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LOW-FARE FLIGHTS ACROSS THE ATLANTIC: IMPACT OF LOW-COST, LONG-HAUL, TRANS-ATLANTIC FLIGHTS ON PASSENGER CHOICE OF CARRIER

By

Jennifer Nicole Hunt

A Dissertation Submitted to the College of Aviation in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Aviation

> Embry-Riddle Aeronautical University Daytona Beach, Florida May 2018

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LOW-FARE FLIGHTS ACROSS THE ATLANTIC: IMPACT OF LOW-COST, LONG-HAUL, TRANS-ATLANTIC FLIGHTS ON PASSENGER CHOICE OF CARRIER

By

Jennifer Nicole Hunt

This Dissertation was prepared under the direction of the candidate's Dissertation Committee Chair, Dr. Dothang Truong, and has been approved by the members of the dissertation committee. It was submitted to the College of Aviation and was accepted in partial fulfillment of the requirements for the Degree of

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ABSTRACT

Researcher: Jennifer Nicole Hunt
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Institution: Embry-Riddle Aeronautical University
Degree: Doctor of Philosophy in Aviation

Year: 2018

Full-service carriers (FSCs) have long ruled the trans-Atlantic market, due to the absence of low fare competition, which has kept airfares high. However, renewed interest in lowcost, long-haul (LCLH) flights was prompted by efficient aircraft, low fuel prices, liberalization of air markets, and low-cost carriers' growth opportunities. Since 2013, multiple LCLH carriers have commenced trans-Atlantic operations, and their market share has grown to 8%. In response, FSCs are establishing their own LCLH subsidiaries and/or introducing basic economy airfares to more effectively compete in the trans-Atlantic market. The purpose of this dissertation was to further the understanding of LCLH and FSC passengers in the trans-Atlantic market by determining what demographics and airline service attributes affected their choice of carrier type, and also what impacted their willingness to switch carrier type and the amount they were willing to pay to do so. A total of 1,412 trans-Atlantic economy and premium economy passengers were surveyed at Los Angeles (LAX) and Seattle–Tacoma (SEA) Airports, which included those who had flown an LCLH (n = 787) or an FSC (n = 625).

Exploratory and confirmatory factor analyses were performed to develop a factor structure for passenger travel experience attributes, which were identified as: Operations, Comfort, Onboarding, Service, and Flight Schedule, along with a variable, Airfare. Binary logistic regression was used to determine the variables/factors that affected passenger choice of LCLH or FSC. Younger passengers preferred LCLH carriers, whereas older passengers preferred FSCs. Airfare was the most important predictor of choice of carrier type, followed by Comfort, Service, and Flight Schedule. Satisfaction with Airfare and Comfort were associated with choice of an LCLH carrier, whereas satisfaction with Service and Flight Schedule were associated with choice of an FSC.

Willingness to switch from an LCLH to an FSC was evaluated, with 55% of respondents indicating they would remain loyal, and 45% of them being willing to switch to an FSC. Decision tree analyses were utilized to show the relationships between variables/factors that were relevant for passenger switching decisions. The variables/factors that affected an LCLH passenger's willingness to switch to an FSC were: Airfare, Income, Education, Age, Gender, Comfort, and Operations. Binary logistic regression was utilized to determine that Age, Education, and Cabin Class affected willingness to pay more to switch to an FSC. Willingness to switch from an FSC to an LCLH was evaluated, with 76% of respondents indicating they would remain loyal, and 24% being willing to switch to an LCLH carrier; with a decision tree showing that Gender, Service, Airfare, and Onboarding affected this decision. Binary logistic regression was utilized to determine that Airfare, Nonstop Flights, and Courtesy and Responsiveness affected willingness to pay less to switch to an LCLH carrier.

This research has demonstrated that often overlooked aspects of air travel, such as comfort and service, are vitally important to long-haul passengers. Furthermore, both LCLH and FSCs have a place in the trans-Atlantic market, as some passengers prefer a *no frills* LCLH offering; whereas other passengers prefer an all-inclusive FSC offering.

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DEDICATION

This dissertation is dedicated to Sonja, who was the first B787 Dreamliner to grace the trans-Atlantic skies for Norwegian Air, setting off a low-cost revolution with airlines eagerly following in her contrails. Working as a Boeing 787 Field Service Rep supporting Sonja and her Dreamliner sisters on both sides of the Atlantic has been an adventure, prompting my fascination with low-cost, long-haul carriers and leading to this dissertation. Thank you Sonja, and best wishes for your continued success.

This dissertation is also dedicated to the trans-Atlantic airline passengers who so generously gave of their time to complete the survey.

ACKNOWLEDGEMENTS

I would like to thank Drs. Haydee Cuevas and Ahmed Abdelghany for serving as my committee members. Dr. Fariba Alamdari, my external committee member, was essential in garnering the necessary support from Boeing. Dr. Dothang Truong, my committee chair, devoted significant time and effort to guiding me through the dissertation process, and I am grateful for all of his help and encouragement. I would also like to thank my academic advisor, Dr. Mark Friend, for his guidance.

Special thanks to my Managers: Brad Angel, Alex Webster, Luis Garcia, and Hiroki Sayama have been incredibly supportive of the pursuit of this degree; and thanks to Boeing for having provided the funding. The loan of iPads to conduct the survey was made possible by John Davies of Boeing IT. I would also like to acknowledge Mitra Rogers, Skip Thompson, Sheila Doane, and Dr. Rachelle Ornan-Stone of Boeing for their assistance. M1nd-set generously provided data to evaluate the generalizability of this research. Los Angeles World Airports and the Port of Seattle granted uncommon access at Los Angeles and Seattle–Tacoma International Airports, and garnered airline cooperation to conduct this this survey.

Hope Demertzis, my aunt, offered invaluable assistance with the editing of the dissertation and provided a wealth of knowledge and support with navigating the Ph.D. process, and was integral to my success. Dorothy Hunt, my mother, spent countless hours at the airport helping with the surveying of passengers. James Hunt, my father, was also very supportive. Special thanks to my cohort classmates Jen Edwards, Karlene Petitt, and Troy Techau for their encouragement. And, of course, thanks to AAirplane.

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CHAPTER I

INTRODUCTION

The purpose of Chapter I was to provide introductory content including the prior history of low-cost, long-haul (LCLH) carriers, what led to renewed interest in LCLH, and a brief description of each trans-Atlantic LCLH carrier. Next, an overview of passenger survey research was provided. And finally, the statement of the problem, its purpose, research questions, significance of the study, delimitations, limitations and assumptions, definition of terms, and list of acronyms were detailed.

Airline Business Models

Since the focus of this dissertation was on passenger choice of airline, a brief distinction will be made amongst airline business models, with further elaboration provided in the Chapter II literature review. Full-service carriers (FSCs) offer a comprehensive network, multiple fleet types, several cabin types (economy, premium economy, business, first class), frequent flier programs, the hauling of air cargo, and they use a hub-and-spoke system (Wensveen, 2011). For long-haul flights, FSCs typically offer economy class travelers an inclusive product with baggage, food and beverage, assigned seating, and in-flight entertainment (IFE) as part of the ticket price (Wensveen & Leick, 2009). Airlines known as low-cost carriers (LCCs) have traditionally operated in short-haul markets, offering a *no-frills* product, with the base airfare solely including a seat on the flight (Wensveen & Leick, 2009). Other typical characteristics of LCCs include fleet commonality, high aircraft utilization, quick turnaround times, high-density configuration, on-board catering for purchase, operations from secondary airports, point-

to-point routes, simplified airfares, lower labor costs, and higher employee productivity (Wensveen & Leick, 2009). LCLH carriers typically operate on point-to-point routes, and have taken the long-haul economy class product and unbundled it to charge an array of fees for items such as baggage, food and beverage, and assigned seating; thus passengers pay for the products and services they use (Daft & Albers, 2012).

