0.22) | 0 | 0 | 1 |
| Puerto Rico Comment | 0.01 | (0.12) | 0 | 0 | 1 |
| Observations | 10185 | | | | |
| **Unique Comments** | | | | | |
| P(Approves) | 0.13 | (0.32) | 0 | 0 | 1 |
| Approving Comment P(Approves) | 0.98 | (0.08) | 0.51 | 1 | 1 |
| Disapproving Comment P(Approves) | 0.01 | (0.06) | 0 | 0 | 0.49 |
| New York Comment | 0.06 | (0.24) | 0 | 0 | 1 |
| Florida Comment | 0.07 | (0.26) | 0 | 0 | 1 |
| Massachusetts Comment | 0.03 | (0.18) | 0 | 0 | 1 |
| Puerto Rico Comment | 0 | (0) | 0 | 0 | 0 |
| Observations | 701 | | | | |

Data is sourced from the Department of Transportation regulatory filing regarding the JetBlue-Spirit merger (DOT-OST-2023-0024). Comments have the stance with the highest probability assigned to them. This is the "Stance Probability." Similarly, "Sentiment Assigned Probability" is the sentiment with the highest probability assigned to a comment by the language model. Comment length is in characters.

Figure C3 plots the distribution of submitted comments on each day after the regulation was available for commenting upon. In the first twenty days, virtually every comment left on the docket supported the merger. Virtually every comment left on the docket after this period was opposed the merger. This may reflect asymmetry in the the resources available to JetBlue, Spirit, and anti-merger consumer welfare organizations.

Figure C3: Timeline of Submitted Comments

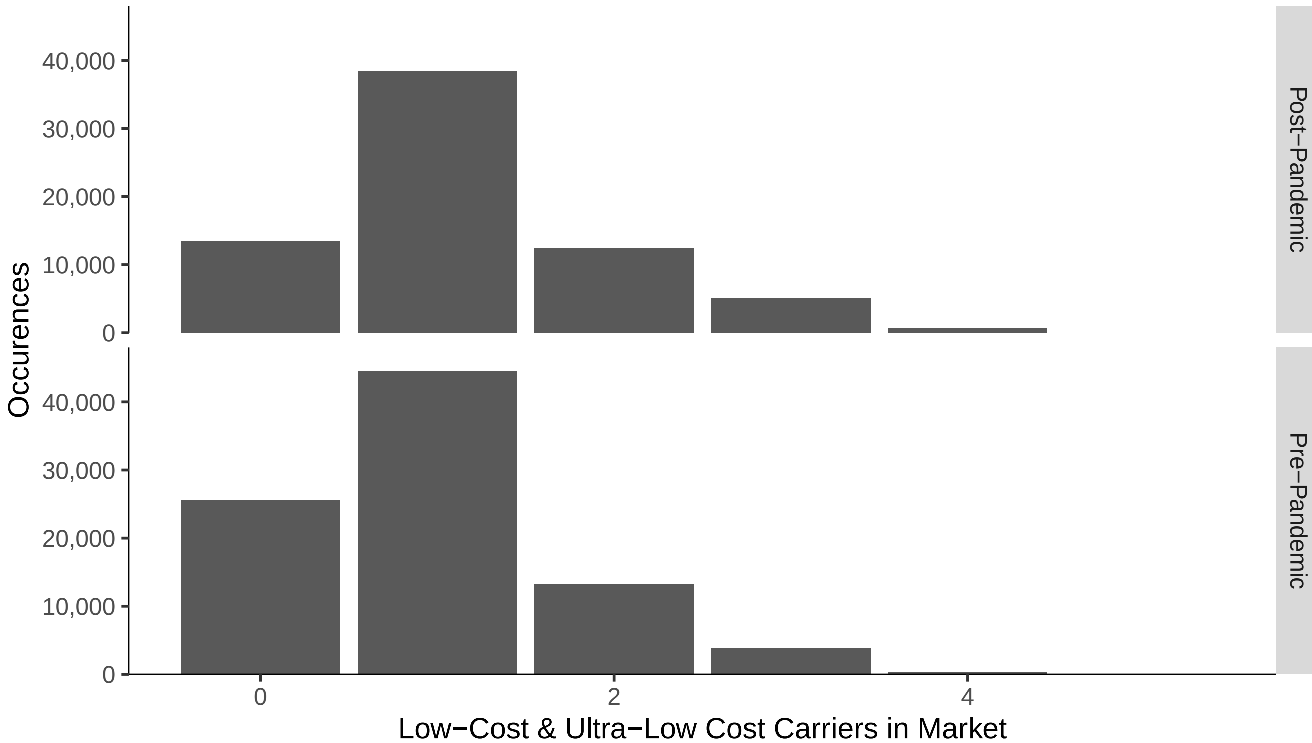



Data is sourced from the Department of Transportation regulatory filing regarding the JetBlue-Spirit merger (DOT-OST-2023-0024). Comments have the stance with the highest probability assigned to them.

# D Additional Figures and Tables

## D.1 Additional Descriptive Figures and Tables: Aviation Industry

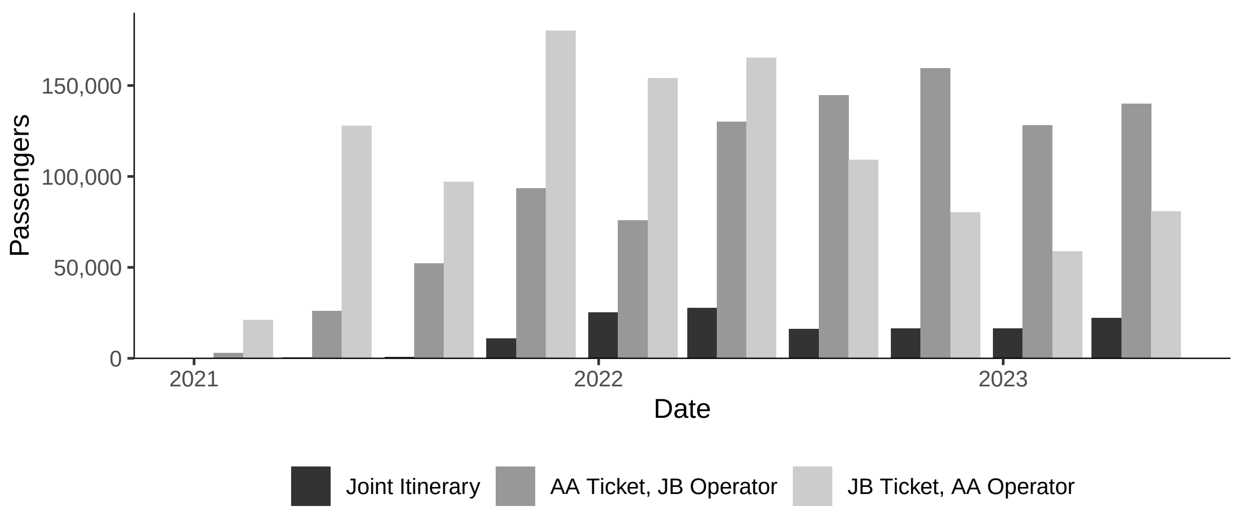
Figure D1: Distribution of Low-Cost and Ultra-Low Cost Carriers




Each market is a Year-Quarter-Origin Airport-Destination Airport ordered quartet. Carriers included in the count of low-cost and ultra-low cost carriers are Southwest, JetBlue, Spirit, Frontier, and Allegiant.

