



# Highly debated but still unbundled: The evolution of U.S. airline ancillary products and pricing strategies

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Received: 10 October 2021 / Accepted: 1 May 2022  
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## Abstract

This paper investigates how airline pricing strategies and revenues have evolved over time for unbundled flight products, using the eight largest U.S. airlines. Findings indicate that ticket exchange fees are being eliminated by network and low-cost carriers. On the other hand, baggage and seat reservation fees have grown more complex, with some carriers moving towards dynamic pricing. Ancillary revenues from unbundled flight products represent an increasing portion of airlines' total operating revenues, especially for ultra low-cost carriers. We estimate that the product unbundling trend has decreased revenues to the U.S. Airport and Airway Trust Fund by 4.0%–4.6% due to untaxed baggage and seat reservation fees alone. We also discuss government policies on ancillary revenue disclosure and pricing transparency, and the global COVID-19 pandemic's impact on ancillaries.

**Keywords** Airlines · Product unbundling · Dynamic pricing · Ancillary fees · Airport and Airway Trust Fund · COVID-19

## Introduction

The global airline industry has faced many financial challenges, with the twenty-first century being a particularly turbulent time. The last two decades have tested airlines greatly in demand, operations, and revenue, ultimately resulting in massive airline consolidation, bankruptcies, and closures across the globe. Shock events, including the September 11, 2001 terrorist attacks in the United States (U.S.), the widespread economic downturn during the Great Recession of 2008, and the ongoing global Coronavirus Disease 2019 (COVID-19) pandemic, have caused worldwide demand for air travel to plummet unexpectedly with impacts felt over multiple years. The energy crisis in the early 2000s increased

the price of crude oil almost five-fold in just 5 years; from \$26.84/barrel in June 2003 to \$127.47 in June 2008 (U.S. Energy Information Administration 2021). Internationally, network carriers faced increased competition as low-cost carriers (LCCs) offered low prices to customers, expanded their networks, and gained market share (CAPA Centre for Aviation 2019). Increased use of the internet for bookings made it easier for customers to purchase the lowest offered fares (Brunger and Perelli 2009). It is evident that airlines rarely experience long, uninterrupted periods of success in the new millennium.

Airlines responded to these financial pressures with product and service innovation to improve their revenue streams. This innovation started with airlines rapidly unbundling the products in their base fares to have an à la carte, fee-based structure where customers pay only for the flight services that they need. New fees were introduced for flight services that were once part of the base fare, including fees for first and second checked bags and fees to select a seat assignment on the plane in advance of the flight's departure. Fees for many existing flight services also increased, such as ticketing exchange fees and on-board checked pet fees (Garrow et al. 2012). As a result, airline ancillary revenues from unbundled flight products increased drastically. For example, after the introduction of new baggage fees, U.S. airlines reported a

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seven-fold increase in baggage fee revenues, from \$464 million in 2007 to \$3.4 billion in 2010 (BTS 2020e).

However, the new fees did not go unnoticed by the traveling public. In stories widely reported by the media, airline customers reported feeling “angry about the new fees” for baggage and “stung by charges” for reserving seats (McCartney 2008; Hume 2012). Members of the U.S. Congress voiced concerns that ancillary fees lacked price transparency and customers would be confused by all of the new add-on fees (U.S. Congress 2010). The newly unbundled product pricing structure created a barrier that prevented customers from easily identifying the lowest offered airfare when accounting for all add-on services required for travel. Any customers attempting to compare competing itineraries using the base airfare plus add-ons were met with a time-consuming and complicated task. This effectively allowed airlines to make additional revenues while dropping the price of the base airfare. After the introduction of baggage fees, base fares decreased by about \$7, whereas the full price of travel (the base airfare plus the baggage fee) increased overall (Brueckner et al. 2015). Ultimately, the issues surrounding price transparency drew the attention of the federal government who passed regulations requiring price transparency protections for consumers (Federal Register 2011a).

The purpose of this paper is to assess the evolution of the U.S. airline product unbundling trend. When the trend first started during the Great Recession, there were questions about how airline revenues would be impacted, how the fees would evolve or dissolve over time, and how federal policies would change in response to ancillary fees (Garrow et al. 2012). Now that the product unbundling trend has matured, there is an opportunity to take a retrospective look that can answer these questions. Our retrospective look is perhaps even more relevant as the industry recently experienced the most significant financial downturn on record due to the ongoing global COVID-19 pandemic. Air passenger demand dropped dramatically throughout the world starting in mid-March 2020 (Suau-Sanchez et al. 2020). Within the U.S., year-over-year domestic air passenger traffic dropped by 95.7% in April 2020, the largest decline in passenger traffic ever recorded (BTS 2020a). Passenger airlines reported net losses of \$5.2 billion in the first quarter and \$11.0 billion in the second quarter of 2020 (BTS 2020b). Passenger airlines have decreased capacity, reduced their networks, and temporarily or permanently reduced their workforce (BTS 2020c; Hotele and Mumbower 2020; Sobieralski 2020). The airline product unbundling trend started in response to difficult industry pressures, and now this paper takes a look back at product unbundling during yet another difficult time period for airlines.

We have two central research questions that are addressed in this study. Our first research question is to determine: How have U.S. airlines changed their pricing strategies for

unbundled flight products since they were introduced over a decade ago? To answer this question, we provide a detailed breakdown of fee structures for two points in time: 2010 and 2021. We also include details about the impact of the global COVID-19 pandemic and discuss the related public policy response from the federal government surrounding the resulting pricing transparency issue. Our second research question is to determine: How has airline dependence on ancillary revenue from unbundled flight products changed over time? For this analysis, we calculate ancillary revenues as a percentage of total operating revenues during 2005–2020 for several different types of unbundled flight products, including baggage fees, ticket exchange/cancellation fees, and seat reservation fees. We then take a closer look at how these ancillary revenue streams are currently impacting the U.S. Airport and Airway Trust Fund (AATF), a funding source for the nation’s air transportation system funded primarily by passenger transport taxes (FAA 2021a, b).

This paper is organized as follows: the second section reviews the literature, and the third section covers data and methodology. The fourth section examines the results and policy issues associated with the results; this section is split into two subsections that address each research question separately. Lastly, the final section provides conclusions.

## Literature review

Price is considered a top influential ticket characteristic on a customer’s decision to purchase (Bukhari et al. 2013). With so much weight put on price, airline product innovation has hinged on increasing price structure complexity to generate revenue. This section looks at existing literature on the two methods used, product unbundling and dynamic pricing, followed by the customer reception.

## Product unbundling

Garrow et al. (2012) documented the early stages of the “ancillary revenue phenomenon” observed in the U.S. and provided a snapshot in time of the ancillary fee structures in 2010. The authors show how differing airline business models emerged as some airlines rushed to product unbundling while others chose not to. In literature, unbundled product pricing is also called *à la carte*, individual sale, add-on pricing or debundled pricing (Wu et al. 2008; Nason 2009; Geng and Shulman 2015). Discussion in Nason (2009) suggests airlines unbundle products: (1) to capture additional revenue from the differing services needed across customers; and, (2) to not be outpriced by competitors, where customers form their purchase decisions on the base airfare. Therefore, it is



difficult for an airline with bundled base airfares to compete with base airfares that do not include ancillary services.

Literature also shows that product unbundling can lead to operational improvements for airlines. With the introduction of new baggage fees, customers checked fewer bags, instead opting for carry-on luggage (which was free to carry onto the plane). There were concerns that increased carry-on luggage would lead to longer boarding times and more delayed flights. However, the literature found that this was not the case, where on-time departure performance improved with reduced average departure delays (Nicolae et al. 2017) and reduced overall percentage of delayed flights (Scotti et al. 2016). As an added benefit to airlines, the fees allowed for decreased labor costs for handling checked bags (Nicolae et al. 2017) and mishandled baggage rates also improved (Scotti et al. 2016). However, Yazdi et al. (2017) show that improvements in on-time departure performance from baggage fees depend on route-level characteristics, where improvements are lower for leisure markets or routes including a hub-airport. Overall, unbundling of checked baggage was found to be beneficial to airlines. As another example of ancillary fees impacting customer behavior, Chiew et al. (2017) use a proprietary dataset of employee travel and find that exchanges and refunds were reduced by 3.3% when customers had to pay a fee, which in turn impacts airlines' overbooking strategies.