Early Attempts at LCLH

Cheap trans-Atlantic flights are not a new concept. The LCLH business model stretches back to 1948, when Icelandic Airlines (Loftleiðir) utilized a DC-4 Skymaster to cross the Atlantic, using the slogan "We are the slowest but the lowest" on a 14-hour journey via Iceland (Reuters, 2015; Rivers, 2015). Laker Airways' Skytrain commenced trans-Atlantic service in 1977 with the DC-10 between New York–John F. Kennedy (JFK) and London–Gatwick Airports, followed by People Express in 1983 with the B747 from Newark to London-Gatwick (Whyte & Lohmann, 2015). Both LCLH attempts failed—Skytrain in 1982, due to lack of a system to handle reservations and yield management, fierce airline rivals, and a recession; and People Express in 1987, since it grew too quickly and had leadership woes (Morrell, 2008). The LCLH business model remained dormant in the trans-Atlantic market for decades. As a result, FSCs operated trans-Atlantic routes that were absent from low-fare competition which could diminish revenue and market share. Embry-Riddle Aeronautical University (ERAU) Professor Alan Bender noted, "Only the lack of serious low-cost competition keeps fares so high" in the trans-Atlantic market (Mutzabaugh, 2016, para. 10). Canadian LCLH carrier Zoom Airlines took flight in 2002 and served multiple destinations from Canada and the

United States (U.S.) to the United Kingdom (U.K.); yet by 2008 it had ceased operations due to the global recession, soaring fuel prices, lack of feeder traffic, and insufficient financing (Whyte & Lohmann, 2015). The litany of failures cast doubt on the feasibility of the LCLH business model, particularly in the competitive trans-Atlantic market. However, recent success in the Asia-Pacific region paved the way, as LCLH carriers AirAsia X, Cebu Pacific, and Jetstar took flight.

Renewed Interest in LCLH

Short-haul markets have become inundated with LCCs, as evidenced by falling route frequencies in the U.S. and Europe in favor of fueling growth by seeking out new point-to-point routes over increasing stage lengths (De Wit & Zuidberg, 2012). Renewed interest in LCLH was prompted by liberalization of air markets, including the U.S.– European Union (E.U.) Open Skies Agreement; lower fuel prices; the ability of LCCs to compete on the basis of price while deriving an increasing portion of revenue from ancillary sources; and high airfares, coupled with lack of low-fare options in the trans-Atlantic market (De Poret, O'Connell, & Warnock-Smith, 2015). The introduction of new aircraft including fuel-efficient, wide-body jets led by the Boeing 787 Dreamliner and narrow-body jet, longer-range derivatives, including the B737MAX and A321neoLR, have also spurred LCLH interest (De Poret et al., 2015).

The stronghold that the *big three* airline alliances (Oneworld, SkyTeam, and Star Alliance) have had on the trans-Atlantic market is weakening, and during summer of 2017 their market share was 70% (Centre for Asia Pacific Aviation [CAPA], 2017c). While LCLH carriers held a mere 1% trans-Atlantic market share in 2014, their market

share grew to 6% in 2017, and is projected to reach 8% in 2018 (CAPA, 2018f). LCLH trans-Atlantic flight frequencies have rapidly grown, reaching 9.5% in 2017 (Boeing, 2017). Independent LCLH carriers such as Norwegian Air, WOW air, and WestJet have been flooding the market with low airfares, which has lead to system-wide, trans-Atlantic capacity climbing by 7–9% per quarter throughout 2017 (Sumers, 2017a). Meanwhile, FSCs are rushing to launch their own LCLH subsidiaries, and are seeking to attract these price-sensitive passengers to their mainline operations with basic economy fares. These are not the fledgling LCLH carriers that were easily driven out of the market by FSCs in the past. "Legacy [FSC] airlines on both sides of the Atlantic see a low-cost competitor [Norwegian] on their cash-cow routes as a major threat to their long-term profitability" (Mouawad, 2016, para. 8). While LCLH carriers do not bode well for FSCs, they are a positive for the flying public, as trans-Atlantic travel is within reach for more prospective travelers. A recent Norwegian Air trans-Atlantic passenger said this about LCLH carriers: "They seem to have made the world a little smaller place, making it so affordable to get to Europe" (Carey & Wall, 2016, para. 3).

Trans-Atlantic LCLH Carriers

Norwegian Air. Norwegian Air, which is Europe's third largest LCC, brought the LCLH business model back to the trans-Atlantic market in 2013, being the first in decades to offer nonstop, low-cost service between the U.S. and Europe (Yousef, 2017). Norwegian Air initially focused its B787 Dreamliners (shown in Figure 1) on serving the California, Florida, and New York markets; however, it has rapidly been diversifying its route structure and adding new U.S. cities. During summer of 2017, Norwegian Air began deploying its newly delivered narrow-body B737MAX 8 aircraft on trans-Atlantic routes linking smaller secondary airports on the eastern seaboard of the U.S., including New York Stewart Airport, T.F. Green Airport (Providence, Rhode Island), and Bradley Airport (near Hartford, Connecticut) with Europe, touting one-way airfares as low as EUR69 (CAPA, 2017c). Regarding B787 service, Norwegian added U.S. cities Denver and Seattle during fall of 2017, and inaugural service to Austin and Chicago commenced in spring of 2018. Norwegian Air currently operates 58 trans-Atlantic routes, providing passengers with unparalleled air travel options (Silk, 2017). Figure 2 shows Norwegian Air's trans-Atlantic route map.

As evidence of Norwegian Air's rapid expansion, the carrier's capacity grew by 80%, from 49,000 to 87,000 seats per week in long-haul markets from May to October of 2017 (CAPA, 2017b). Norwegian Air will grow its B787 fleet to 53 aircraft by 2020 while also expanding its narrow-body fleet (CAPA, 2016h). However, Norwegian Air's swift long-haul growth has been overshadowed by its lackluster financial results, as in 2017, the company posted a net loss of NOK299 million (operating loss of NOK1.8 billion) as it faced increasing unit costs and declining unit revenue (CAPA, 2018c).

While Norwegian appeals to price-sensitive leisure travelers by offering a low trans-Atlantic fare, its premium economy class is holding appeal for business travelers who might not be authorized for a higher class of service due to corporate travel policies (Spinks, 2018a). Norwegian's premium economy fares are approximately 50% lower than FSCs (Spinks, 2018a).



Figure 1. Sonja, Norwegian's first B787 Dreamliner at LAX Airport. August 19, 2017.



Figure 2. Norwegian Air trans-Atlantic route map. Reproduced from Timetablist, 2017.

WOW air. WOW air, which was a low-cost, short-haul (LCSH) carrier established in 2012, commenced trans-Atlantic LCLH service in 2015 from the East Coast of the U.S., utilizing the A320/A321; and in 2016 it added the wide-body A330, which has the range to serve U.S. West Coast airports (CAPA, 2017e). WOW air currently has a fleet of 18 aircraft, with seven on order which includes four A330neo aircraft (CAPA, 2018a). Icelandic LCLH carrier WOW air leverages its home base of Keflavík as its stepping-stone between North America and mainland Europe, routing all of its flights via this airport. WOW air offers passengers flying from North America to/from mainland Europe a stopover in Iceland at no additional charge, stating, "It's almost like getting two vacations for the price of one" (WOW air, n.d.). By utilizing Iceland as a hub and putting a positive spin on the requisite stopover, WOW air is emulating the approach of one of its chief competitors, FSC Icelandair.

WOW air's newest uncontested routes, which were launched in spring of 2018, are from Keflavík to Cincinnati, Cleveland, Dallas, Detroit, and St. Louis (CAPA, 2017e). Figure 3 shows WOW air's route map, including routes from Keflavík to 15 U.S./Canadian and 20 European cities (WOW air, 2018). WOW air has been growing at a rapid pace, and its seat capacity has increased by 60% from August of 2016 to August of 2017, and the carrier was expected to have had 3 million seats on offer in 2017 (CAPA, 2017e). As WOW air has grown, it has been boldly moving into hubs of U.S. FSCs, offering its inexpensive one-stop service to mainland Europe as an alternative for price-sensitive air travelers. WOW air has also noted that business travelers have been gravitating to its trans-Atlantic flights for airfare purchases without much lead time, rather than paying a steep fare to fly an FSC (CAPA, 2016g).



Figure 3. WOW air trans-Atlantic route map. Reproduced from WOW air (2018).