## D.2 Additional Descriptive Figures and Tables: Northeast Alliance

Figure D2: Northeast Alliance Passenger Uptake




A joint itinerary is one in which both JetBlue and American Airlines operated flights on one or more legs of the unidirectional trip. The ticketing carrier collects fares and issues tickets, the operating carrier operates the flights. Itineraries are classified as an "AA Ticket, JB Operator" if the entire itinerary was issued by American Airlines and JetBlue operated at least one leg of the trip.

Table D1: NEA Codesharing Products

| | 2021Q1 | 2021Q2 | 2021Q3 | 2021Q4 | 2022Q1 | 2022Q2 | 2022Q3 | 2022Q4 | 2023Q1 | 2023Q2 | 2023Q3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **All Markets** | | | | | | | | | | | |
| JetBlue Only | 843 | 1375 | 1327 | 1374 | 1363 | 1583 | 1531 | 1456 | 1412 | 1562 | 1640 |
| JetBlue American Required | 10 | 22 | 25 | 17 | 24 | 27 | 21 | 29 | 18 | 41 | 35 |
| JetBlue-American Joint | 0 | 0 | 0 | 67 | 90 | 69 | 50 | 85 | 74 | 134 | 90 |
| American Only | 4487 | 6728 | 7534 | 7351 | 7119 | 7596 | 8099 | 8338 | 7742 | 8173 | 8434 |
| American JetBlue Required | 61 | 90 | 86 | 87 | 84 | 88 | 87 | 75 | 81 | 81 | 86 |
| American-JetBlue Joint | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 2 | 6 | 3 |
| **Spirit Markets** | | | | | | | | | | | |
| JetBlue Only | 338 | 438 | 420 | 447 | 409 | 517 | 490 | 540 | 554 | 644 | 676 |
| JetBlue American Required | 4 | 11 | 6 | 9 | 10 | 15 | 12 | 14 | 11 | 17 | 12 |
| JetBlue-American Joint | 0 | 0 | 0 | 22 | 26 | 20 | 16 | 27 | 25 | 44 | 33 |
| American Only | 1161 | 1491 | 1694 | 1849 | 1773 | 2012 | 2112 | 2340 | 2309 | 2563 | 2666 |
| American JetBlue Required | 16 | 28 | 28 | 30 | 27 | 31 | 16 | 23 | 21 | 25 | 28 |
| American-JetBlue Joint | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Each row indicates the number of products within a given quarter that belong to each classification. A ”Firm Only” product is one in which the product had no codesharing flights included within it. A ”JetBlue American Required” product is one in which all itineraries credited to the JetBlue for that quarter had all legs operated by American. A ”JetBlue-American Joint” product is one where at least one leg was operated by each firm. A Spirit Market is one in which Spirit operated within it during the given quarter of interest.

Figure D3: NEA: Overlapped Operating Routes

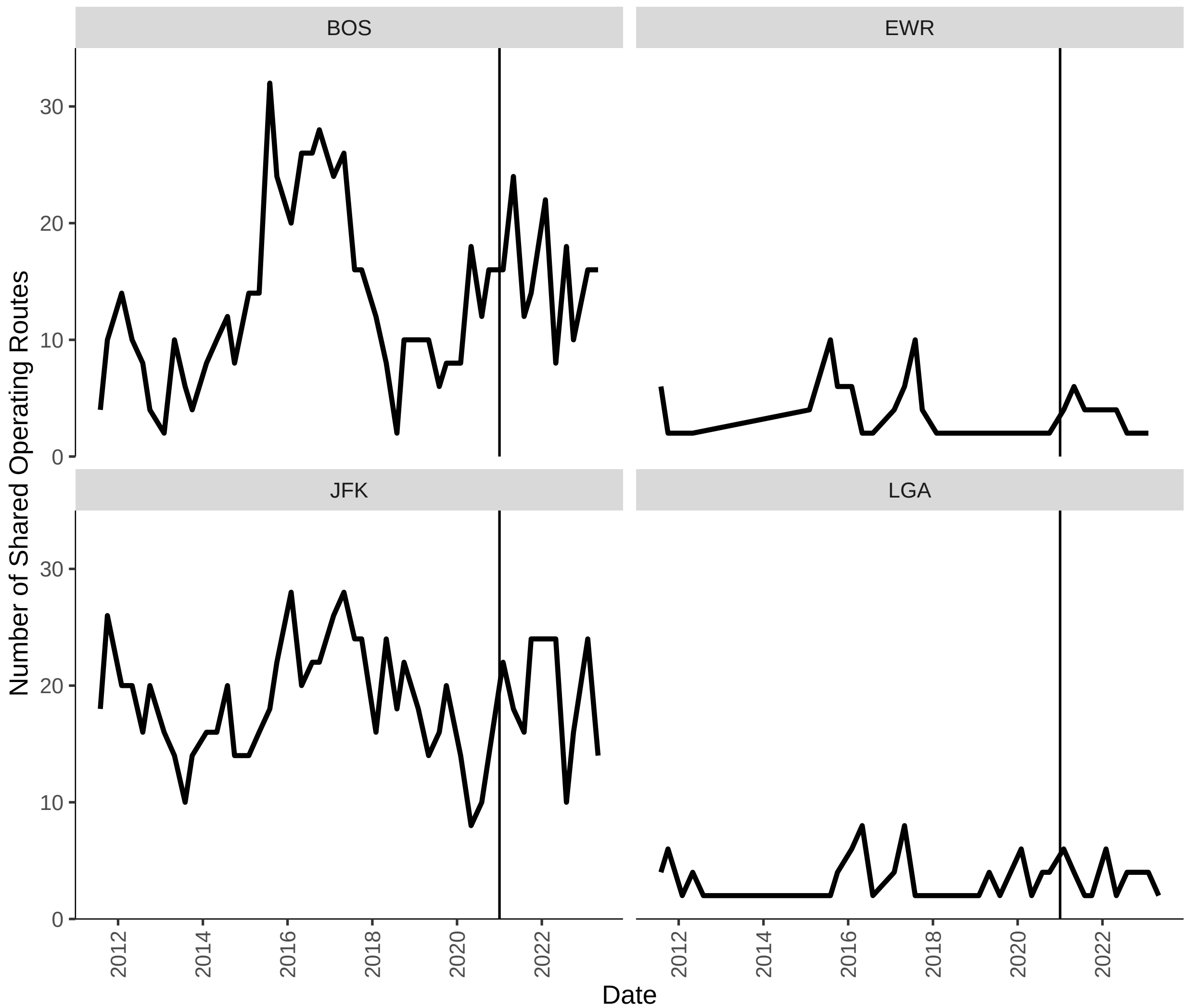
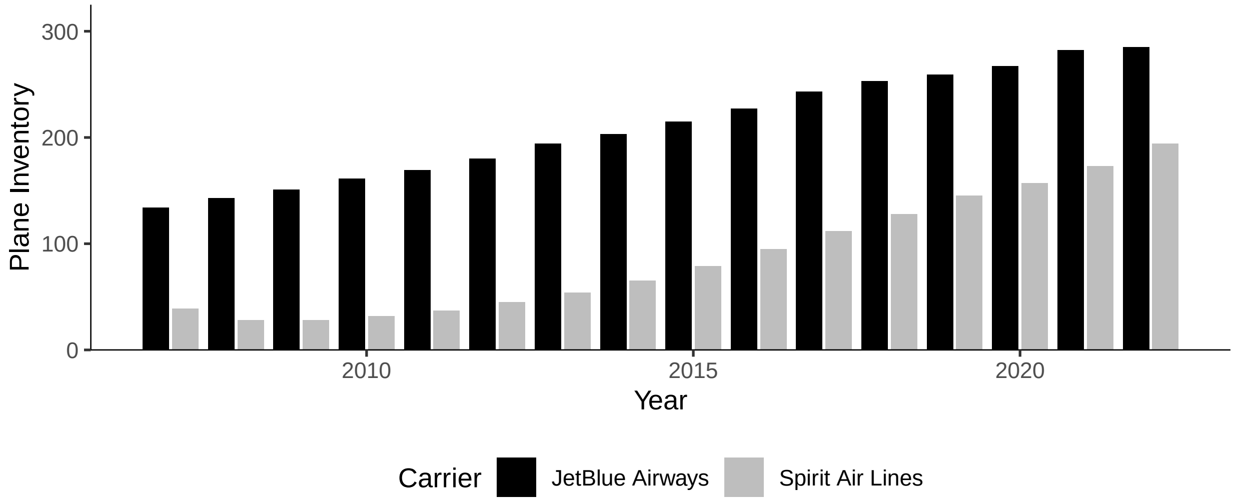