## Dynamic pricing

Another revenue management strategy is dynamic pricing. The exact definition of dynamic pricing is debated in the literature (Wittman and Belobaba 2019). For the purposes of this study, we follow the definition in Wittman and Belobaba (2018) where "firms practice *dynamic pricing* when they charge different customers different prices for the same set of products, as a function of an observable state of nature," which results in a more-robust, revenue-generating, optimal pricing of products. For example, using this definition, advance purchase pricing is a form of dynamic pricing (Wittman and Belobaba 2018), where customers purchasing an airfare or ancillary service further in advance of the departure date pay a lower fee. Dynamic pricing has the benefit of providing a more optimal solution than static pricing for airlines, which increases revenue (Wittman and Belobaba 2018). Additionally, dynamic pricing practices account for the surplus or shortage of current seat inventory (Tunuguntla et al. 2019), which in the airline industry is especially important as it sells a perishable good.

During the early stages of the product unbundling trend, ancillary fees were not implemented with the same dynamic pricing structure as airfares. Ticket prices vary by characteristics such as flight departure day of week, the number of days left until flight departure (also called advanced

booking), and observed passenger demand. However, ancillary pricing complexity was hindered by existing airline information systems, and initial fee structures for ancillaries were relatively simple, static fees (Garrow et al. 2012). As such, literature has shown that dynamically priced ancillary fees could increase airline revenue. For example, airlines could increase seat reservation fee revenues by dynamically pricing seats, such as increasing seat prices as a flight departure date approaches or varying prices based on a seat's location on the plane (Mumbower et al. 2015; Rouncivell et al. 2018; Shao et al. 2020). Also, Shaban et al. (2019) propose a model of dynamically priced extra-baggage services that accounts for utilization-level of the cargo belly.

Opportunities also exist for airlines to increase revenues by optimally pricing products based on customers' willingness to pay. Customers have been shown to differ in their willingness to pay for ancillary products depending on flight and customer characteristics (Espino et al. 2008; Warnock-Smith et al. 2017; Song and Lee 2020; Chiambaretto 2021). For example, customers who check bags for a fee are less sensitive to price, itinerary time and number of connections than other customers (Nicolae et al. 2016). Understanding customer willingness to pay remains a highly relevant task for airlines, especially since their revenue management systems have been impacted by the volatility of the current ongoing COVID-19 pandemic (Garrow and Lurkin 2021).

To synchronize dynamic price offerings with customer willingness to pay, literature indicates that dynamic pricing is moving towards dynamic personalized pricing, where ancillary fees vary by passenger-level characteristics such as frequent flier membership level or the number of passengers flying together in a group (for a review, see Buyruk and Güner 2021). Shukla et al. (2019) build dynamic personalized pricing recommendation models for ancillaries that are specific to each customer. Kolbeinsson et al. (2021) implement those models on the booking system of a European airline; initial testing finds the system increases ancillary revenues by 25% per offer. In ongoing research, Ratliff et al. (2021) are building a system that can implement personalized dynamic pricing of ancillaries in real-time using machine learning. In another work-in-progress, Kumar (2021) is working to dynamically price ancillaries that incorporate trip and customer features using a contextual bandit model. There is also a growing area of literature on personalization of itinerary offerings. One example includes dynamic product bundling, where optimal custom product bundles are offered to customers and dynamically priced. These bundles include a combination of à la carte and bundled flight and ancillary services (Madireddy et al. 2017; Vinod et al. 2018; Wang et al. 2021).

While dynamic pricing has the potential to increase airline revenues, in practice it is difficult to obtain the true optimal pricing solution, especially when the industry has



a mixture of dynamically priced bundled and unbundled products (Fiig et al. 2016, 2018). Even so, many experts believe that customer-centric retailing is the way of the future for the airline industry, where personalized dynamic offers are given in real-time as customers shop (McKinsey & Company 2019). Currently, technology is a major hurdle in its implementation, as the industry still relies heavily on legacy systems incapable of customizing offers (see Daft et al. 2021 for history and discussion of this challenge). Technology challenges are further complicated by the fact that flight schedules and prices are distributed in a multi-channel environment that includes direct channels (airlines' own computer reservation systems) and indirect channels, including the various travel agencies who get their flight and pricing information from global distribution systems (GDSs) such as Amadeus, Sabre, and Travelport (Dezelak and Ratliff 2018). For more information about GDSs, see Smith et al. (2001), Isler and D'Souza (2009), Granados et al. (2012), and Varella et al. (2017). However, recent advances in technology are driving change, such as IATA's New Distribution Capability (NDC), which is capable of personalized offers and dynamic pricing across all distribution channels (IATA 2019; Touraine 2021). Daft et al. (2021) provide an implementation guide for airlines and framework for dynamic offers that incorporates dynamic bundling, continuous pricing, and dynamic assortment optimization. Schubert et al. (2021) provide a conceptual architecture for customized real-time airline offer management capable of granular customer segmentation. However, Shao and Kauermann (2020) recommend that airlines invest in better understanding customer price elasticity before investing in a system capable of dynamic pricing for ancillaries. Additional hurdles in successful implementation include the fairness perception of customers and data privacy concerns (Krämer et al. 2018; Daft et al. 2021).

### Customer reception and purchase behavior

Literature contains studies that have investigated the uptake of various ancillary services and customer feelings towards them. O'Connell and Warnock-Smith (2013) find fees for checked baggage to be one of the most accepted ancillary fees and conclude that "travelers are now starting to accept this as something of a reality that is here to stay." In a conflicting study, however, Tuzovic et al. (2014) survey U.S. leisure passengers and find that customers feel most betrayed by new fees for baggage, followed by charges for comfort (such as extra legroom). While the stated-preference results described a general negative customer reaction, studies on revealed-preference ticket purchase information shows otherwise. Cho and Dresner (2018) find that baggage fees do not impact customer choice of airline based on a study of passengers departing from airports in

the Washington-Baltimore metropolitan region. Scotti and Dresner (2015) show that passenger demand is more sensitive to increases in base fares over baggage fees.

Additional customer purchase behavior findings include that customer choice of premium seats with extra legroom are impacted by load factor, as customers are more likely to purchase premium seats when the free window and aisle seats are all full (Mumbower et al. 2015). Customers value window seats, aisle seats, and seats in the front of the plane the most and will pay to avoid sitting in a middle seat (Mumbower et al. 2015; Rouncivell et al. 2018; Shao et al. 2020). Customers also value extra legroom more on long-haul routes than on shorter routes (Mumbower et al. 2015). On long-haul routes, extra legroom seats that are part of a premium economy class can be a large revenue generator for airlines, as they generate the highest marginal returns out of all other classes, including first, business and economy (Hugon-Duprat and O'Connell 2015).

To summarize, airline ancillary products, pricing, and customer reactions are widely researched areas. Much of the literature focuses on one type of ancillary product or focuses on one point in time. Our paper is the first to use a 16-year time horizon (2005–2021) to show the evolution of unbundled flight products and pricing since their introduction, along with their corresponding impact on airline revenues and government policies. We also compare unbundled flight products for airlines with differing business models (network, low-cost and ultra-low cost carriers) and show how the COVID-19 pandemic has brought about change. In doing so, we provide insights into factors driving current trends in ancillaries and how they may evolve into the future.