WestJet. Canadian LCC WestJet expanded from LCSH to LCLH operations in 2014, when it commenced trans-Atlantic service from Canada to Dublin on a seasonal basis. In 2015, WestJet branched into wide-body aircraft with the B767-300ER. In May of 2016, in response to WOW air's entry into the Canadian market, WestJet bolstered its service from Toronto and Calgary to London–Gatwick to year-round, with additional routes served on a seasonal basis (Belfast Telegraph, 2016). WestJet's summer of 2018 schedule features service from Canada to four European airports: Dublin, Glasgow, London–Gatwick, and Paris. WestJet has recently added the B737MAX to its fleet, and in 2019 it will take delivery of the first of 10 B787 Dreamliners (Tomesco & Katz, 2017). WestJet is outfitting its Dreamliners with lie-flat business class seats, in addition to

offering premium economy and economy cabins, which is a sign that the carrier is diverging from its LCC roots (Tomesco & Katz, 2017).

Rouge. Air Canada's low-cost airline-within-airline (AWA) Rouge has a B767 fleet and is serving LCLH trans-Atlantic routes as well; however, it does not have a one-market focus, and deploys aircraft in multiple long-haul markets (Landauro & Wall, 2016).

Eurowings. Given that Norwegian Air and WOW air are serving Germany, Lufthansa has been facing LCLH competition on its often-lucrative, long-haul routes. Lufthansa established a low-cost subsidiary called Eurowings, which initially operated LCSH, but it expanded into LCLH trans-Atlantic operations in 2016 with an initial route of Miami to Cologne (Just About Travel, 2016). With the collapse of German FSC Air Berlin, Eurowings is seizing the opportunity to fill the void left in the trans-Atlantic market (ch-aviation, 2018). Eurowings serves the following U.S. cities with nonstop service to Germany, including its 2018 service additions: Fort Meyers, Las Vegas, Miami, New York, and Seattle (Perkins, 2018). Eurowings currently has a fleet of seven A330s operated on its behalf by SunExpress (ch-aviation, 2018).

French Bee. While one of the newest entrants into the LCLH trans-Atlantic arena was named French Blue, it was renamed French Bee due to objections from JetBlue pertaining to the usage of the word *blue* (CAPA, 2018b). French Bee launched its initial trans-Atlantic service in spring of 2018, with an A350 from Paris Orly to San Francisco

(CAPA, 2018b). In the spirit of being a low cost operator, French Bee is packing in 10 seats per row, in comparison to Delta, which offers a more spacious nine seats across on its A350 aircraft (SeatGuru, 2018).

LEVEL. International Airlines Group (IAG), the parent company of British Airways and Iberia, launched LEVEL, its LCLH AWA subsidiary during summer of 2017. LEVEL had an initial trans-Atlantic route between Barcelona and Los Angeles, and subsequently added service to Oakland (CAPA, 2017d). LEVEL will be competing head-to-head with Norwegian in the New York market in 2018 (Coffey, 2017). LEVEL's fleet of A330 aircraft will number five in 2018 (CAPA, 2017d). LEVEL's fleet is anticipated to grow to 30 aircraft by 2022 (Coffey, 2017). LEVEL is being integrated into IAG through relationships leveraged with other airlines via codesharing, feeder traffic, hauling of cargo, and a frequent flier program (CAPA, 2017d). However, since IAG rapidly launched LEVEL to compete with Norwegian's new long-haul Barcelona service, LEVEL was pressed into service with aircraft and crews borrowed from Spanish FSC Iberia. Furthermore, the resources of OpenSkies, an IAG owned FSC—both planes and crews—will be transferred to LEVEL by fall of 2018 (Coffey, 2017). CAPA (2017d) noted the adverse impact that this could have on LEVEL: "Although this is only an interim phase, this may hamper its chances of establishing its own distinct culture as it will have been strongly influenced by Iberia (and IAG Cargo) in its crucial early stages" (para. 35). American VP of Revenue Management Don Casey stated that "[IAG] believes quite strongly that this low-cost model is sustainable and it

will over time have a material share of the transatlantic business. They want to make sure that they have a piece of that low cost carrier market" (Sumers, 2017a, para. 13).

Primera Air. One of the newest North Atlantic competitors is Primera Air, which transitioned from being a European LCC to establishing LCLH routes as of spring 2018 (CAPA, 2017f). While Primera Air operates only nine B737NG aircraft, it is acquiring the B737MAX and A321neoLR for its LCLH operations, which will grow its fleet size to a projected 35 aircraft, while keeping an all-narrow-body fleet (CAPA, 2017f). Primera Air is the launch customer for the Airbus A321neoLR, thus it will be the first carrier to be able to leverage this aircraft's longer range to expand its reach (CAPA, 2017f). Primera Air's initial service will include U.S. airports in Boston, Washington– Dulles, and Newark; and the European airports of Birmingham, London–Stansted, and Paris. While Primera Air does have a hub at Keflavík, it has not announced any plans yet to follow in the footsteps of Icelandair and WOW air with connecting trans-Atlantic service.

Joon. Air France–KLM launched a new LCLH AWA named Joon in December of 2017. Joon's initial long-haul routes are from Europe to Africa, the Middle East, and South America; and the carrier is being tasked with acquiring money-losing Air France routes and going head-to-head with Gulf carriers (CAPA, 2017g). Three goals have been set for Joon: reestablish routes that were not viable for an FSC to serve, compete on the basis of price in current markets, and utilize 30% of capacity to enter new markets (Gubisch, 2016). Joon is lacking sufficient autonomy from its parent Air France, and while its cost structure is expected to be lower than that of Air France, it will be commensurate with that of KLM, rather than an LCLH carrier (CAPA, 2017g). Although Air France is entering the LCLH fray with Joon, an executive was "sceptical about the sustainability of year-round profits for long-haul low-cost" (CAPA, 2016e, para. 3).

While Joon is showing that it could have intent for future LCLH trans-Atlantic operations, since it has requested U.S. air rights, no announcements have been made (CAPA, 2017g). This would be a logical progression for Joon, considering that Air France is under increased pressure now that it is competing on trans-Atlantic routes out of Paris with LCLH carriers including Norwegian Air and French Bee.

JetBlue – LCLH interest. JetBlue is pondering establishment of LCLH trans-Atlantic service, and it has options for the A321neoLR, which has sufficient range for shorter trans-Atlantic routes (CAPA, 2016c). JetBlue has a loyal following of business travelers, and its 'Mint' product features lie-flat business class seats on trans-continental flights, which is a leap above the typical domestic first class offering of U.S. FSCs. CAPA (2016c) has hypothesized that if JetBlue enters the trans-Atlantic market, it could base operations from Boston and could take a middle-market approach, positioning itself between FSC and LCLH carriers. If JetBlue's Mint product makes a trans-Atlantic debut, then it is foreseeable that the carrier could be targeting the upper echelon of the market, posing a serious threat to FSCs and their business class product (CAPA, 2016c).

Competitive Responses to LCLH

FSC protectionism. U.S. FSCs responded to LCLH market entry with protectionism by leveraging resources of labor unions, politicians, and governmental agencies to establish roadblocks for LCLH carrier Norwegian Air and delaying U.S. market entry of its Norwegian Air International (NAI) subsidiary with their *deny NAI* campaign (Jansen, 2016). The Irish NAI subsidiary is critical to the growth of Norwegian Air's long-haul operations, since it grants the carrier E.U. traffic rights (Yeo, 2016). Norwegian Air consultant John Byerly has said it best:

These unions have spent tens of millions of dollars on a political campaign to shut NAI out of the U.S. market, to restrict competition and effectively feather their own cozy nests in the trans-Atlantic market. They've reacted with a mixture of desperation, frenzy and a bundle of just plain wrong arguments. (Jansen, 2016, para. 12)

Norwegian Air CEO Bjorn Kjos stated that, "Competition is good. Politicians should understand that what's good for the consumer is good for the country. It might not be good for airlines, but then again if you cannot tolerate competition, then you are in the wrong business" (Sumers, 2016b).