Figure plots the number of routes operated by both JetBlue and American within a given quarter. The vertical line represents the start of the Northeast Alliance in January 2021.

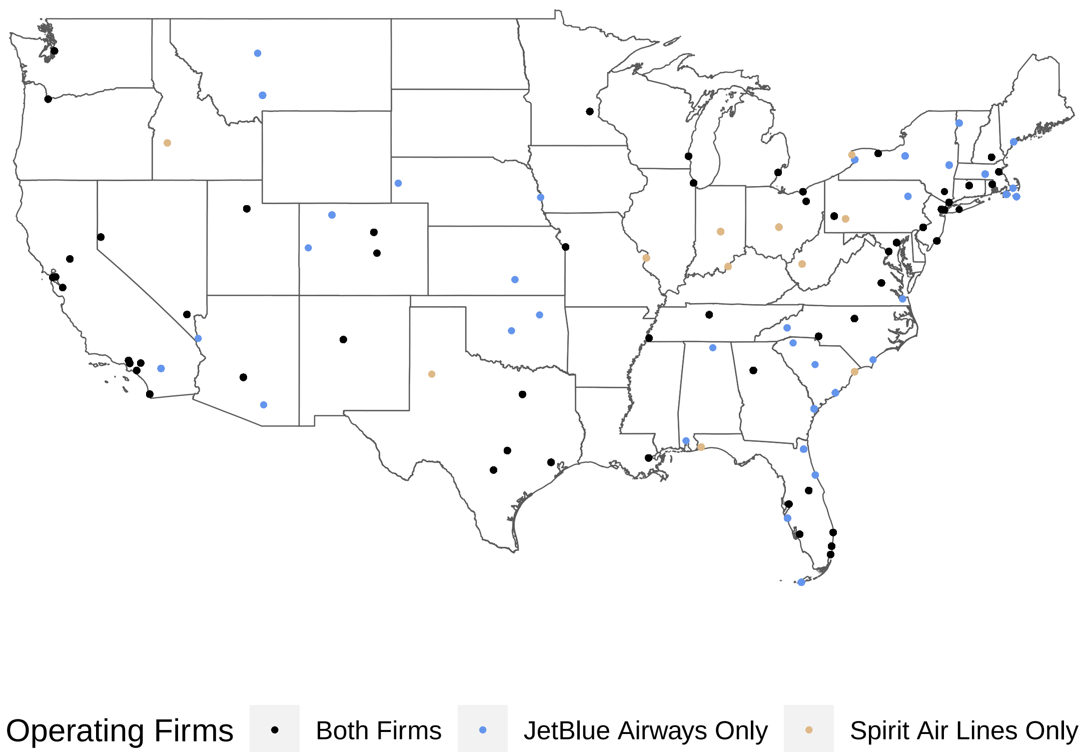
## D.3 Descriptive Figures and Tables: JetBlue, Spirit

Figure D4: JetBlue, Spirit Fleet Size Over Time




Source: B-43 Inventory Data. Each bar is the number of airplanes in a given firm's inventory within a given year.

Figure D5: JetBlue, Spirit Airports - 2022




Derived from DB1B Data. Beyond the United States mainland, both carriers operated in Puerto Rico.