### Data and methodology

Our analysis includes ancillary products, fees, and revenues for unbundled flight services. We focus on fees for baggage, ticket exchange, and seat reservation, as they are the largest sources of revenue from unbundled flight products. We note that airlines worldwide have added a plethora of ancillary products and fees. Other sources of ancillary revenues include sales of commission-based products, such as travel insurance or hotel reservations, and revenues from frequent flyer programs, such as the sale of frequent flier miles to bank partners (e.g., see Sorensen and Lucas 2012; O'Connell and Warnock-Smith 2013). These sources of ancillary revenues are excluded from our analysis, as our focus is product unbundling.

Our study includes U.S. airlines that reported at least \$1 billion in annual revenues in 2019, which includes four network carriers (Alaska, American, Delta, and United), two LCCs (JetBlue and Southwest) and two ultra low-cost carriers (ULCCs) (Frontier and Spirit) (BTS 2020d). ULCCs



differ from LCCs where they are smaller airlines in terms of total revenue, have lower unit costs, and rely more on ancillary revenues (Bachwich and Wittman 2017).

Several sources of data are collected and analyzed in this study. For our first research question, we construct tables that incorporate ancillary product and fee information by airline for two points in time: 2010 and 2021. This allows us to compare airlines and assess how they have changed their pricing strategies. We use a combination of airline websites and literature as sources of data. Specifically, the data for 2010 were collected primarily from published studies and supplemented with information from media accounts when necessary. We also rely heavily on data reported in Garrow et al. (2012), who collected 2010 information for all airlines in this study with the exception of Spirit Airlines. Information sources for Spirit in 2010 are noted throughout this paper. For recent ancillary data, we collected fee information from airlines' websites for two time periods: (1) in February 2020 before the COVID-19 pandemic impacted the U.S. airline industry; and, (2) in April 2021 after the airline industry had been impacted by COVID-19. Therefore, we include insight into pre-post COVID-19 effects in the discussions.

Our tables present ancillary product policies and fees that apply to economy class tickets. Some airlines have introduced "basic economy" tickets at lower fares than regular economy class to compete with the low fares of the ULCCs. Basic economy generally prohibits ticket exchange or cancellation, does not allow seat selection, and may not allow a free carry-on bag (e.g., see Yamanouchi 2018). In 2010, none of the airlines in this study offered this fare class. As of 2021, all network airlines in this study, along with LCC JetBlue, have added a basic economy class. We incorporate basic economy throughout our discussions, but not in the tables. Adding this information for all ticket classes would make the tables unwieldy.

For our second research question, we use data from the Bureau of Transportation Statistics (BTS) Schedule P-1.2 (BTS 2020d) to assess airline revenue trends. All airlines in this study report their revenues to BTS, and that data are publicly available. Schedule P-1.2 was used to calculate annual revenues by airline for 2005–2020. We calculate total operating revenues, cancellations and exchange fee revenues, and baggage fee revenues. However, a limitation of the BTS data is that airlines do not report seat reservation fee revenue as a separate line item. As a secondary data source, we identified two airlines who provided enough details in their annual investor reports where seat reservation fee revenues over time could be calculated (JetBlue 2021; Spirit 2021).

## Results and discussion

### Airline ancillary fee structure analysis

This section provides an overview of how airline fees for unbundled flight products have evolved. The results are first provided for baggage and pet fees, then for ticket exchange fees, followed by seat reservation fees.

#### Baggage and pet fees

Airlines implemented new fees for first and second checked baggage in mid- to late-2008 (Cho and Dresner 2018, Table 1) and those fees remained in flux as airlines adjusted their initial pricing and policies. Table 1 provides a snapshot of baggage and pet fees in 2010 and 2021 for each airline in this study. Numbers in parentheses represent lower prices that customers can pay by purchasing in advance, such as at online booking rather than at the airport. All fees reported are for one-way, economy class domestic travel assuming no frequent flyer status or flight bundles that may reduce prices. Most baggage fees have not been impacted by the COVID-19 pandemic and, therefore, are not reported in the table. The only major difference is that ULCCs have used the COVID-19 event to shift from static baggage prices to dynamic.

Looking at checked baggage in 2010, three of the four network carriers (Delta, American, United) strategically aligned their checked baggage fees and all charged \$25 for the first bag and \$35 for the second bag, with 3rd to 10th bag fees in the range of \$100–\$200. During a time when customers were expressing discontent with the new baggage fees (McCartney 2008), aligning their fees meant that no one network carrier stuck out as being more expensive. Currently, the network carriers are still mostly aligned, with Alaska, American, and Delta charging \$30 and \$40 for first and second checked bags and United charging only \$5 more per bag.

More pricing variability, however, can be seen across the LCCs. In 2010, Southwest was the only airline that did not add fees for first and second checked bags. Southwest has continued its policy of not charging for bags, even as all other carriers charged for this service. Alternatively, JetBlue in 2010 did not charge for the first checked bag but charged \$30 for the second checked bag. As of 2021, JetBlue has replaced their free first checked bag policy with a fee structure that aligns with the network carrier fees.

While carry-on baggage has always been free for network carriers and LCCs, this is not true of the ULCCs. In 2010, Spirit introduced a \$45 fee for carry-on baggage. Spirit's introduction of the new carry-on fee was controversial and caused "congressional and public outcry" (U.S. GAO 2010).



**Table 1** Baggage and pet fees, by airline

		Carry-on	1st	2nd	3rd	4th- 5th	6th- 10th	On-board pet	Checked pet
Network carriers									
Alaska	2010	\$0 <sup>a</sup>	\$15	\$25	\$50	\$100	\$100	\$100	\$100
	2021	\$0	\$30	\$40	\$100	\$100	\$100	\$100	\$100
American	2010	\$0 <sup>a</sup>	\$25	\$35	\$100	\$100	\$200	\$100	\$150
	2021	\$0	\$30	\$40	\$150	\$200	\$200	\$125	\$200 <sup>s</sup>
Delta	2010	\$0 <sup>a</sup>	\$25 (\$23)	\$35 (\$32)	\$125	\$200	\$200	\$125	\$200
	2021	\$0	\$30	\$40	\$150	\$200	\$200	\$125	\$245 <sup>**</sup>
United	2010	\$0 <sup>a</sup>	\$25 (\$23)	\$35 (\$32)	\$100	\$100	\$200	\$150	\$250
	2021	\$0	\$35 (\$30)	\$45 (\$40)	\$150	\$150	\$150	\$125	\$328 <sup>s,**</sup>
Low-cost carriers (LCC)									
Southwest	2010	\$0 <sup>a</sup>	\$0	\$0	\$50	\$50	\$50	\$75	N/A
	2021	\$0	\$0	\$0	\$75	\$75	\$75	\$95	N/A
JetBlue	2010	\$0 <sup>a</sup>	\$0	\$30	\$75	\$75	\$75	\$100	N/A
	2021	\$0	\$35 (\$30)	\$45 (\$40)	\$150	\$150	\$150	\$125	N/A
Ultra low-cost carriers (ULCC)									
Frontier	2010	\$0 <sup>a</sup>	\$20	\$30	\$50	\$50	\$50	\$75	\$150
	2021	\$60 (\$36)*	\$60 (\$36)*	\$55 (\$48)*	\$95 (\$83)*	\$95 (\$83)*	\$95 (\$83)*	\$99	N/A
Spirit	2010	\$45 (\$30) <sup>a</sup>	\$25 (\$19) <sup>b</sup>	\$25 <sup>b</sup>	\$100 <sup>b</sup>	\$100 <sup>b</sup>	N/A <sup>b</sup>	\$100 <sup>b</sup>	N/A <sup>c</sup>
	2021	\$67 (\$39)*	\$67 (\$34) <sup>*</sup>	\$60 (\$44)*	\$100 (\$87)*	\$100 (\$87)*	N/A	\$110	N/A

Prices represent airport check-in fees for economy class, assuming one-way domestic travel. (\$) = Lowest price available for online or early booking of baggage service, if applicable. N/A = service is not available. <sup>s</sup>Service was still suspended temporarily due to COVID-19 as of the time of data collection; fees are reported using pre-suspension prices

\*Baggage fees vary due to dynamic pricing: Los Angeles, California (LAX) to Boston, Massachusetts (BOS) was used for a flight booked two months in advance

\*\*Checked pet fees vary due to dynamic pricing: LAX to BOS was used for a small 20–30 lb. dog traveling in the smallest crate available

Sources Data for 2010 pulled from Garrow et al. (2012), except as indicated: <sup>a</sup>Ellis (2010), <sup>b</sup>U.S. GAO (2010), <sup>c</sup>Smarter Travel (2012). Data for 2021 collected from airline websites

At the time, Spirit was the only airline charging the carry-on fee and it is interesting that the fee has now increased. As of 2021, Frontier has aligned their policy for carry-on baggage with that of Spirit. These ULCCs are still the only airlines charging for carry-on baggage.