Protectionism proved to be not much more than a temporary hindrance regarding LCLH, and an unsustainable strategy. While NAI's foreign air carrier certificate was stalled for an unprecedented three years, NAI prevailed, and the U.S. Department of Transportation eventually granted that certificate to the Irish subsidiary in December of 2016 (Yeo, 2016). Norwegian has also been granted foreign air carrier operating certificates for Norwegian Long Haul, its Norway-based subsidiary, and also Norwegian

U.K., which are paving the way for its continued expansion (Silk, 2017). The new administration is backing Norwegian, acknowledging the importance the carrier has for Boeing and American jobs (Zhang, 2017). So now that trailblazer Norwegian Air has led the way for additional LCLH entrants, U.S. FSCs have shifted their focus toward developing strategies to compete with LCLH carriers.

LCLH airlines-within-airlines. A strategy that some FSCs have employed to cater to price-sensitive leisure travelers flying long-haul has been to create their own LCLH AWA subsidiary. LCLH AWAs established by FSCs have taken flight in the European and Asia-Pacific regions, including Eurowings (parent Lufthansa), LEVEL (parent IAG), Joon (parent Air France), Rouge (parent Air Canada), Jetstar (parent Qantas), and Scoot (parent Singapore Airlines). In particular, European and Asian FSCs have been forced to compete with LCLH carriers in their home markets.

Graham and Vowles (2006) discussed four key reasons why FSCs could opt to establish an AWA: (a) to achieve a lower cost structure; (b) to segment their brand and have a product that targeted economy class travelers; (c) to discourage LCCs from initiating service; or (d) to compete on the basis of price with LCCs already serving their markets. However, a risk of this strategy was pointed out by Graham and Vowles (2006, p. 107), which include "dilution and downgrading of the mainline product and cannibalization of its markets." While AWAs were able to achieve some cost advantage over their parent airlines, it was not equivalent to the LCCs they were competing against (Gillen & Gados, 2008; Pearson & Merkert, 2014). However, over half of the AWAs studied had lower load factors than their parents, thus the AWAs were unable to compensate for the lower yields by keeping aircraft fuller (Pearson & Merkert, 2014). Clive Beddoe, former CEO of Canadian LCC WestJet, in an epic quote, stated, "You don't lower the cost of your operations by repainting airplanes" (Grescoe, as cited in Graham & Vowles, 2006). In a rush to get LCLH subsidiaries airborne, that is exactly the tactic employed both by LEVEL and Joon.

While FSCs such as Singapore Airlines and Qantas have successfully managed the dichotomy of being a company with LCLH and FSC operations and segmenting their market, others such as Iberia's LEVEL and Air France's Joon seem to be LCLH in name only, as in the race to bring these carriers to market they merely borrowed planes and crews along with their cost structure from their parent FSCs. While such LCLH AWAs may not be able to achieve a cost structure commensurate with that of independent LCLH carriers, at least they will be in the game. Establishing an LCLH AWA subsidiary is a tactic that no U.S. carrier has yet to embrace, as the pain of their failed attempts at creating AWAs to compete with LCCs in short-haul markets still lingers. While multiple U.S. FSCs established LCSH AWAs in the 1990s and 2000s, none were successful (Pearson & Merkert, 2014). The establishment of a U.S. LCLH AWA is not expected, since it is unlikely that it could achieve the necessary cost advantage. John Heimlich, VP and Chief Economist for Airlines for America which is an advocacy group for U.S. airlines, does not anticipate that U.S. FSCs will establish LCLH AWAs (personal communication, January 9, 2018). Furthermore, since an AWA could threaten the jobs of pilots and cabin crew as work shifts to an LCLH with second-tier pay scales, this could create discord amongst labor unions and employees and result in economic damage, as with strikes. In the words of Tony Fernandes, CEO of AirAsia, regarding AWAs: "I
think it's a fad. It's a panic. . . . Why should they [network carriers] be diluting their yields? . . . If they really want to have a low-cost carrier they have one at the back of their planes" (Airline Business, as cited in Graham & Vowles, 2006, p. 124). However, years later, Tony Fernandes, speaking at the CAPA–ACTE Global Summit, reversed his stance and predicted that:

There would be a divergence between low-cost and full service models. Mr. Fernandes said that airlines trying to be full service at the front and low-cost at the back are pursuing an unsustainable model. "Airlines can't do everything," Mr. Fernandes said, then predicting that eventually the industry will be split into purely low-cost and full service players, with LCCs focusing on value-conscious consumers and FSCs focusing on passengers that are prepared to pay more. "When that happens we will become a more efficient industry," Mr. Fernandes said. (CAPA, 2016f, para. 18–19)

FSC no-frills offering. Since this dissertation research was conducted, FSCs have announced changes in order to appeal to price-sensitive travelers and more effectively compete with LCLH carriers. John Heimlich of Airlines for America did foresee that in the trans-Atlantic market FSCs would unbundle their long-haul offering to compete on the basis of price, which is a strategy being carried over from short-haul markets (personal communication, January 9, 2018). In April of 2018, basic economy— otherwise referred to as hand-baggage-only (HBO) fares—were rolled out in the trans-Atlantic market by FSCs including Air France–KLM, American, British Airways, Delta, and Virgin Atlantic (Spinks, 2018b). The key differences with HBO fares are that

checked baggage and seat assignments are not included; and depending upon the particular FSC there may be further restrictions, like the inability to cancel or change a ticket, being in the last group to board, and/or no upgrades permitted for frequent fliers (Spinks, 2018b).

Delta's tactic is to lure trans-Atlantic passengers with its advertised low fares and then employ a bait-and-switch approach. Delta noted that its experiment with selling a basic economy domestic product resulted in 50% of the passengers being willing to pay more to purchase the standard economy product (Josephs, 2017). Delta President Glenn Hauenstein stated, "The success of that product [basic economy] in our minds is not how many people buy it, but how many people don't buy it and choose another product" (Sumers, 2017b, para. 10). Regarding basic economy, Hauenstein also said that "It's more of a defensive product than it is an offensive product," which suggests that Delta lacks aspirations of running an LCLH-like operation (Sumers, 2017b, para. 12). American Airlines cannot afford to concede price-sensitive travelers to LCLH carriers, and while the role of infrequent economy class travelers is often understated, 87% of American's passengers fly on the carrier once in a given year and constitute 50% of its revenue (Jansen, 2015). American Airlines VP of Revenue Management Don Casey stated, "We want to make sure we are competitive with their [LCLH] price offers in the marketplace, with products that are both bundled and unbundled" (Sumers, 2017a, para. 8).

Industry leaders and analysts differ in opinion regarding whether or not the entry of LCLH carriers could result in FSCs competing solely on price and with a commoditized product, which has been seen in the U.S. domestic market, or if the FSC business model will be enduring. Time will tell whether FSCs seek to further unbundle their HBO offerings and embrace a no-frills concept more akin to the trans-Atlantic LCLH carriers. Jay Sorensen of IdeaWorks Consulting (2016) anticipates a no-frills, economy class product becoming the global norm for FSCs, and is of the opinion that:

Some may mourn the passing of simpler times when a long-haul ticket price included the promise of a checked bag, seat assignment, and an oftentimes inedible meal. But consumer behavior supports the popularity of seat-only tickets that deliver a lower price. The array of choices provided by a la carte methods allows these consumers to click and pay a premium for more comfort and convenience. (p. 8)

Existing Passenger Survey Research

For the purpose of the introduction, a summary of passenger choice literature is presented in Chapter I. The following passenger survey literature will be discussed in turn: LCLH, trans-Atlantic, and LCC vs. FSC. A comprehensive discussion of the existing literature is contained in Chapter II.