Table D2: American, JetBlue Overlap at NEA Airports

| | JFK | | BOS | | LGA | | EWR | |
|---|---|---|---|---|---|---|---|---|
| Year | Ticket | Operating | Ticket | Operating | Ticket | Operating | Ticket | Operating |
| **Q1** | | | | | | | | |
| 2023 | 75.4 | 23.7 | 69.1 | 21.4 | 67.3 | 4.2 | 46.7 | 7.7 |
| 2022 | 77.0 | 29.7 | 75.0 | 29.1 | 73.9 | 8.9 | 47.6 | 8.3 |
| 2021 | 18.6 | 24.4 | 26.8 | 21.7 | 50.0 | 33.3 | 9.5 | 13.6 |
| 2019 | 22.4 | 23.3 | 22.9 | 20.0 | 8.1 | 6.7 | 0.0 | 0.0 |
| **Q2** | | | | | | | | |
| 2023 | 70.0 | 15.9 | 63.1 | 22.2 | 68.3 | 5.4 | 46.7 | 7.7 |
| 2022 | 68.3 | 26.5 | 70.3 | 21.9 | 75.0 | 6.4 | 45.5 | 17.4 |
| 2021 | 57.7 | 21.1 | 57.4 | 28.6 | 27.3 | 7.4 | 28.6 | 13.6 |
| 2019 | 21.1 | 21.0 | 21.2 | 25.0 | 8.9 | 5.6 | 0.0 | 0.0 |
| **Q3** | | | | | | | | |
| 2023 | 69.0 | 16.9 | 63.9 | 19.0 | 61.0 | 4.1 | 40.0 | 7.7 |
| 2022 | 73.8 | 21.9 | 73.8 | 24.2 | 75.9 | 6.4 | 57.1 | 7.1 |
| 2021 | 63.6 | 25.9 | 58.9 | 23.1 | 30.4 | 3.2 | 37.5 | 14.8 |
| 2019 | 19.6 | 20.3 | 21.6 | 21.6 | 8.9 | 5.6 | 0.0 | 0.0 |
| **Q4** | | | | | | | | |
| 2022 | 72.1 | 25.4 | 66.1 | 21.1 | 69.8 | 2.0 | 46.7 | 7.7 |
| 2021 | 71.9 | 25.8 | 73.2 | 23.2 | 75.0 | 4.3 | 43.5 | 7.7 |
| 2019 | 15.3 | 17.5 | 22.0 | 19.2 | 6.8 | 5.4 | 0.0 | 0.0 |

Each cell is the percent of markets originating from the specified airport with both carriers present in the market as either the ticketing carrier or operating carrier. Ticketing carriers are responsible for buying and selling of tickets while the operating carrier handles flight operations. Data for the first quarter of 2021 should be interpreted cautiously as this was before widespread vaccination availability.

Table D3: JetBlue and Spirit: Overlap Cities - 2022

| City | Firm Passengers | Total Passengers | Share |
|---|---|---|---|
| Ponce, PR | 106320 | 106320 | 1.000 |
| Aguadilla, PR | 251180 | 321170 | 0.782 |
| San Juan, PR | 1848180 | 4149260 | 0.445 |
| Boston, MA | 4262240 | 12136460 | 0.351 |
| West Palm Beach/Palm Beach, FL | 919690 | 2960650 | 0.311 |
| Miami, FL | 5885260 | 19049140 | 0.309 |
| Charlotte Amalie, VI | 155220 | 584450 | 0.266 |
| New York, NY | 8243150 | 32401400 | 0.254 |
| Hartford, CT | 596840 | 2358950 | 0.253 |
| Orlando, FL | 4890200 | 19981730 | 0.245 |
| Fort Myers, FL | 964970 | 4577540 | 0.211 |
| Detroit, MI | 1330090 | 7481070 | 0.178 |
| Cleveland, OH | 567000 | 3537960 | 0.160 |
| Richmond, VA | 235760 | 1474130 | 0.160 |
| New Orleans, LA | 774190 | 4909390 | 0.158 |
| Las Vegas, NV | 2783710 | 18384770 | 0.151 |
| Tampa, FL | 1371860 | 9955070 | 0.138 |
| Pittsburgh, PA | 391900 | 3023570 | 0.130 |
| Los Angeles, CA | 2839960 | 22400620 | 0.127 |
| Philadelphia, PA | 844170 | 7694760 | 0.110 |

Derived from DB1B Data. Cities are ordered by the combined share of passengers who used JetBlue or Spirit flights as a share of the total passengers departing from the city within 2022. Cities in which only one firm operates are excluded.

### D.4 Additional Merger Figures

Table D4: Market Level Summary Statistics (By Competition Structure)

| | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | |
| **Spirit Markets** | | | | | |
| Minimum Miles (1000s) | 1.3 | (0.61) | 0.18 | 1.14 | 2.81 |
| Average Miles (1000s) | 1.35 | (0.66) | 0.18 | 1.19 | 4.39 |
| Number of Firms | 4.8 | (1.37) | 1 | 5 | 9 |
| Number of Products | 6.53 | (2.25) | 1 | 7 | 14 |
| Number of Customers | 51859.49 | (48793.03) | 300 | 37600 | 360320 |
| HHI | 8225.48 | (4382.4) | 1622.69 | 7360.39 | 56397.84 |
| Observations | 5941 | | | | |
| **JetBlue & Spirit Markets** | | | | | |
| Minimum Miles (1000s) | 1.44 | (0.71) | 0.32 | 1.17 | 2.78 |
| Average Miles (1000s) | 1.47 | (0.73) | 0.32 | 1.19 | 2.9 |
| Number of Firms | 6.17 | (1.06) | 2 | 6 | 9 |
| Number of Products | 8.51 | (2) | 3 | 8 | 15 |
| Number of Customers | 80495.06 | (53421.42) | 1300 | 69680 | 344530 |
| HHI | 6750.6 | (2646.51) | 1680.29 | 6247.49 | 17066.21 |
| Observations | 1533 | | | | |
| **Post-Pandemic** | | | | | |
| **Spirit Markets** | | | | | |
| Minimum Miles (1000s) | 1.32 | (0.6) | 0.18 | 1.22 | 2.81 |
| Average Miles (1000s) | 1.37 | (0.63) | 0.18 | 1.26 | 2.92 |
| Number of Firms | 5.11 | (1.24) | 2 | 5 | 8 |
| Number of Products | 6.55 | (2.01) | 2 | 6 | 13 |
| Number of Customers | 36898.62 | (37432.1) | 410 | 24260 | 214550 |
| HHI | 7648.74 | (3855.01) | 1750.61 | 7023.19 | 19917.19 |
| Observations | 7569 | | | | |
| **JetBlue & Spirit Markets** | | | | | |
| Minimum Miles (1000s) | 1.52 | (0.67) | 0.2 | 1.26 | 2.79 |
| Average Miles (1000s) | 1.56 | (0.69) | 0.2 | 1.35 | 2.9 |
| Number of Firms | 6.34 | (0.94) | 3 | 6 | 9 |
| Number of Products | 8.78 | (1.78) | 3 | 9 | 14 |
| Number of Customers | 73002.09 | (54873.21) | 2250 | 59070 | 261740 |
| HHI | 6635.64 | (2769.53) | 1730.25 | 6207.7 | 17230.6 |
| Observations | 1554 | | | | |