In 2010, ULCCs Frontier and Spirit added new fees for first and second bags but kept their fees at or below the average fees of the network carriers. Currently in 2021, both ULCC airlines have increased their first and second checked bag fees where they are significantly higher than the network carriers' fees charged. This shows a shift in ULCC business model over time, where ULCCs now draw in customers by offering low base airfares, only for customers to pay more in add-on fees later. In addition to raising baggage fees, both ULCCs have moved from static baggage fees in 2010 to dynamic fees in 2021. The change to dynamic pricing occurred during the COVID-19 pandemic. The fees differ based on market, flight departure date, flight time of day and at what stage a baggage fee is paid (e.g., at booking, during online check-in, at the ticket counter, at the gate). Only after a customer uses a baggage calculator on the airlines' websites can they quantify the fee. The lowest fees are at

booking and most expensive at the gate. This provides an incentive for customers to purchase baggage early, but at a time when their exact needs on the departure date are not well-known.

Variations of baggage fees are not shown in the table but worth noting to demonstrate the added complexity of fees over time. United introduced a baggage subscription service in 2013 that is still in place and allows unlimited free checked bags after paying an annual fee (Maynard 2013). Frontier has two products that bundle ancillaries with the base price of a ticket, called "the WORKS" and "the PERKS" bundles. These allow passengers to pay one fee that includes add-ons. Additionally, during 2012–2019, all network airlines in this study and LCC JetBlue introduced the previously discussed "basic economy" fare class (Yamanouchi 2012). Basic economy class is less expensive than regular economy class, but it comes with restrictions that customers must take into account. Currently, JetBlue and United do not allow basic economy customers to travel with carry-on baggage but make exceptions for some routes; Alaska, American and Delta do not restrict carry-on baggage. Otherwise, basic economy baggage policies



for these airlines are the same as for the regular economy class tickets that are presented in the table. Lastly, many airlines also have co-branded credit cards that are attached to their frequent flier programs and have done so since the 1980s (Reales and O'Connell 2017). The implementation of new baggage fees provided airlines with an opportunity to introduce additional perks for their co-branded credit cards. For example, the Delta SkyMiles American Express Card allows customers (and other passengers on the same reservation) to check their first bag for free.

Table 1 also shows fees for on-board (in-cabin) and checked pets. The most interesting aspect is that checked pet fees for two airlines (Delta and United) have moved from a static fee in 2010 to a fee that varies. For example, when traveling with Delta, passengers can book a pet up to two weeks in advance of the flight on a system called "Delta Cargo". The booking process requires information about origin and destination, departure date, type of animal, breed, age, and crate type before a price is given. We found that only the crate size changes the quoted price. All other required elements appear to check for availability of service, where, for example, certain breeds cannot fly. Interestingly, Delta also offers two different products for

pets on flights: "Variation Live," which is a less expensive economy service with no frills, and "CAREPOD," which costs more and includes a smart crate with active GPS tracking. This demonstrates that product differentiation is being implemented even for services like traveling with a pet.

### Ticket exchange fees

Ticket exchange fees are one of the oldest and most established ancillary fees. When the product unbundling trend began in 2008, ticket exchange fees already existed for most airlines. Table 2 provides a snapshot of domestic exchange fees in 2010 and 2021. In 2010, three network carriers American, Delta, and United aligned their exchange fees and charged \$150 while Alaska charged \$100 (or \$75 for an online exchange). LCC JetBlue and ULCCs Frontier and Spirit all charged fees for ticket exchanges in the range of \$70-\$100. For all airlines that charged exchange fees, customers also must pay the difference in airfares between the original and new ticket when they exchange tickets. Southwest took a different strategy than the others by not charging

**Table 2** Domestic exchange fee structure, by airline

		Domestic exchange fee	Notes
Network carriers			
Alaska	2010	\$100 (\$75)	
	2021	\$0	\$125 fee was dropped; announced on 9/1/2020
American	2010	\$150	
	2021	\$0	\$200 fee was dropped; announced on 8/31/2020
Delta	2010	\$150	
	2021	\$0	\$200 fee was dropped; announced on 8/31/2020
United	2010	\$150	
	2021	\$0	\$200 fee was dropped; announced on 8/30/2020
Low-cost carriers (LCC)			
JetBlue	2010	\$100	
	2021	\$0	\$200 fee was dropped; announced on 4/1/2021
Southwest	2010	\$0	
	2021	\$0	
Ultra low-cost carriers (ULCC)			
Frontier	2010	\$100	
	2021	\$59 (\$0-\$39)*	
Spirit	2010	\$70 <sup>a</sup>	
	2021	\$100 (\$90)	

Prices represent fees for ticket exchange for economy class travel. The "Notes" column indicates whether fee has been recently eliminated, along with the date of the announcement of that policy (where a dollar amount is provided, it is the fee immediately before it was dropped). (\$) = Discounted price available for online and/or earlier exchange

\*Fees vary based on how far in advance the exchange is made: \$59 for ticket exchange 6 or less days before departure, \$39 for 7–59 days, and free for 60 or more days

Sources Data for 2010 pulled from Garrow et al. (2012), except as indicated: <sup>a</sup>Smarter Travel (2010). Data for 2021 collected from airline websites



an exchange fee; instead the airline only charged the difference in airfares.

Table 2 shows the exchange fees as of 2021, where Southwest has continued their policy of not charging for exchange fees. However, all of the network carriers and JetBlue have made significant changes by dropping their exchange fees and now customers only pay the difference in airfares. During the beginning of the COVID-19 pandemic, airlines temporarily waived their exchange fees and allowed passengers to rebook within 12 months of the original trip. Later, United was the first airline to announce (on August 30, 2020) that they would permanently drop their \$200 exchange fee. The other network carriers quickly followed. However, airlines that removed these fees permanently only did so for the regular economy tickets, and not for basic economy tickets. Currently all airlines that have a basic economy class do not allow ticket exchanges for that class, even for a fee, except for JetBlue who allows exchanges for \$100-\$200 depending on the route. Before the pandemic began, Delta had already announced that they were planning to overhaul their ticket exchange policies (Delta 2020). Frontier and Spirit still have exchange fees and have not announced plans to eliminate them.

One of the more interesting aspects seen in the table is that Frontier has shifted from static prices to dynamic prices that vary by how far in advance an exchange is made. If

customers make the exchange far enough in advance (over 60 days) they pay no fee.

### Seat reservation fees

As part of the rapid product unbundling trend, airlines also implemented new seat reservation strategies. Airlines used different strategies for creating unique seat products that could be sold for an additional fee, including “extra legroom” and/or “preferred” seats. Extra legroom seats are usually part of a premium economy class ticket that airlines brand as economy plus or comfort economy. These seats are often located near the front of the plane or in the emergency exit rows and come with early boarding privileges. On the other hand, “preferred seats” are seats in regular economy class that usually do not have extra legroom but are located in popular parts of the plane (such as a window or aisle seat, or near the front of the plane).