LCLH passenger research. Only three survey research studies have been found that considered LCLH carriers at the time of the writing of this dissertation. Yeung, Tsang, and Lee (2012) explored the importance of impact variables or factors for potential LCLH passengers in Hong Kong; which lends support to comfort, in-flight service, and aircraft type being more important to passengers flying an LCLH than an LCSH carrier. Furthermore, Yeung et al. (2012) found that LCSH passengers would be unwilling to fly an LCLH carrier due to the following reasons: safety, seat comfort, and preference of service to price. However, a shortcoming of this research was that, due to the recent resurfacing of the LCLH business model, LCSH passengers were surveyed and used as a proxy. Jiang (2013) compared service quality of LCLH carriers AirAsia X and Jetstar, and determined that assurance (safety) was most important to passengers, followed by airfare and reliability. However, Jiang's (2013) research was a comparison of two LCLH carriers, and did not entail a comparison with FSCs, plus the findings may not be generalizable beyond the Asia-Pacific market. Rodríguez and O'Connell (2018) surveyed long-haul charter passengers in Spain and found that older travelers or families would prefer an all-inclusive holiday package provided by a charter carrier, whereas younger travelers would be more inclined to switch to an LCLH carrier and make their own arrangements. While a handful of studies on LCLH have been published, nearly all within the past decade (Daft & Albers, 2012; De Poret et al., 2015; Francis, Dennis, Ison, & Humphreys, 2007; Jiang, 2013; Moreira, O'Connell, & Williams, 2011; Morrell, 2008; Pels, 2008; Rodríguez & O'Connell, 2018; Soyk, Ringbeck, & Spinler, 2017; Wensveen & Leick, 2009; Whyte & Lohmann, 2015; Yeung et al., 2012), a need still exists for passenger-focused research.

Norwegian Air CEO Bjorn Kjos was asked if passengers select their LCLH carrier solely on the basis of price. While Kjos acknowledged that passengers consider airfare as their top criterion, he also noted that safety and new aircraft were also important (Sumers, 2016b). Furthermore, in regard to what passengers anticipate getting for a low fare, Kjos stated, "They want enough legroom and they want a hassle-free journey" (Sumers, 2016b).

Trans-Atlantic passenger research. Several passenger survey studies have been conducted in the trans-Atlantic market utilizing the SERVQUAL service quality scale to evaluate expectations and perceptions of FSC passengers. SERVQUAL was developed by Parasuraman, Zeithaml, and Berry (1988) and consists of five constructs: tangibles, reliability, responsiveness, assurance, and empathy. Using SERVQUAL in the trans-Atlantic market, Sultan and Simpson (2000) evaluated expectations and perceptions of FSC passengers by nationality; Pham and Simpson (2006) considered frequency of air travel; and Pham (2011) considered gender. However, these studies were constrained by only evaluating SERVQUAL scores on the basis of demographics and trip characteristics. Furthermore, SERVQUAL overlooks aspects of air travel such as amenities, comfort, and convenience, any of which could be distinguishing criteria for passenger choice of FSC or LCLH carrier. While large-scale passenger survey research is being done—such as M1nd-set's Airs@t Survey which includes the trans-Atlantic market in partnership with the International Air Transport Association (IATA)-this research is not in the public domain or scholarly literature, as it is analyzed and sold to airlines and other interested parties for purposes such as benchmarking against competitors or evaluating customer satisfaction.

LCC vs. FSC passenger research. Passenger choice of LCC or FSC has been extensively studied in the scholarly literature, and airfare is often one of the key criteria regarding what most affects a passenger's choice of carrier, particularly for LCC passengers (Forgas, Moliner, Sánchez, & Palau, 2010; O'Connell & Williams, 2005; Ong & Tan, 2010; Thanasupsin, Chaichana, & Pliankarom, 2010). While airfare has often been the overriding impact variable or factor for passenger choice of LCC, others have been understated. Furthermore, the existing survey research has led to inconsistent and contradictory findings regarding which impact variables or factors are most important to passenger choice. Potential causes for this could include: (a) demographic differences; (b) cultural and nationality differences; (c) trip purpose; (d) differences in localized air markets that affect competition, travel options, and airfares; (e) survey questionnaire and scale construction not standardized between studies, thus making direct comparison not possible; and (f) surveys having been conducted at different points in time.

While passenger choice of LCC or FSC has been examined in European shorthaul markets (Castillo-Manzano & Marchena-Gómez, 2011; Forgas et al., 2010; Kuljanin & Kalić, 2015; Kurtulmuşoğlu, Can, & Tolon, 2016; Mason, 2001; Mikulić & Prebežac, 2011; O'Connell & Williams, 2005), recent passenger choice studies comparing LCC or FSC have not been found in the U.S. Additionally, the findings of existing scholarly research on passenger choice of LCC or FSC in short-haul markets may not be generalizable to long-haul markets, and existing research has not been found for LCLH versus FSC in any air market.

Other key criteria cited by LCC and FSC passengers affecting their choice of carrier included reliability, convenience, and safety perception. Service quality has been more associated with FSCs than LCCs. Comfort was often overlooked in passenger choice studies; however, it could take a leading role for long-haul flights, as research by Yeung et al. (2012) suggests. The importance of frequent flier programs has been primarily associated with choice of FSC for the following classifications of traveler: business travelers, frequent fliers, those loyal to a particular carrier, and/or who are active

participants in a frequent flier program (Alamdari, 1999; Fourie & Lubbe, 2006; Mason, 2001; O'Connell & Williams, 2005; Proussaloglou & Koppelman, 1995, 1999; Suzuki, 2004). Frequent flier programs were deemed last priority for Hong Kong travelers queried about taking an LCLH flight (Yeung et al., 2012). Several impact variables or factors were consistently not key criteria for passenger choice, including brand image and reputation (Alamdari, 1999; Lu & Tsai, 2004; Park, 2007; Yeung et al., 2012), food and beverage (Balcombe, Fraser, & Harris, 2009; Fourie & Lubbe, 2006; Kurtulmuşoğlu et al., 2016; Min & Min, 2015), and IFE (Alamdari, 1999; Chen, Peng, & Hackley, 2008; Fourie & Lubbe, 2006; Kurtulmuşoğlu et al., 2016). However, since these impact variables or factors could be considered differentiators between the LCLH and FSC product in the trans-Atlantic market, they warrant inclusion to determine whether or not they hold importance for passenger choice of carrier.

Statement of the Problem

Survey research regarding passenger choice of an LCLH or FSC has not been found in the scholarly literature for any air market. The existing passenger survey research in the trans-Atlantic market is outdated and limited in scope, and it is a rarity for passenger survey research to be conducted at U.S. airports. While LCLH carriers generate ancillary revenue via unbundling of their product, in the trans-Atlantic market it is not known to what extent passengers could be receptive to giving up amenities, comfort, convenience, and service on flights of a longer stage length in exchange for a lower fare. Thus research is needed to better understand the priorities and preferences of long-haul passengers, and what impact variables or factors determine their choice of LCLH or FSC in the trans-Atlantic market, along with willingness to switch carrier type and amount willing to pay. This dissertation has taken a holistic approach to determining which impact variables or factors are most important regarding passenger choice.

Purpose Statement

The purpose of this dissertation was to identify a factor structure for LCLH passengers; and also to evaluate what demographic characteristics, trip attributes, and airline service attributes affect passenger choice of an LCLH or FSC in the trans-Atlantic market using the passenger survey research method. This dissertation addressed a gap in the scholarly literature, as it was the first known study to have identified a factor structure for LCLH and FSC passengers, as well as to have considered passenger choice of an LCLH versus FSC. The survey instrument for this dissertation was designed to place greater emphasis on comfort, amenities, and service, since they were expected to be of increased importance to passengers on longer flights but had often been overlooked in prior research, which generally focused on passenger choice of FSC or LCSH carrier. Additionally, willingness to pay research offered insights relevant to the price point at which a trans-Atlantic passenger would be willing to switch to or from an FSC or LCLH carrier, and what affected that decision. This could provide data of relevance for LCLH and FSCs alike to develop strategies to tailor their offerings to meet the needs of their customers, while operating in a competitive business environment.

Research Questions

The following research questions were addressed in this dissertation:

- [1] What were the underlying constructs for passengers' evaluation of their trans-Atlantic air travel experiences, comprised of passenger satisfaction attributes?
- [2] How did passengers prioritize impact variables/factors when selecting their trans-Atlantic LCLH or FSC, and which impact variables/factors, demographics, and trip characteristics influenced choice of carrier?
- [3] Were LCLH passengers willing to switch to an FSC for a trans-Atlantic flight? If so, how much *more* in airfare were they willing to pay, and which impact variables/factors and demographics were determinants?
- [4] Were FSC passengers willing to switch to an LCLH carrier for a trans-Atlantic flight? If so, how much *less* in airfare were they willing to pay, and which impact variables/factors and demographics were determinants?