Table D5: Pre-Pandemic Instrument Comparison Table

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 | Model 9 |
|---|---|---|---|---|---|---|---|---|---|
| Price | $-0.42^{***}$ | $-4.97^{***}$ | $-0.18^{**}$ | $-0.18^{**}$ | $-2.12^{***}$ | $-0.14^{*}$ | $-2.09^{***}$ | $-2.28^{***}$ | $-2.23^{***}$ |
| | (0.00) | (0.09) | (0.06) | (0.06) | (0.04) | (0.06) | (0.04) | (0.03) | (0.03) |
| Nesting | $0.55^{***}$ | $0.42^{***}$ | $-0.14^{***}$ | $-0.14^{***}$ | $0.12^{***}$ | $-0.14^{***}$ | $0.12^{***}$ | $0.18^{***}$ | $0.18^{***}$ |
| | (0.00) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.00) | (0.00) |
| Products in Market | | X | X | X | X | X | X | X | X |
| Gas Instruments | | X | | | X | | X | | X |
| Hub Interactions | | | X | X | X | X | X | X | X |
| Gandhi Instruments | | | | | | X | X | X | X |
| Exog Interactions | | | | | | | | X | X |
| Price Test | | 101307.015 | 94273.624 | 94273.624 | 87736.444 | 94159.23 | 87480.095 | 78369.648 | 77831.661 |
| p-Value | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Test of Over Identification | | N/A | 4187.14 | 4187.14 | 7279.16 | 4283.57 | 7526.31 | 11166.96 | 11605.17 |
| p-value | | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R-Squared | 0.66 | −0.96 | 0.32 | 0.32 | 0.27 | 0.31 | 0.28 | 0.27 | 0.28 |
| Adj. R-Squared | 0.66 | −0.96 | 0.32 | 0.32 | 0.27 | 0.31 | 0.28 | 0.27 | 0.28 |
| Mean Elasticity | −0.99 | −11.62 | −0.42 | −0.42 | −4.96 | −0.32 | −4.88 | −5.32 | −5.21 |
| Median Elasticity | −1.00 | −11.74 | −0.42 | −0.42 | −5.01 | −0.33 | −4.93 | −5.37 | −5.27 |
| Share Inelastic Products | 0.51 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Share JB Inelastic Products | 0.67 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Share SP Inelastic Products | 0.88 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Num. obs. | 307289 | 307289 | 307289 | 307289 | 307289 | 307289 | 307289 | 307289 | 307289 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Table D6: Post-Pandemic Instrument Comparison Table

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 | Model 7 | Model 8 | Model 9 |
|---|---|---|---|---|---|---|---|---|---|
| Price | $-0.24^{***}$ | $-0.06$ | $1.50^{***}$ | $1.50^{***}$ | $0.01$ | $1.28^{***}$ | $-0.00$ | $-2.46^{***}$ | $-0.63^{***}$ |
| | (0.00) | (0.03) | (0.16) | (0.16) | (0.03) | (0.15) | (0.03) | (0.07) | (0.03) |
| Nesting | $0.54^{***}$ | $-0.11^{***}$ | $-0.26^{***}$ | $-0.26^{***}$ | $-0.11^{***}$ | $-0.24^{***}$ | $-0.11^{***}$ | $0.15^{***}$ | $0.01^{**}$ |
| | (0.00) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.00) | (0.01) | (0.00) |
| Products in Market | | X | X | X | X | X | X | X | X |
| Gas Instruments | | X | | | X | | X | | X |
| Hub Interactions | | | X | X | X | X | X | X | X |
| Gandhi Instruments | | | | | | X | X | X | X |
| Exog Interactions | | | | | | | | X | X |
| Price Test | | 77288.49 | 81853.459 | 81853.459 | 76910.107 | 81743.441 | 76883.509 | 66904.122 | 64536.553 |
| p-Value | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Test of Over Identification | | N/A | 1269.2 | 1269.2 | 4165.87 | 1453.45 | 4271.75 | 7094.09 | 11604.74 |
| p-value | | N/A | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| R-Squared | 0.65 | 0.34 | 0.02 | 0.02 | 0.34 | 0.09 | 0.34 | 0.16 | 0.42 |
| Adj. R-Squared | 0.65 | 0.34 | 0.02 | 0.02 | 0.34 | 0.08 | 0.34 | 0.16 | 0.42 |
| Mean Elasticity | −0.50 | −0.14 | 3.19 | 3.19 | 0.02 | 2.72 | 0.00 | −5.22 | −1.34 |
| Median Elasticity | −0.50 | −0.13 | 3.14 | 3.14 | 0.02 | 2.69 | 0.00 | −5.15 | −1.33 |
| Share Inelastic Products | 1.00 | 1.00 | 0.02 | 0.02 | 1.00 | 0.04 | 1.00 | 0.00 | 0.23 |
| Share JB Inelastic Products | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.01 | 1.00 | 0.00 | 0.30 |
| Share SP Inelastic Products | 1.00 | 1.00 | 0.11 | 0.11 | 1.00 | 0.22 | 1.00 | 0.00 | 0.84 |
| Num. obs. | 265196 | 265196 | 265196 | 265196 | 265196 | 265196 | 265196 | 265196 | 265196 |