Table 3 shows the airlines’ seat reservation strategies for 2010 as compared to 2021. The table indicates in the “seats for sale” column whether airlines had seats in their regular economy class that required a fee for their reservation. If “Yes”, this means that some seats required a fee for their reservation. It does not mean that all seats required a fee (some seats may have been free to reserve). The remaining columns indicate whether the airline had extra legroom and/or preferred seats available to passengers.

**Table 3** Seat reservation fee structure, by airline

			Seats for sale?	Extra legroom seats?	Have preferred seats? (indicates seat access requirements)
Network carriers					
Alaska	2010	No	No	Yes (elites)	
	2021	Yes	Yes	Yes (elites)	
American	2010	No	No	Yes (elites)	
	2021	Yes	Yes	Yes (elites; \$ for non-elites at booking)	
Delta	2010	No	No	Yes (elites)	
	2021	Yes	Yes	Yes (elites; \$ for non-elites at booking)	
United	2010	Yes	Yes	Yes (elites; \$ for non-elites at check-in)	
	2021	Yes	Yes	Yes (elites; \$ for non-elites at booking)	
Low-cost carriers (LCCs)					
JetBlue	2010	Yes	Yes	No	
	2021	Yes	Yes	No	
Southwest	2010	Early check-in	No	No	
	2021	Early check-in	No	No	
Ultra low-cost carriers (ULCC)					
Frontier	2010	Yes	Yes	Yes (elites; \$ for non-elites at check-in)	
	2021	Yes	Yes	Yes (elites; \$ for non-elites at booking)	
Spirit	2010 <sup>a</sup>	Yes	Yes	Yes (\$ for all at booking)	
	2021	Yes	Yes	Yes (elites; \$ for non-elites at booking)	

Sources Data for 2010 pulled from Garrow et al. (2012), except as indicated: <sup>a</sup>U.S. GAO (2010), Effron (2010), Hume (2012). Data for 2021 collected from airline websites





For the preferred seats, we indicate in parenthesis which passengers could reserve those seats, as some airlines reserved them only for elite members of their frequent flier programs. We also checked to see if the seat reservation fee policies in this table have been impacted by the ongoing COVID-19 pandemic. The one change due the pandemic is that many airlines temporarily blocked middle seats from being reserved to help facilitate social distancing among passengers.

United was the only network airline in 2010 that was charging a seat selection fee, and they offered both extra legroom and preferred seats. United gave elite members of their frequent flier program access to their preferred seats for free, but all other passengers could purchase preferred seats at check-in for a fee. This seat structure remains for United, but they have opened up their preferred seats so that passengers who are not elites can purchase them during the booking process. The other network carriers took a different strategy in 2010. Alaska, American, and Delta did not have extra legroom seats. They did, however, have preferred seats, but those preferred seats were not for sale. Instead, they were available only to elite members of their frequent flier programs. Currently, as of 2021, Alaska, American, and Delta have all added extra legroom seats. Delta and American have also modified their policies for preferred seats. Elite members can still reserve them for free, but they have opened up access to these seats for non-elites who can pay for a preferred seat during booking.

In 2010, LCC JetBlue and ULLCs Frontier and Spirit had extra legroom seats, but their approaches to preferred seats varied. JetBlue did not have preferred seats. Frontier had preferred seats, allowing elites access for free and opening them up to others for a fee at check-in. Spirit's preferred seats could be reserved for a fee at booking by any customer willing to pay the fee. Looking at changes in policies in 2021, Frontier and Spirit, allow non-elites to access their preferred seats for a fee during booking now. This aligns with the current policies of American, Delta, and United. Southwest has a unique approach to seating and their policies have not changed since 2010. Southwest does not assign advanced seat assignments. Instead, the airline charges a fee for early check-in, allowing customers to board early which improves their chances of selecting the seat they want.

After the introduction of preferred seats, customers expressed frustration with paying for seats that were once free and complained that it became expensive for families to sit together; this caught the attention of media outlets and members of Congress (for a discussion, see Mumbower et al. 2015, Sect. 2.2). Ultimately, airlines did not remove these fees. In fact, airlines have used the basic economy class tickets to restrict seat reservations further. In general, customers who purchase basic economy tickets must wait until check-in for a seat assignment or pay a fee to reserve one in

advance (if allowed). It is interesting to see that most airlines who provide free preferred seats to their elite members have opened them up to non-elites for a fee during the booking process rather than at check-in. This policy shift is likely to make it more difficult for elite members to obtain a free preferred seat. In addition, many airlines have made changes to their frequent flier programs which may also make it harder for customers to get to elite status. Rather than frequent flier programs depending only on mileage flown, requirements have also been added for minimum dollars spent and segments flown too. Knorr (2019) provides a detailed account of this shift in frequent flier programs.

Although Table 3 demonstrates airlines' current seat reservation strategies, it does not show how pricing complexity has grown over time. Using American Airlines as an example, the current seat pricing for their preferred seats (without extra legroom) depends on both the flight departure time of day and the seat location on the plane. For example, a customer flying between New York City (JFK) and Los Angeles, California (LAX) for a flight departing on Thursday, March 18, 2021 at 9:00 am will pay a fee of \$43 for an aisle/window seat and \$39 for a middle seat. Alternatively, a customer booking a flight for a 6:30 pm departure on the same day will pay a fee of \$32 for an aisle/window seat and \$29 for a middle seat. Oddly enough, preferred seats are not present on all aircraft used in this market on this date. A flight for a 12:00 pm departure uses an aircraft configuration with no preferred seating available. An American Airlines customer can view an airplane seat map during the booking process that will show seat availability. However, seat prices are not displayed until after the customer chooses a flight departure time and enters their name, address, date of birth, gender, phone number, and email address. This barrier makes it difficult to compare prices (base airfare plus preferred seat price) across flights and demonstrates how airlines' ancillary policies can decrease pricing transparency for customers, making price shopping more time consuming. Diminished pricing transparency has long been a concern of the U.S. Department of Transportation (DOT) and this topic will be explored next.

### Discussion of pricing transparency and customer protections

In response to the rapid product unbundling trend, customers and media expressed frustration with the decrease in pricing transparency (e.g., see McCartney 2008; Hume 2012) and customers reported being "surprised" by ancillary fees later at the airport (Federal Register 2011a). This drew the attention of policymakers. Starting in 2008, the U.S. DOT rolled out a series of notices, calls for comments, and rulings aimed at increasing airline passenger protections related to ancillary services (Federal Register 2008, 2010, 2011a). A



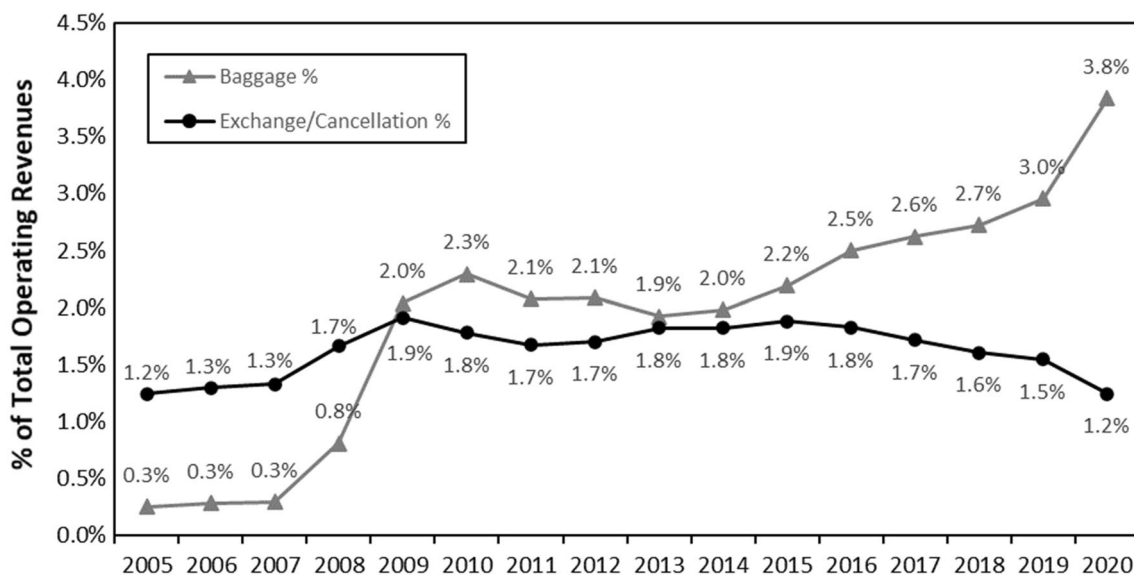
*Final Rule* (Federal Register 2011a) required that airlines clearly display all ancillary fees to customers early during the booking process on their websites. However, the new regulations did not require the same for travel agents who display or sell air travel (e.g., online travel agents and brick-and-mortar travel agents). Travel agents generally get fare and schedule information from GDSs. The GDSs get their information directly from airlines, but do not have access to real-time information about carriers' ancillary fees. Therefore, the regulations only required that travel agents have a link to airline websites where customers can find fee information themselves.