Significance of the Study

Theoretical significance. A key theoretical contribution of this dissertation was establishment of a valid and reliable factor structure for passenger survey research concerning LCLH and FSCs, as this had not been found in the scholarly literature. This dissertation also served as a foundation for passenger choice of LCLH or FSC research, since impact variables or factors that were important to economy class travelers in the trans-Atlantic market are not known to have been identified. By collecting demographic and trip characteristic data from passengers, future research was supported, since it could then be determined whether the factor structure and pertinent passenger choice variables might have broader applications in other long-haul markets, where passengers have a choice of flying an LCLH or an FSC.

Practical significance. With LCLH carriers making substantial inroads in the trans-Atlantic market, it is apparent they will have a profound impact on the future of long-haul travel. While LCLH carriers have attracted the attention of FSCs and LCCs alike, the business model has received scant attention in the scholarly literature, as only a handful of studies have been published. While FSCs have long focused on their lucrative business and first class travelers, economy class travelers are now commanding their attention, as they cannot afford to concede the lower end of the market to LCLH carriers. Norwegian Air CEO Bjorn Kjos stated, in regard to trans-Atlantic LCLH, that "growth in the industry will not come from the business market, it will be the leisure market" (Moores, 2016, para. 18), which supports the emphasis this dissertation has placed on economy class travelers.

Experts have noted that LCLH passengers are a topic that warrants additional research. Whyte and Lohmann (2015) noted that, "An unknown for perhaps further research is whether airline consumers would be willing to forego some comfort and service levels for a more attractive airfare by traveling on a 'no frills' airline" (p. 164). Yeung et al. (2012) suggested that passenger choice of LCLH or FSC be evaluated. Other LCLH studies, which will be discussed in Chapter II, focused on the economic viability of the LCLH business model and contained multiple assertions pertaining to what passengers want. While these were statements made by experts with extensive

airline industry knowledge, they were conflicting and unsubstantiated, since they were not evaluated via passenger survey research. Thus a dire need exists for research regarding LCLH carriers and passenger choice, as the existing scholarly knowledge on this topic is sparse, and LCLH carriers are being established and are expanding at a rapid pace.

Delimitations

Several delimitations set the boundaries for this dissertation. The surveys were conducted on the U.S. end of trans-Atlantic routes at two airports: Los Angeles (LAX) and Seattle–Tacoma (SEA). The rationale for airport selection included the researcher's preference to survey passengers from West Coast airports with longer trans-Atlantic routes since comfort, service, and amenities are often of greater importance with increased flight duration; presence of both LCLH and FSC flights; and Boeing colleagues who had personal connections that facilitated gaining approval from these airports. Passengers surveyed at SEA and LAX Airports were in the airside departure lounge area and flying to either London or Keflavík on specified flights.

Since convenience sampling was utilized, it was not required that all airports and routes in the trans-Atlantic market be included in the sampling frame. The survey was bidirectional, with some travelers completing surveys based on a Europe to U.S./Canada flight and others on a U.S. to Europe flight, thus multiple routes were included in the sample.

Only passengers from LCLH carriers WOW air and Norwegian Air, which are both independent (unaffiliated with FSCs) and operate in the U.S. market, were approached to be surveyed. While a token number of passengers were included in the sample from Eurowings, WestJet, and LEVEL, these airlines were not specifically targeted for the passenger survey. LEVEL was not targeted, since although it serves LAX, its departure times conflicted with those of WOW air, plus the survey instrument might have required translation into Spanish. Eurowings was not targeted, as the airline does not operate its own LCLH flights. Canadian LCLH carriers Rouge and WestJet were not targeted, since their trans-Atlantic flights operate out of Canadian airports. FSC passengers from three airlines—American Airlines, British Airways, and Virgin Atlantic—were approached to be surveyed, due to logistics. Only passengers traveling in economy or premium economy were selected, since those were the two classes of service that both LCLH and FSCs may offer. Thus business and first class travelers of FSCs were excluded, and non-travelers were not surveyed. While the above reasons resulted in passengers from fewer airlines being included, these delimitations were necessary for validity of the data.

The survey was conducted in English, since it was the language most widely spoken by those surveyed at LAX and SEA. Passengers who did not understand written or spoken English were excluded, unless they were given assistance with translation from a fellow traveler who spoke their language and was willing to help. The detailed sampling process is provided in Chapter III.

Limitations and Assumptions

This dissertation had several limitations. Using a survey was an indirect method of evaluating a respondent's experience, thus there was artificiality. However, survey

research is the generally accepted methodology for examining the experiences of airline passengers. Passengers did not represent a random sample from the population, because convenience sampling was utilized. Since the survey was conducted over a three-month timeframe, seasonal variation was not accounted for, and demographic characteristics of air travelers could differ between peak and off-peak seasons (Biggs et al., 2009). However, the time of year that the survey was conducted was not pertinent to this dissertation, since the data from LCLH and FSC passengers used in the statistical analyses was collected in a similar timeframe. The sampling plan included flights occurring on both weekdays and weekends.

The distribution of demographic characteristics and trip purpose of trans-Atlantic passengers at LAX and SEA Airports, which primarily focused on the London and Keflavík routes, was expected to differ from the broader population of trans-Atlantic travelers, to some extent. Chapter IV compares the dissertation demographic data to that of a large-scale survey. The findings of this dissertation are not expected to be generalizable beyond the trans-Atlantic market; because further research would be needed to account for the differences in demographic characteristics of passengers, airlines, and dynamics within other long-haul markets. Another limitation is that while the impact variables or factors that affect passenger choice of LCLH or FSC were identified, the relationships between latent constructs or factors were not examined. However, this was per design, as Structural Equation Modeling (SEM) was not the appropriate statistical method to address the research questions. By conducting the survey in English only, a limitation was that those passengers who did not understand written or spoken English could have been excluded; however, it was not anticipated to

have an appreciable effect on the demographic characteristics of passengers included in the sample. The aforementioned limitations were taken into consideration during data collection and when interpreting the results, and they did not affect achieving the intent of the dissertation.

This dissertation had several assumptions that were met. The ERAU Institutional Review Board (IRB) approved of this dissertation research. Approvals from Los Angeles World Airports (LAWA) and the Port of Seattle were granted to conduct the surveys at LAX and SEA Airports respectively in the airside departure lounge areas. Agreement from the airports was obtained regarding the sampling plan, including specific dates, times, locations, and specific flights for the survey. The additional surveyor was provided training by the primary researcher regarding how to conduct the survey and followed standardized procedures. Passengers surveyed had taken a recent trans-Atlantic flight in premium economy or economy class, were at least 18 years of age, and agreed to the content on the consent form. Passengers who did not meet these criteria were identified via screening questions and were excluded. Passengers surveyed were able to read and write in English, or understood spoken English or had assistance with translation to their native language if the questionnaire was completed on their behalf. Passengers were inclined to answer the questions truthfully. Assumptions inherent in the statistical methods utilized were met before proceeding with the analysis.

Definitions of Terms

Airline-Within-Airline

A subsidiary airline that is operated and controlled by a parent airline.

Ancillary Revenue	Revenue generated by non-ticket sources such as	
	cargo, baggage, meals, beverages, seat	
	assignments, priority boarding, and in-flight	
	entertainment.	
Feeder Traffic	Non-origin-to-destination: passenger traffic that	
	resides outside of the catchment area for a long-haul	
	flight, requiring passengers to take a connecting	
	flight either at the starting and/or ending point of	
	their long-haul trip (Wilken, Berster, & Gelhausen,	
	2016).	
Full-Service Carrier	An airline that typically offers economy and a	
	business/first class product, utilizes a hub and spoke	
	system, offers a broad network of flights, has a	
	frequent flier program, and operates multiple fleet	
	types (Wensveen, 2011).	
Load Factor	Percentage of seats that are occupied by passengers	
	on a flight.	
Long-Haul Flight	Flight duration of 6+ hours.	
Low-Cost Carrier	A generic term that is associated with an airline	
	with a low cost structure. A low-cost carrier could	
	operate on short-haul and/or long-haul routes.	