$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

Figure D6: Distribution in Changes of Average Market Fare - Pre-Pandemic

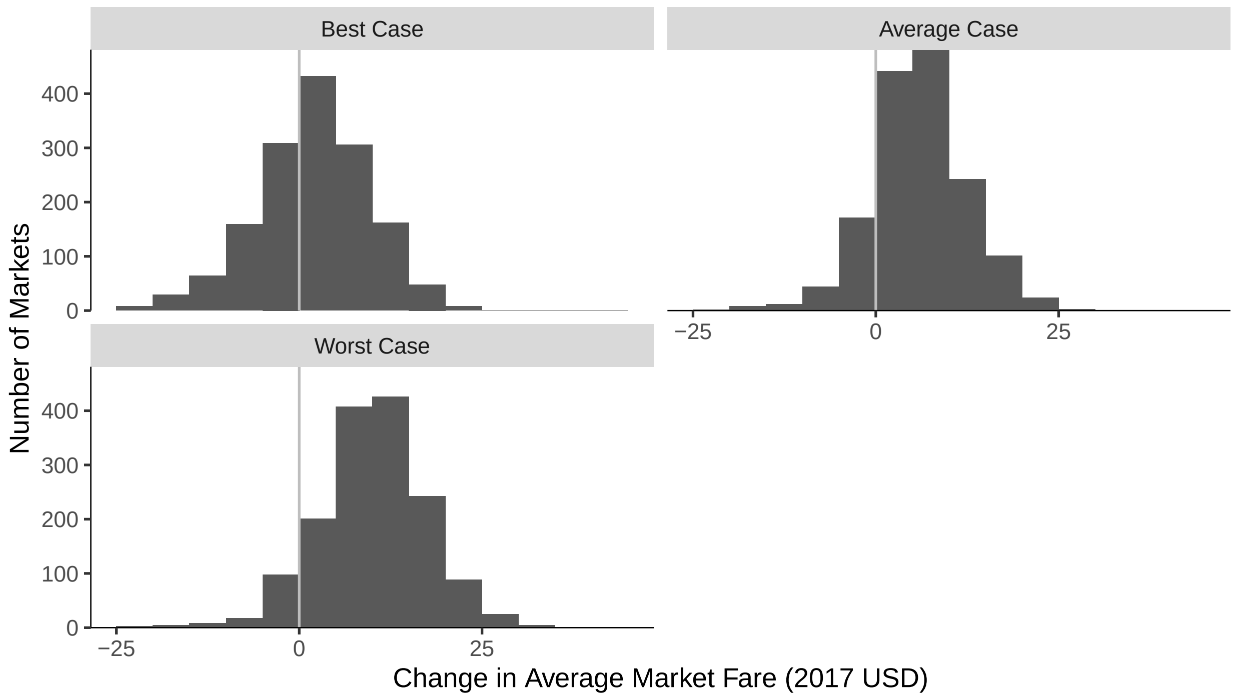



Figure D7: Distribution in Changes of Average Market Fare - Post-Pandemic

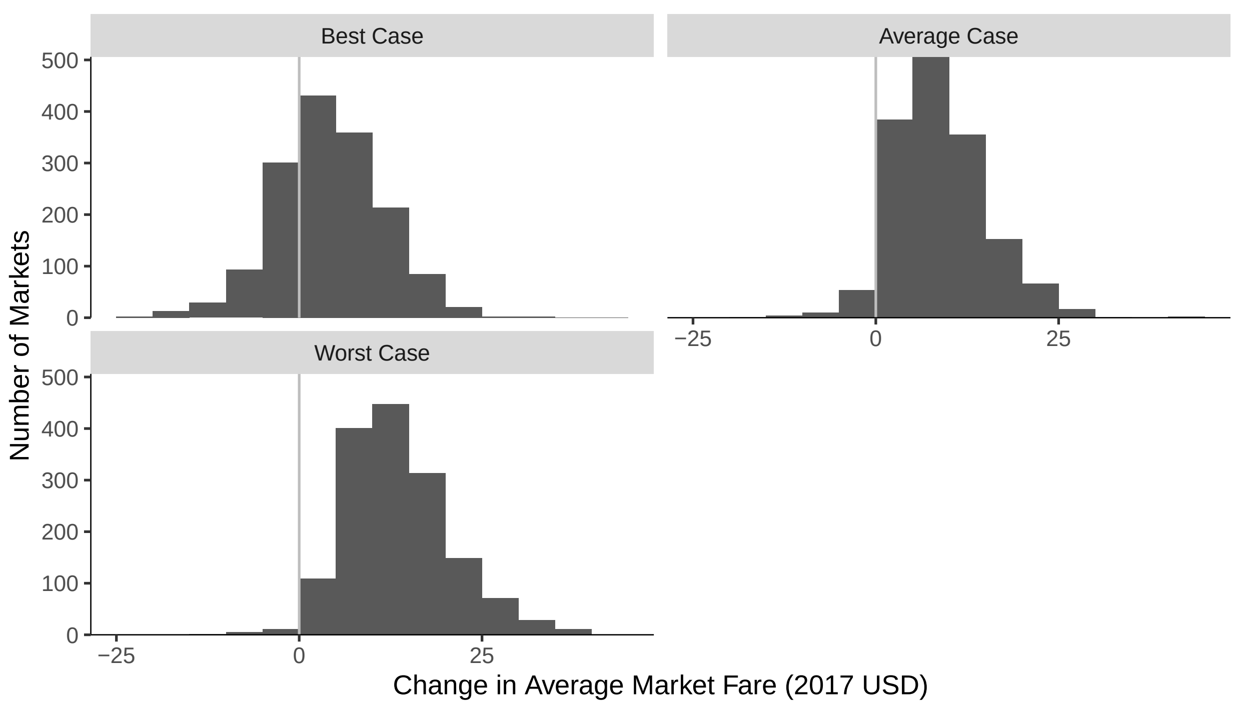


Table D7: Change in Minimum Fare Available in Market (Percent)

| | Pre-Pandemic | | | Post-Pandemic | | |
|---|---|---|---|---|---|---|
| | Best | Average | Worst | Best | Average | Worst |
| $< 0$ | 422 | 203 | 171 | 374 | 467 | 385 |
| 0-20 | 992 | 279 | 204 | 1056 | 264 | 262 |
| 20-40 | 62 | 294 | 242 | 57 | 252 | 219 |
| 40-60 | 28 | 251 | 306 | 27 | 162 | 200 |
| 60-80 | 16 | 181 | 215 | 18 | 137 | 162 |
| $80 <$ | 13 | 325 | 395 | 22 | 272 | 326 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobservables. A version of this table which reports the change in minimum fares in terms of 2017 dollars is included as Table 8.

# E Robustness Checks

## E.1 Assumed Merger Efficiencies

In this section, I consider an alternative simulation method where for each case identified in the main text (Section 4.3), I additionally assume that the merged firm realizes efficiencies of either 5% or 10%. The results of this simulation for the 5% case are reported in Table E1 and the results for the 10% case in Table E2. Minimum fare in market changes are reported in Tables E3 and E4.

Table E1: Simulated Price Effects of Merger with 5% Efficiency Gain - Joint Markets

| | N | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 12074 | 2.04 | (0.69) | 0.47 | 1.98 | 4.91 |
| Best Case | 10106 | 2.06 | (0.67) | 0.46 | 2.01 | 5.08 |
| Average Case | 10106 | 2.1 | (0.64) | 0.46 | 2.04 | 5.14 |
| Worst Case | 10106 | 2.15 | (0.64) | 0.48 | 2.08 | 5.13 |
| **Market Average Price** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.7 | (0.61) | 0.79 | 1.52 | 3.44 |
| Average Case | 1418 | 1.97 | (0.51) | 0.99 | 1.88 | 3.37 |
| Worst Case | 1418 | 2 | (0.5) | 0.99 | 1.9 | 3.49 |
| **% Change Average Price** | | | | | | |
| Best Case | 1418 | -16.62 | (17.31) | -54.03 | -18.81 | 31.39 |
| Average Case | 1418 | -2.16 | (10.5) | -40.03 | -2.04 | 38.88 |
| Worst Case | 1418 | -0.71 | (10.38) | -34.5 | -0.51 | 37.08 |
| **Median Price** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.7 | (0.61) | 0.79 | 1.52 | 3.44 |
| Average Case | 1418 | 1.97 | (0.51) | 0.99 | 1.88 | 3.37 |
| Worst Case | 1418 | 2 | (0.5) | 0.99 | 1.9 | 3.49 |
| **Post-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 13650 | 1.96 | (0.78) | 0.35 | 1.89 | 5.25 |
| Best Case | 11496 | 2 | (0.77) | 0.4 | 1.93 | 5.34 |
| Average Case | 11496 | 2.04 | (0.75) | 0.4 | 1.97 | 5.34 |
| Worst Case | 11496 | 2.09 | (0.74) | 0.41 | 2.02 | 5.33 |
| **Market Average Price** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.68 | (0.67) | 0.6 | 1.64 | 3.61 |
| Average Case | 1554 | 2.01 | (0.63) | 0.75 | 1.92 | 3.8 |
| Worst Case | 1554 | 2.04 | (0.64) | 0.76 | 1.94 | 3.91 |
| **% Change Average Price** | | | | | | |
| Best Case | 1554 | -15.49 | (18.28) | -60.19 | -13.02 | 38.4 |
| Average Case | 1554 | 2.74 | (10.1) | -32.13 | 2.36 | 48.9 |
| Worst Case | 1554 | 4.44 | (10.13) | -33.27 | 4.09 | 50.36 |
| **Median Price** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.68 | (0.67) | 0.6 | 1.64 | 3.61 |
| Average Case | 1554 | 2.01 | (0.63) | 0.75 | 1.92 | 3.8 |
| Worst Case | 1554 | 2.04 | (0.64) | 0.76 | 1.94 | 3.91 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Each simulation additionally assumes that the merged firm's marginal cost additionally decreases by 10%. Prices are in 2017 dollars.