To address this gap, the DOT issued two *Notices of Proposed Rulemaking* (Federal Register 2014, 2017a) proposing to require that airlines provide ancillary fees information to all ticket agents (including GDSs) who provide their fares and schedules to customers. Since about 50% of customers book air travel through travel agents (Federal Register 2014), the goal was to ensure that all airline customers have clear ancillary fee information at booking, regardless of the booking channel. However, the proposals turned out to be controversial and the public comment period revealed significant tensions between GDS's (who supported the proposal) and carriers (who all opposed the proposal, with the exception of Southwest Airlines). To understand why airlines do not share ancillary fee information with GDSs, the DOT explained that according to airline representatives "GDSs do not have the modern technology airlines need to merchandise and sell their products the way they choose. The GDSs disagree with the airlines' assessment and contend that they are capable

of handling the most complex airline transactions" (Federal Register 2014). This issue was never resolved, and the proposals were withdrawn without receiving a final ruling (Federal Register 2017b; U.S. DOT 2017).

It is likely that these proposed regulations will be revisited in the future, especially as airlines move towards more complex pricing schemes. In fact, we have already seen some evidence that ancillary fees and pricing transparency are still points of concern for government representatives and consumer organizations. Letters were written to U.S. Congress in 2020 by four U.S. Senators (Markey 2020) and passenger rights organizations (Travel Fairness Now 2020) requesting enhanced consumer protections around ancillary fees. More recently, an Executive Order was issued on July 9, 2021 which stated that the U.S. DOT should "consider initiating a rulemaking to ensure that consumers have ancillary fee information, including 'baggage fees,' 'change fees,' and 'cancellation fees,' at the time of ticket purchase" (Executive Order 2021).

On the one hand, airline product unbundling and pricing strategies have drawn negative attention from policymakers and consumers. On the other hand, the same strategies have increased airline revenues and helped airlines become profitable again after the difficult financial downturn experienced during the first decade of the twenty-first century. The next section will show how airline ancillary revenues have evolved over time.



**Fig. 1** Baggage and Exchange/cancellation fee revenues as a percentage of total operating revenues

*Note:* Spirit failed to report either type of fee in 2005–2008. Delta did not report exchange/cancellation fees in 2005–2008, and Ameri-

can did not report them in 2005–2007. These airlines are excluded for those years from both trendlines. Sensitivity was checked by also excluding these airlines from all years, and the trends still hold



### Airline ancillary revenue analysis

Figure 1 shows baggage fees and exchange/cancellation fees as a percentage of operating revenues across all airlines included in this study. With the exception of Southwest, all airlines implemented new baggage fees in 2008. The figure shows revenues increased after their implementation, with baggage fees in 2009 representing 2.0% (\$1.5 B) of airlines' operating revenues. Between 2009 and 2020, the airlines in this study made a combined \$37.9 B in baggage fee revenues. The increase in baggage fees as a percentage of operating revenues in 2020 can be attributed to impacts of the COVID-19 pandemic. Annual operating revenues in 2020 decreased by 62% as compared to 2019, but baggage fees only decreased by 51%.

Southwest is included in Fig. 1, but their baggage revenues are different than the other airlines since they have never charged customers for carry-on, first or second checked baggage. The airline makes revenue from the third through tenth checked bags. However, these revenues are small and have remained flat over time, representing only 0.22% of their total operating revenues in 2005 and 0.38% in 2020.

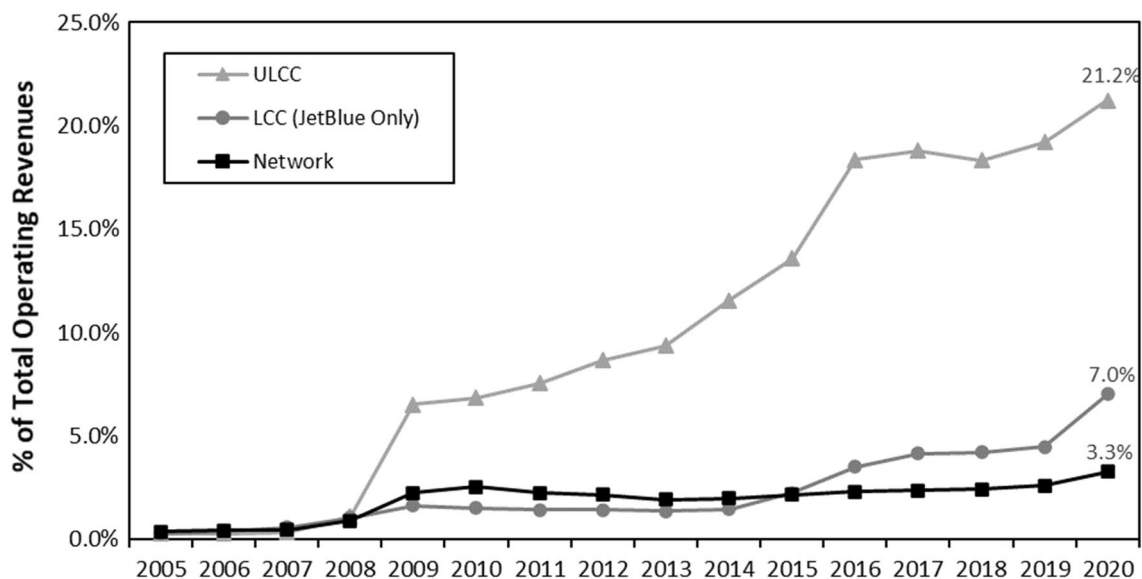
For exchange/cancellation fees, the figure shows an increasing trend between 2005 and 2009. In recent years, revenue from these fees have made up a decreasing portion of total airline operating revenue due to airlines' increased revenues from other sources. Specifically, net revenues from exchange/cancellation fees (not shown) have mostly increased year over year, but have not kept up with the increases in total operating revenues. This figure does not

include the additional revenue airlines made due to charging the airfare difference between the original and new ticket, as this is not captured in the BTS data.

To compare airline business models, Fig. 2 shows baggage fees as a percentage of operating revenues by network carriers, LCCs and ULCCs. The chart only includes airlines that implemented new baggage fees as part of the product unbundling trend (i.e., excludes Southwest). Baggage fees are a much larger revenue source for ULCCs than for other carriers, with baggage fee revenues making up 21.2% of their total operating revenues in 2020 as compared to 7.0% for LCC JetBlue and 3.3% for the network carriers.