Low-Cost, Long-Haul Carrier A low-cost carrier that typically has a wide-body			
fleet of aircraft and operates on flights of a duration			
of 6+ hours.			
Low-Cost, Short-Haul Carrier A low-cost carrier that typically has a narrow-body			
fleet of aircraft and operates on short-haul routes.			
Flight duration of 4 to 6 hours.			
Achieved by low-cost, short-haul carriers			
through means such as fleet commonality,			
quick turns, high aircraft utilization, low			
labor costs, and no-frills.			
Direct travel from point of origin-to-destination.			
Airport that serves as the gateway for air travel and			
is often utilized by major airlines as a hub.			
Distance from one seat at a given point to the seat			
either in front of it or behind it at the same point.			
A smaller airport in the vicinity of a very busy			
airport that may offer less congestion, lower fees,			
and could be less convenient to city center. Low-			
cost carriers often favor secondary airports.			
Flight duration of less than 4 hours.			
From takeoff to landing, the distance via air travel.			

List of Acronyms

ACI-NA	Airports Council International–North America	
AGFI	Adjusted Goodness of Fit	
ANOVA	Analysis of Variance	
ATI	Anti-Trust Immunity	
AVE	Average Variance Extracted	
AWA	Airline-Within-Airline	
CAB	Civil Aeronautics Board	
CAPA	Centre for Asia Pacific Aviation	
CFA	Confirmatory Factor Analysis	
CFI	Comparative Fit Index	
CHAID	Chi-squared Automatic Interaction Detection	
CIS	Commonwealth of Independent States	
EFA	Exploratory Factor Analysis	
ERAU	Embry-Riddle Aeronautical University	
E.U.	European Union	
FSC	Full-Service Carrier	
GFI	Goodness of Fit	
НВО	Hand-Baggage-Only	
IAG	International Airlines Group	
IATA	International Air Transport Association	
IFE	In-Flight Entertainment	
IRB	Institutional Review Board	

JFK	New York John F. Kennedy International Airport	
JV	Joint Venture	
KEF	Keflavík International Airport	
КМО	Kaiser-Meyer-Olkin	
LAWA	Los Angeles World Airports	
LAX	Los Angeles International Airport	
LCC	Low-Cost Carrier	
LCLH	Low-Cost, Long-Haul	
LCSH	Low-Cost, Short-Haul	
LGW	London-Gatwick International Airport	
LHR	London-Heathrow International Airport	
LR	Likelihood Ratio	
MI	Modification Index	
MSA	Measure of Sampling Adequacy	
MSV	Maximum Shared Variance	
NAI	Norwegian Air International	
NFI	Normed Fit Index	
RMSEA	Root Mean Square Error of Approximation	
SEA	Seattle–Tacoma International Airport	
SEM	Structural Equation Modeling	
SPSS	Statistical Package for the Social Sciences	
-2LL	-2 Log Likelihood	
U.K.	United Kingdom	

- ULCC Ultra-Low-Cost Carrier
- U.S. United States
- WTP Willing to Pay
- WTS Willing/Willingness to Switch

CHAPTER II

REVIEW OF THE RELEVANT LITERATURE

The review of the relevant literature began with a brief history of the U.S. airline industry, followed by a discussion of airline business models. The importance of the trans-Atlantic market preceded a review of LCLH literature. Subsequently, the relevant literature concerning passenger choice of LCC or FSC was covered. Next, the categories from the scholarly literature that were excluded were listed, with justifications provided. Finally, gaps and inconsistencies in the literature were identified.

Brief History of U.S. Airline Industry

During the era of economic regulation of the airline industry by the Civil Aeronautics Board (CAB), U.S. airlines led a *sheltered existence*. The trunk carriers flying the longer routes were protected by the CAB, which set airfares at a level that ensured the airlines could turn a consistent profit, controlled route initiation and withdrawal, determined the number of carriers serving a route, what mergers and acquisitions could take place, and agreements between carriers were subject to its approval (Wensveen, 2011). Unable to compete on the basis of price, airlines instead enticed passengers to select them over others based upon a high level of service, gourmet food, amenities, and by boosting the number of flights (Wensveen, 2011). The impetus for deregulation of the U.S. airline industry came in 1973 with the Arab oil embargo, as airlines were adversely impacted by soaring fuel prices (Wensveen, 2011). Airfares had skyrocketed twofold to cover the increased costs that the airlines were facing, while the recession caused the demand for air travel to plummet (Wensveen, 2011). The Airline Deregulation Act of 1978 opened the door to a multitude of new entrants into the U.S. airline industry, and also set into motion a wave of industry consolidation, as many of the smaller or weaker airlines were acquired by the larger carriers (Wensveen, 2011). Airline traffic increased, due to low fares and airlines initiating new service; however, it was a losing proposition as supply far exceeded demand, which depressed revenue (Wensveen, 2011). Without the protection of the CAB, FSCs had to contend with a growing number of LCCs; and as airfares declined, air travel became an affordable means of transportation for Americans (Wensveen, 2011).

In order to compete with LCCs, multiple U.S. FSCs created their own LCSH AWAs. A litany of U.S. AWAs entered the market from 1993 to 2002, such as Continental Lite, Delta Express, Metrojet, and Shuttle by United (Pearson & Merkert, 2014). The second round included Delta Air Lines' low-cost AWA Song, which came into existence in 2003 and had planes sporting a lime green livery; it was created to compete with JetBlue on the East Coast. United Airlines used a play on words to come up with TED, which was designed to capture leisure travelers jetting off to vacation destinations; it entered service in 2004. Since the AWAs often had a higher cost structure than LCCs, they needed to generate higher revenue to compensate for their lack of cost efficiency, which was a losing proposition (Pearson & Merkert, 2014). "Like other businesses, AWAs must be created to serve a real, needed purpose—and not merely to help the parent reduce costs and losses by shifting loss-making routes onto a lower-cost subsidiary" (Pearson & Merkert, 2014, p. 25). The success rate of U.S. AWAs, which were intended to emulate a short-haul LCC, was dismal, and all ceased operations within several years (Pearson & Merkert, 2014).

FSCs were saddled with pensions and healthcare obligations, complex hub and spoke operations, served congested primary airports, had an experienced labor force on the upper end of pay scales, and also had inflexible work rules, which hampered productivity (Gillen & Gados, 2008). U.S. FSCs decided they had to trim their cost structure to be competitive—not only with LCCs, but also with FSCs that had taken advantage of Chapter 11 bankruptcy restructuring (Gillen & Gados, 2008). FSCs were "stuck in unrealistic labor contracts that were made when times were better, but were proving unsustainable in times of hardship. Bankruptcy proved to be the only way out of these and other high stakes contracts" (Harrison, Kalburgi, & Reed, 2012, p. 2). All of the U.S. legacy FSCs succumbed to bankruptcy at least once, which enabled them to reduce their cost structure and shed obligations (Harrison et al., 2012).

The U.S. airline industry has seen a tremendous amount of consolidation in the past few years, with major airlines fading into history. Recent mergers of FSCs included: US Airways and America West, which merged in 2005; Delta Air Lines and Northwest Airlines in 2009; United Airlines and Continental Airlines in 2010; and American Airlines and US Airways in 2013 (Steven, Yazdi, & Dresner, 2016). This has resulted in substantial market concentration with LCC Southwest Airlines and the three surviving FSCs (American Airlines, Delta Air Lines, and United Airlines) controlling 81% of the domestic market in 2017, leading to increasing pricing power (Statista, 2018).

FSC and LCCs alike unbundled amenities and services, rather than including them in the ticket price for short-haul routes, since they were cognizant that leisure travelers often made purchase decisions on the basis of price (De Wit & Zuidberg, 2012). Paving the way by checked baggage fees, airlines discovered that ancillary revenue could enable them to keep their fares low, while extracting the maximum amount of revenue from travelers. FSCs were able to lower unit costs and compete on the basis of price in the U.S. domestic market by taking certain measures, including increasing seating density, abolishing complimentary in-flight meals, and charging for checked baggage. Fees were added by FSCs and LCCs alike for services such as pre-assigned seats and priority boarding. The most recent development has been U.S. FSCs adopting basic economy airfares in the domestic market to compete with the likes of ultra-low-cost carriers (ULCCs) including Spirit and Allegiant; and in 2017 United and American went to the extreme of even banishing the use of overhead bin space by basic economy passengers (Josephs, 2017). In time, domestic air travel in the U.S. became commoditized, and today there is little differentiation between flying an LCC or an FSC (Daraban, 2012). The convergence of the FSC and LCC business models resulted in the unit cost gap narrowing (Dunn, as cited in Pearson & Merkert, 2014).