Table E2: Simulated Price Effects of Merger with 10% Efficiency Gain - Joint Markets

| | N | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 12074 | 2.04 | (0.69) | 0.47 | 1.98 | 4.91 |
| Best Case | 10106 | 2.05 | (0.67) | 0.46 | 2 | 5.08 |
| Average Case | 10106 | 2.09 | (0.64) | 0.46 | 2.03 | 5.13 |
| Worst Case | 10106 | 2.13 | (0.64) | 0.48 | 2.06 | 5.13 |
| **Market Average Price** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.67 | (0.61) | 0.77 | 1.47 | 3.44 |
| Average Case | 1418 | 1.94 | (0.51) | 0.96 | 1.84 | 3.36 |
| Worst Case | 1418 | 1.97 | (0.5) | 0.98 | 1.88 | 3.49 |
| **% Change Average Price** | | | | | | |
| Best Case | 1418 | -18.2 | (17.76) | -54.99 | -20.68 | 31.36 |
| Average Case | 1418 | -3.78 | (10.78) | -41.3 | -3.96 | 38.13 |
| Worst Case | 1418 | -1.78 | (10.59) | -34.78 | -1.9 | 36.73 |
| **Median Price** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.67 | (0.61) | 0.77 | 1.47 | 3.44 |
| Average Case | 1418 | 1.94 | (0.51) | 0.96 | 1.84 | 3.36 |
| Worst Case | 1418 | 1.97 | (0.5) | 0.98 | 1.88 | 3.49 |
| **Post-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 13650 | 1.96 | (0.78) | 0.35 | 1.89 | 5.25 |
| Best Case | 11496 | 1.99 | (0.78) | 0.4 | 1.91 | 5.34 |
| Average Case | 11496 | 2.03 | (0.75) | 0.4 | 1.96 | 5.34 |
| Worst Case | 11496 | 2.07 | (0.74) | 0.41 | 2 | 5.33 |
| **Market Average Price** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.64 | (0.65) | 0.59 | 1.6 | 3.53 |
| Average Case | 1554 | 1.98 | (0.63) | 0.75 | 1.9 | 3.76 |
| Worst Case | 1554 | 2.02 | (0.63) | 0.76 | 1.93 | 3.88 |
| **% Change Average Price** | | | | | | |
| Best Case | 1554 | -17.46 | (18.33) | -61.06 | -15.42 | 37.34 |
| Average Case | 1554 | 1.05 | (10.34) | -33.82 | 0.53 | 48.69 |
| Worst Case | 1554 | 3.3 | (10.36) | -33.26 | 2.78 | 50.31 |
| **Median Price** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.64 | (0.65) | 0.59 | 1.6 | 3.53 |
| Average Case | 1554 | 1.98 | (0.63) | 0.75 | 1.9 | 3.76 |
| Worst Case | 1554 | 2.02 | (0.63) | 0.76 | 1.93 | 3.88 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Each simulation additionally assumes that the merged firm's marginal cost additionally decreases by 10%. Prices are in 2017 dollars.

Table E3: 5% Efficiency Case: Change in Minimum Fare Available in Market

| | Pre-Pandemic | | | Post-Pandemic | | |
|---|---|---|---|---|---|---|
| | Best | Average | Worst | Best | Average | Worst |
| $< 20$ | 1407 | 928 | 772 | 1437 | 923 | 791 |
| 20-40 | 61 | 434 | 311 | 53 | 388 | 265 |
| 40-60 | 31 | 120 | 293 | 30 | 165 | 250 |
| 60-80 | 22 | 38 | 132 | 23 | 57 | 159 |
| $80 <$ | 12 | 13 | 25 | 11 | 21 | 89 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Each simulation additionally assumes that the merged firm's marginal cost additionally decreases by 5%. Prices are in 2017 dollars.

Table E4: 10% Efficiency Case: Change in Minimum Fare Available in Market

| | Pre-Pandemic | | | Post-Pandemic | | |
|---|---|---|---|---|---|---|
| | Best | Average | Worst | Best | Average | Worst |
| $< 20$ | 1425 | 1032 | 820 | 1445 | 1021 | 814 |
| 20-40 | 49 | 372 | 319 | 47 | 353 | 285 |
| 40-60 | 28 | 89 | 265 | 34 | 130 | 254 |
| 60-80 | 19 | 28 | 107 | 18 | 32 | 137 |
| $80 <$ | 12 | 12 | 22 | 10 | 18 | 64 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Each simulation additionally assumes that the merged firm's marginal cost additionally decreases by 10%. Prices are in 2017 dollars.

## E.2 Nested Logit Model Specification

In this subsection, I estimate a nested logit demand model and then re-conduct the merger simulation. Mathematically, this model is equivalent to estimating the Demand model described in Section 4.1 but with the additional constraint that each $\nu$ parameter is assumed equal to zero. As such, individual consumer deviations from the mean utility of a given product are determined solely by the random error term $\epsilon_{ijt}$. The results of this exercise are presented in Table E5. The estimated demand coefficients are broadly similar to the coefficients presented in Table 5, but it is worth noting that the estimated elasticities are lower (higher) in the pre-pandemic (post-pandemic) period for the nested-logit estimates than for the random coefficient nested logit estimates.

Following the re-estimation of demand, I once more simulate the JetBlue-Spirit merger across the three scenarios described in Section 4.3. The key results for these simulations are described within Tables E6 and E7. The results are consistent with the results presented within the main text.