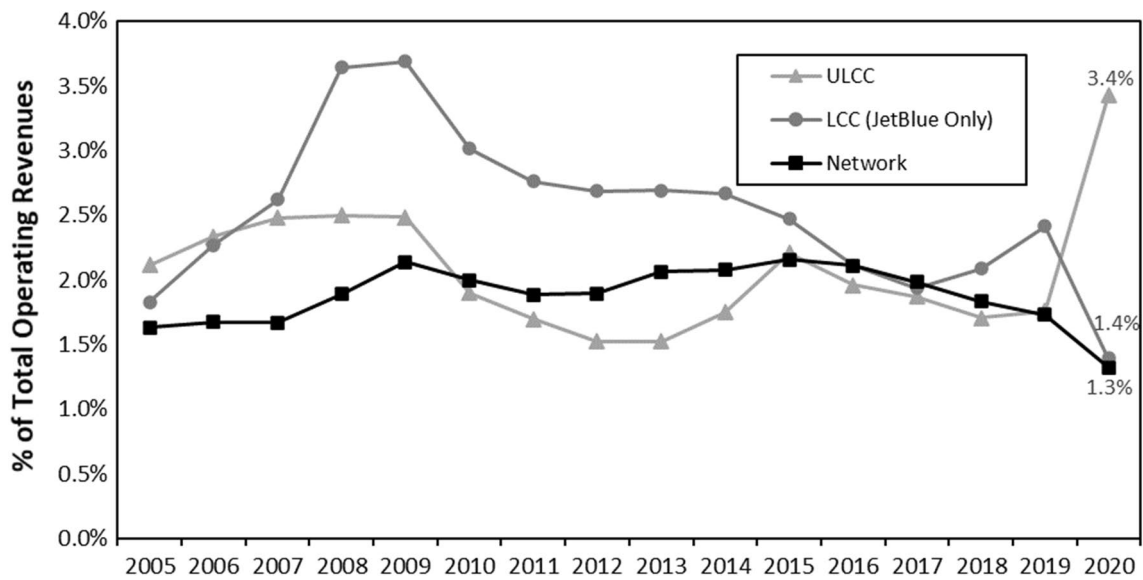
Figure 3 shows exchange/cancellation fees as a percentage of operating revenues by carrier type. The chart only includes airlines that have had exchange/cancellation fees (i.e., excludes Southwest). Exchange/cancellation fees are a larger revenue source for JetBlue than for network carriers or ULCCs. Looking at 2019, the last year before the pandemic impacted the airlines, these fee revenues represented 2.4% of JetBlue's total operating revenues as compared to 1.8% for the ULCCs and 1.7% for the network carriers. This may reveal why JetBlue was slower to announce that they would permanently drop these fees, with the airline announcing their discontinuation seven months after United first made their announcement.

The large increase that is observed in 2020 for the ULCCs (from 1.8 to 3.4%) is due to Frontier's policies during COVID-19. Due to the pandemic, most airlines in this study that collect exchange/cancellation fees had a significant decrease in revenues for these fees in 2020 compared to 2019 (a decrease of 66% to 79% across the airlines).



**Fig. 2** Baggage fee revenues as a percentage of total operating revenues by airline type  
*Note:* Spirit did not report in 2005–2008 and is excluded for those years. Southwest is excluded from all years



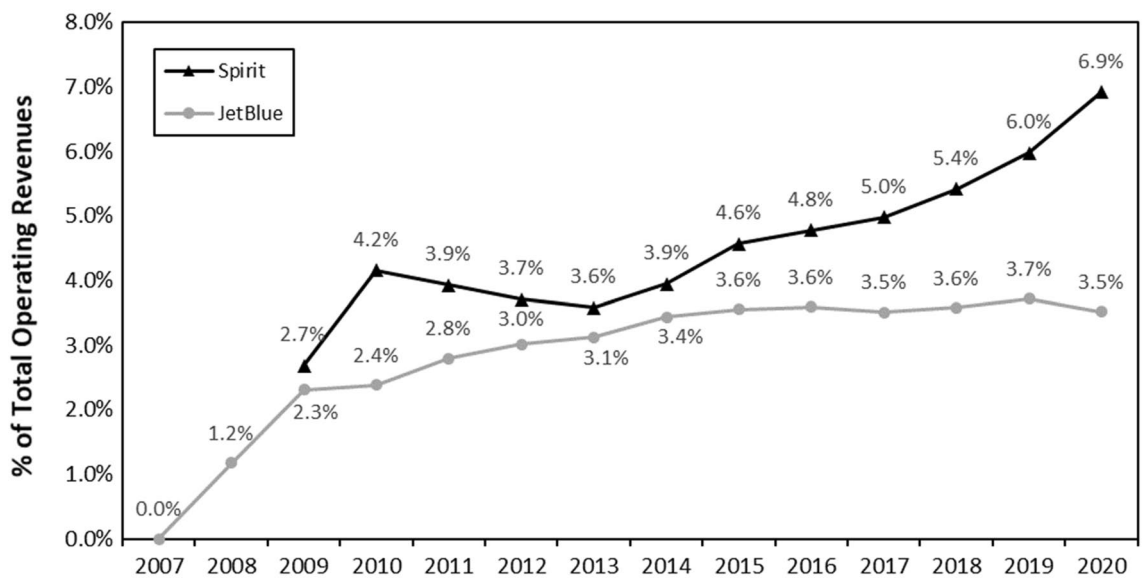


**Fig. 3** Exchange/cancellation fee revenues as a percentage of total operating revenues by airline type  
*Note:* Spirit and Delta did not report in 2005–2008, and American did not report in 2005–2007. These airlines are excluded for those years. Southwest is excluded from all years

However, Frontier had a 78% increase in exchange/cancellation fee revenues during that time. This was mainly due to quarter one of 2020, where Frontier had a 252% increase in these revenues compared to the same quarter the previous year. It was reported in media accounts that Frontier continued to charge cancellation fees during the first few weeks of the pandemic, even as the airline had said they would waive the fees. A Frontier spokesperson called it a “communications disconnect” (Passy 2020), but based

on the BTS data, it appears that the airline still collected significant revenues from these fees during the first weeks of the pandemic.

For seat reservation fees, all carriers, excluding Southwest, have now added extra legroom seats to their coach cabin. Unlike revenues from baggage fees and exchange/cancellation fees, airlines are not required to report seat reservation fee revenues as a separate line item to BTS, so it is impossible to look at revenue trends for these fees



**Fig. 4** Seat reservation fee revenues as a percentage of total operating revenues



overtime using the government data. However, two airlines in our study (JetBlue and Spirit) routinely report seat reservation fee revenues as part of their annual reports for investors.

Using revenues from the annual reports for investors (JetBlue 2021; Spirit 2021), we show in Fig. 4 annual revenues from seat reservation fees as a percentage of their total operating revenue. JetBlue introduced extra legroom seats in mid-2008, and these revenues accounted for 2.3% of their total operating revenues by 2009. On the surface, that percentage may not seem very large. However, the importance of their extra legroom seat reservation fee revenues can be better put into perspective by noting that the airline's net profit in 2009 was only \$58 M, and their seat reservation fee revenues alone were \$76 M. These revenues supported airline profitability in the tough years following the Great Recession, and the airline noted in their 2009 report that revenues from ancillaries helped to "offset industry-wide fare weakness" (JetBlue 2021). Moreover, seat reservation fees revenues for JetBlue total \$2.2 B since their introduction in mid-2008. In 2019, these revenues accounted for 3.7% of total operating revenues and \$301 M.

Similar to JetBlue, Fig. 4 shows an increase over time in Spirit's annual revenues from seat reservation fees as a percentage of their total operating revenue. Spirit has both extra legroom seats and preferred seating without extra legroom, and those seat reservation fee revenues in 2009 were 2.7% of the airline's total operating revenues. The annual investor report for 2009 is the oldest report available for the airline. As of 2019 these revenues accounted for 6.0% of total operating revenues and \$229 M. During the COVID-19 pandemic in 2020, Spirit experienced an uptick to 6.9%. This is due to annual operating revenues in 2020 decreasing by 53% compared to 2019, but seat reservation fees only decreasing by 45%.

Looking at the ancillary revenue trends presented in this section, it is apparent that airlines have increased their reliance on revenues from baggage and seat reservation fees. On the other hand, revenues from exchange/cancellation fees in recent years made up a decreasing portion of total airline operating revenues. As airlines shift their revenue streams over time, it impacts government funding sources, which is discussed next.

### Discussion of U.S. Airport and Airways Trust Fund impacts

The Airport and Airway Trust Fund (AATF) is an important source of funding for the air transportation system in the U.S. and is funded primarily by excise taxes paid by users (FAA 2021a). It taxes passenger transport, air cargo, and aviation fuel (FAA 2021b). Passenger transport taxes represent the largest source of tax revenue for the AATF (FAA 2021a). Domestic passenger tickets and revenues from

ticket exchange and cancellation fees are subject to a 7.5% excise tax (FAA 2021b). However, many other ancillary services are not subject to excise taxes and do not contribute to the AATF, including fees for checked baggage, pet transport, seat reservations, early boarding, ticket reservation by phone, blankets/pillows and food (U.S. GAO 2010, Table 1). As airlines change their policies and shift their revenue streams over time, the AATF can be impacted.

As previously discussed, many airlines have announced the permanent discontinuation of exchange fees, a move that could decrease AATF revenues since exchange fees are taxed. In 2019, revenues from exchange and cancellations fees (across all airlines in this study) were \$2.8 B. Since these revenues are taxed at 7.5%, revenues from these fees contributed \$211 M towards the AATF. To put this into context, the AATF's total revenues from excise taxes in the same year were reported to be \$15.991 B (FAA 2020), meaning that taxes from exchange and cancellations fees represented 1.32% of the total AATF revenues. It is not possible to separate the revenues for exchanges versus cancellations because they are not reported separately.

Looking at sources of revenue that are currently untaxed, revenues from baggage fees across all airlines in this study were reported to be \$5.4 B in 2018. If baggage fees had been subject to the same 7.5% excise tax as tickets, then that would have been an extra \$403 M for the AATF, which translates to an extra 2.5% in revenues (since the AATF's total revenues from excise taxes in the same year were reported to be \$15.991 B). Viewed another way, as airlines have shifted their revenues from taxed to untaxed sources, this has decreased revenues to the AATF.

For seat reservation fee revenues, which are not reported as a separate line item to BTS, we can only make a general estimate of their impact on the AATF. The airlines in this study (excluding Southwest since the airline does not have seat reservation fees) reported a combined total operating revenue of \$159.4 B in 2019. To determine how much of those revenues were collected through seat reservation fees, we use data from annual investor reports for JetBlue and Spirit (JetBlue 2021; Spirit 2021), along with assumptions for the other airlines using what is known about their ancillary fee structures. As shown in Fig. 4, in 2019 JetBlue reported revenues from seat reservation fees that represented 3.7% of the airline's total operating revenues (or \$301 M) and Spirit reported 6.0% (or \$229 M). For Frontier, we assume that their seat reservation fee revenues are similar to Spirit, since they are both ULCCs with similar business models, and make up 6.0% of their \$2.5 B in total operating revenues (or \$151 M). None of the four network carriers in this study, reported seat reservation fee revenues as separate line items in their annual investor reports. However, American Airlines stated that seat fee revenues represent their "second largest ancillary revenue stream after bags"



(American 2019). To put an upper and lower bound on our estimates, we assume that seat fee revenues for the network carriers are less than their baggage fee revenues and greater than their ticket cancellation and exchange revenues. In 2019, baggage fees for the four network carriers were 2.6% of their total operating revenues and ticket cancellation and exchange fees revenues were 1.7%. Total operating revenue for the network carriers was a combined \$144.9 B, so it is estimated that revenues from seat reservation fees are in the range of \$2.5 B to \$3.8 B. To summarize, we estimate that the airlines in this study (excluding Southwest) collected between \$3.2 B and \$4.4 B in seat reservation fees in 2019. If these estimated seat reservation fee revenues had been subject to the same 7.5% excise tax as tickets, then the AATF would have collected an additional \$239 M to \$334 M which represents 1.5% to 2.1% in additional revenues to the fund (the AATF's total revenues from excise taxes in 2019 were \$15.991 B).

In summary, we estimate that revenues from two of the largest sources of ancillary revenues from unbundled flight products, baggage and seat reservation fees, would increase AATF revenues by approximately 4.0% to 4.6% if taxed. This does not consider other sources of ancillary revenues such as pet transport, early boarding, ticket reservation fee by phone, blankets/pillows and food. Even back in 2010, there were concerns about airlines shifting their revenue sources from taxed sources towards untaxed sources (U.S. GAO 2010). There was a Bill introduced in the U.S. Senate in 2010 called the *Airline Baggage Transparency and Accountability Act* that would have amended the Internal Revenue Code so that airline revenues from checked and carry-on baggage would have been taxed at 7.5% (U.S. Congress 2010). However, the Bill did not progress in Congress.

Baggage fees are reported to the government in a straightforward way, but other sources of untaxed ancillary revenues are not, such as revenues from seat reservation fees, pet transport, early boarding, ticket reservation fee by phone, blankets/pillows and food. This makes it difficult to determine exactly how much the product unbundling trend has impacted the AATF. In 2011 the U.S. DOT noticed that “policymakers and regulators lack the necessary detailed data to determine total revenues from airline-imposed fees and the fees’ impact on the industry” and issued a *Notice of Proposed Rulemaking* to update the way that airlines report their revenues to the government (Federal Register 2011b). Rather than lumping their revenues into large categories when reported, the proposal aimed to require airlines to report their revenues in far greater detail, itemizing each type of ancillary service. However, this proposal was withdrawn in 2017 (Federal Register 2017b; U.S. DOT 2017). We believe that these policy issues and taxation laws may be revisited again in the future, especially since the current

COVID-19 pandemic has drastically impacted airline and AATF revenue streams.

## Conclusions

In the past, airline product unbundling and ancillary pricing strategies have drawn negative attention from policymakers and consumers, even prompting the U.S. DOT to pass regulations around pricing transparency. However, these pricing strategies have increased airline revenues and helped airlines become profitable again after a difficult financial downturn. The trend towards more complex pricing strategies could lead to growing concerns in the future about pricing transparency and may prompt the U.S. DOT to look into these policies once again. Similarly, as airlines shift revenues from taxed sources to untaxed sources, it will also be important to address the product unbundling trend’s implications for the U.S. Airport and Airway Trust Fund, as we estimate that this shift has reduced the fund’s revenues by an estimated 4.0–4.6% for untaxed baggage and seat reservation revenues alone. Some organizations have warned that the fund is at-risk of running out of cash in the future unless Congress takes actions (AASHTO 2020).

To increase revenue generation, innovations in revenue and pricing management have led to more complex pricing schemes for ancillaries, including dynamic pricing. We believe that ancillary fees will continue to grow in complexity in the future as the industry shifts towards customer-centric retailing, where customers shopping for air travel will be given personalized dynamic offers in real-time. However, its successful implementation will require that the industry overcome the limitations of its current technology. Airlines have already invested heavily in information systems capable of complex pricing schemes and the uptake of information systems has helped airlines set prices based on customers’ willingness to pay (Button 2019). New technology such as IATA’s NDC has not yet been implemented throughout the whole industry but will someday make dynamic personalized pricing and offers possible across all distribution channels. At the same time, as pricing strategies move to become more personalized, the fairness perception of customers and data privacy concerns will be important issues to consider. Similarly, there are legal issues and ethical concerns that the industry should address going forward (van der Rest et al. 2020). The business goal for customer-centric retailing is not only to improve profitability, but also to increase customer satisfaction by personalizing offers based on customers’ individual needs and preferences (Daft et al. 2021). If implemented carefully, customer-centric retailing could improve the shopping experience for airlines’ customers in the future.



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