Table E5: Demand Estimation Results - Nested Logit

| Variable | Pre-Pandemic | Post-Pandemic |
|---|---|---|
| **Linear Coefficients** | | |
| Price | -2.27*** | -2.1*** |
| | (0.036) | (0.069) |
| Nonstop | 0.877*** | 1.23*** |
| | (0.014) | (0.016) |
| Miles Flown | 1.28*** | 1.98*** |
| | (0.028) | (0.067) |
| Miles Flown$^2$ | -0.116*** | -0.277*** |
| | (0.0056) | (0.01) |
| Origin Prescence | 0.0114*** | 0.00764*** |
| | (0.00013) | (0.00013) |
| Extra Miles | -2.5*** | -2.18*** |
| | (0.031) | (0.038) |
| Extra Miles$^2$ | 1.54*** | 0.412*** |
| | (0.023) | (0.043) |
| Tourist Route | 0.0147 | 0.166*** |
| | (0.0074) | (0.008) |
| **Nesting Coefficient** | | |
| Nesting Parameter | 0.162*** | 0.123*** |
| | (0.0048) | (0.0063) |
| **Summary Statistics** | | |
| Period | 2017Q1-2019Q4 | 2021Q2-2023Q2 |
| N Products | 265196 | 307289 |
| N Markets | 70016 | 87363 |
| Mean Elasticity | -4.831 | -5.962 |
| Spirit Mean Elasticity | -2.71 | -4.19 |
| JetBlue Mean Elasticity | -4.64 | -5.51 |
| Mean Markup | 0.243 | 0.19 |

$^{***}p < 0.01$; $^{**}p < 0.05$; $^{*}p < 0.1$ Products are defined as a Carrier-Nonstop pair within an Origin-Destination-Year-Quarter market. Origin Service Ratio is the fraction of direct routes out of the originating airport operated by the carrier divided by the total number of direct routes originating from that airport. Extra Miles is the average additional miles flown with a connecting itinerary minus the minimum miles flown within a market. A tourist product has at least one endpoint in either the Las Vegas or Florida.

Table E6: Simulated Price Effects of Merger - Joint Markets, Nested Logit Demand

| | N | Mean | (SD) | Minimum | Median | Maximum |
|---|---|---|---|---|---|---|
| **Pre-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 12074 | 2.04 | (0.69) | 0.47 | 1.98 | 4.91 |
| Best Case | 10106 | 2.08 | (0.66) | 0.47 | 2.03 | 4.9 |
| Average Case | 10106 | 2.12 | (0.64) | 0.48 | 2.06 | 4.91 |
| Worst Case | 10106 | 2.17 | (0.64) | 0.48 | 2.1 | 4.91 |
| **Market Average Price (100s, 2017 USD)** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.74 | (0.6) | 0.85 | 1.56 | 3.46 |
| Average Case | 1418 | 2 | (0.51) | 1.02 | 1.91 | 3.5 |
| Worst Case | 1418 | 2.02 | (0.5) | 1.01 | 1.92 | 3.47 |
| **% Change Average Price** | | | | | | |
| Best Case | 1418 | -14.37 | (16.63) | -51.23 | -15.59 | 31.98 |
| Average Case | 1418 | -0.5 | (10.52) | -39.74 | -0.04 | 31.01 |
| Worst Case | 1418 | 0.59 | (10.31) | -34.8 | 0.76 | 45.95 |
| **Median Price (100s, 2017 USD)** | | | | | | |
| Observed | 1418 | 2.01 | (0.43) | 0.93 | 1.95 | 3.1 |
| Best Case | 1418 | 1.74 | (0.6) | 0.85 | 1.56 | 3.46 |
| Average Case | 1418 | 2 | (0.51) | 1.02 | 1.91 | 3.5 |
| Worst Case | 1418 | 2.02 | (0.5) | 1.01 | 1.92 | 3.47 |
| **Post-Pandemic** | | | | | | |
| **Product Prices (100s, 2017 USD)** | | | | | | |
| Observed | 13650 | 1.96 | (0.78) | 0.35 | 1.89 | 5.25 |
| Best Case | 11496 | 2.01 | (0.77) | 0.4 | 1.94 | 5.25 |
| Average Case | 11496 | 2.05 | (0.74) | 0.4 | 1.99 | 5.25 |
| Worst Case | 11496 | 2.1 | (0.74) | 0.4 | 2.04 | 5.25 |
| **Market Average Price (100s, 2017 USD)** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.76 | (0.69) | 0.62 | 1.72 | 3.73 |
| Average Case | 1554 | 2.05 | (0.64) | 0.76 | 1.96 | 3.96 |
| Worst Case | 1554 | 2.06 | (0.64) | 0.76 | 1.96 | 3.99 |
| **% Change Average Price** | | | | | | |
| Best Case | 1554 | -11.26 | (17.74) | -58.26 | -8.07 | 42.55 |
| Average Case | 1554 | 4.65 | (9.96) | -30.26 | 4.39 | 48.79 |
| Worst Case | 1554 | 5.59 | (10) | -31.53 | 5.37 | 50.12 |
| **Median Price (100s, 2017 USD)** | | | | | | |
| Observed | 1554 | 1.95 | (0.55) | 0.65 | 1.89 | 3.57 |
| Best Case | 1554 | 1.76 | (0.69) | 0.62 | 1.72 | 3.73 |
| Average Case | 1554 | 2.05 | (0.64) | 0.76 | 1.96 | 3.96 |
| Worst Case | 1554 | 2.06 | (0.64) | 0.76 | 1.96 | 3.99 |

Products from markets without both JetBlue and Spirit present are excluded. Corresponding results for demand estimated using a random coefficient nested logit model are included as Table 6 within the main text.

Table E7: Change in Minimum Fare Available in Market (2017 USD), Nested Logit Demand

| | Pre-Pandemic | | | Post-Pandemic | | |
|---|---|---|---|---|---|---|
| | Best | Average | Worst | Best | Average | Worst |
| $< 0$ | 298 | 237 | 261 | 398 | 273 | 196 |
| 0-20 | 1096 | 608 | 476 | 1030 | 572 | 566 |
| 20-40 | 66 | 450 | 304 | 54 | 385 | 256 |
| 40-60 | 37 | 177 | 288 | 36 | 219 | 252 |
| 60-80 | 20 | 45 | 162 | 25 | 79 | 183 |
| $80 <$ | 16 | 16 | 42 | 11 | 26 | 101 |

Products from markets without both JetBlue and Spirit present are excluded. The best case merger scenario is one in which the combined firm inherits the minimum average cost and greatest unobservables of each firm, the average case merger scenario has the combined JetBlue-Spirit inherit the average of the two firms' product characteristics, and the worst case scenario has the combined JetBlue-Spirit inherit the greatest marginal cost and lowest unobserveables. Prices are in 2017 dollars. Corresponding results for demand estimated using a random coefficient nested logit model are included as Table 6 within the main text.