Airline Business Models

Although Chapter I provided a brief overview of airline business models, further elaboration has been provided in Chapter II on characteristics of full-service carriers (FSCs), low-cost, short-haul (LCSH) carriers, and low-cost, long-haul (LCLH) carriers. Furthermore, the characteristics of hybrid, all-business-class, and charter carriers were described.

Full-service carriers. Airlines known as FSCs utilize a hub-and-spoke system where regional or short-haul aircraft transport passengers from an array of smaller

airports to primary airport hubs, where passengers can then connect with long-haul flights which are typically operated with higher-capacity, wide-body jets (Wensveen, 2011). FSCs and their affiliates operate an assortment of fleet types, as a turboprop could be used to provide air service to a small community, a B737 or A320 could be used for domestic routes, a B787 to link point-to-point routes; and for high-volume, long-haul routes a B747 or A380 is considered (Wensveen, 2011). FSCs schedule flights to arrive at hubs in what are known as *waves* or *banks*, in order to facilitate connecting passengers continuing onward in their journeys without excessive layovers. FSCs establish hubs at primary airports such as LAX and New York–JFK, which are more prone to congestion and delays, longer ground times, and higher airport and facility charges. A problem such as inclement weather at a hub could wreak havoc on an FSC's operations, as it would have a ripple effect, impacting aircraft flight routings at a litany of stations. Multiple fleet types drive up cost and add complexity to an FSC's operation, as it needs to have flight crews type-rated on each aircraft scheduled to fly, and it also must provision stations with spare parts. Air cargo is an important source of revenue for FSCs, and while some carriers have dedicated freighter aircraft, spare belly space on passenger aircraft is often filled with cargo as well (Wensveen, 2011).

While FSCs already offer a comprehensive network, their global reach is further enhanced due to alliances and partnerships (Wensveen, 2011). This leads to a dog-bone shaped network, as U.S. FSCs take their domestic feeder traffic, offer long-haul service, and then—at the other end of the route—their European FSC partners offer their own localized feeder traffic (Button, 2009). FSCs have a relatively high aircraft utilization rate on long-haul routes, as even flying one flight leg in a given day could keep a jet airborne for 15+ hours (Francis et al., 2007). Since FSCs can cast a wide net to draw in demand to support their long-haul flights via their short-haul and regional affiliate operations to complement origin-to-destination demand, they are able to achieve relatively high load factors (Francis et al., 2007). However, it is difficult for an FSC to retreat from serving a market, as it has broader implications for its network, including both direct and indirect traffic (Pels, 2008).

FSCs offer multiple classes of service, which may include economy, premium economy, business, and first class, all of which could vary depending upon the market and fleet type (Wensveen, 2011). Frequent flier programs are a hallmark of FSCs, as they maintain the loyalty of their high-value frequent fliers and those who occupy the business and first class cabins (Wensveen, 2011). FSCs view their upper-class passengers on long-haul flights as lucrative sources of revenue, since they are paying thousands of dollars (Francis et al., 2007). FSCs place continued emphasis on keeping these passengers content by frequently refreshing premium cabins with state-of-the-art seats, IFE systems, and upgrading meals and service (Wensveen & Leick, 2009). Thus, these high-fare business and first class passengers subsidize the economy class passengers in the back of the jet (Francis et al., 2007). In turn, FSCs have viewed economy class travelers on long-haul flights as an afterthought, and traditionally have paid little attention to this customer base. A long-haul, economy class airfare on an FSC had traditionally been all-inclusive of services and amenities (Wensveen & Leick, 2009); which could include items such as checked and carry-on baggage, food and beverage, IFE, and a pre-assigned seat.

Low-cost, short-haul carriers. How LCSH carriers achieve their cost advantage is via operational efficiency (Francis et al., 2007). LCCs traditionally have operated one aircraft type, with short-haul Boeing B737 and Airbus A320 being fleet staples (Whyte & Lohmann, 2015). This is cost effective, since pilots could hold a common-type rating, crew scheduling and training is simplified, spare parts inventory is reduced, maintenance could be streamlined, and carriers often receive volume discounts on aircraft purchases. LCCs traditionally have operated from secondary airports, which are cheaper to operate out of, and on point-to-point routes; thus they can bypass operations at congested and delay-prone primary airports (Whyte & Lohmann, 2015). LCCs typically do not carry much cargo, catering is minimal due to buy-on-board sales, and crews often clean and ready the airplanes on turns (Francis et al., 2007). As a result, LCCs can accomplish quicker turns, which are critical for high aircraft utilization, given that a short-haul aircraft might be crisscrossing the country, and ground time really adds up with multiple short flight legs on a given day. LCCs typically have higher density seating configurations in order to lower unit costs (Francis et al., 2007). From a labor standpoint, LCC pay scales are often lower than FSC counterparts, newer carriers have more junior employees, work rules are often more flexible, they operate with minimal cabin crew, and there tends to be less unionization. LCCs are also more apt to hire contract companies to perform front line functions such as ticket counter, gate, and ground handling, which is more cost effective (Whyte & Lohmann, 2015). LCCs are able to lower travel expenditures, since with short-haul flying they strive to schedule crews to return to their domicile rather than a crew hotel at the end of their flying day. LCCs compete on the basis of airfare and are reliant on generating ancillary revenue by charging passengers for

the amenities and services they opt for (Pels, 2008). The assortment of fees varies by LCC and could include speaking with a reservations agent, checked baggage, carry-on baggage, seat assignment, extra legroom, priority boarding, Wi-Fi, movies, and buy-on-board food and beverage. Other cross-selling opportunities for revenue could include cobranded credit cards, in-flight shopping, and cross-selling travel services such as rental cars, hotels, and cruises.

While LCCs have spurred additional demand for air travel and prompted bus, rail, and car users to switch their allegiance on short-haul routes, they have also siphoned off passengers from FSCs, resulting in declining market share and yields (De Wit & Zuidberg, 2012). LCCs tended to put downward pressure on airfares in the markets they entered while boosting traffic (Daraban, 2012), with the impact so pronounced that it was termed *the Southwest effect* in honor of Southwest Airlines. Over time FSCs conceded market share, and today LCCs hold 31% of North American and 37% of European capacity (Boeing, 2017).

A recent trend has been LCCs adopting traits of FSCs, including adding business class seats, operating out of primary airports, serving international markets, and establishing hubs (Daraban, 2012). JetBlue even diverged from its Airbus A320/321 fleet commonality by acquiring the Embraer E-190 to serve smaller markets. LCCs even offer extra perks, such as JetBlue's Live TV, and Southwest established customer goodwill and loyalty with its *bags fly free* policy, refusing to charge for checked baggage.

Low-cost, long-haul carriers. Strategies that drive operational efficiency would not transfer well from LCSH to LCLH operations, where the chief cost advantage is labor (Morrell, 2008). Table 1 compares the cost efficiencies of LCSH and LCLH carriers.

Table 1

Cost Efficiency	Short-Haul LCC	Long-Haul LCC
Single Class	Usually, although not always	Multi-class, importance of front-of-aircraft yields
Seating	Cram passengers in; and there is often no pre- allocation	Comfort is more important the further you fly Need for toilets and galley; pre-allocation may be demanded
High Aircraft Utilization	Seen as crucial	Already achieved, because of longer sector lengths
Load Factor	High occupancy	Yes, potentially
No-Frills	Yes, but variations in what is offered or charged extra for	Limited by the need to offer some additional services based on flight duration
Catering	Peanuts	Long-haul passengers likely to value more highly
In-Flight Entertainment	Limited; may be charged extra	Long-haul passengers likely to value more highly
Network	Tend to start point-to-point but develop networks	Importance of hubs
Single Fleet	Yes	Yes, but range and capacity issues such that one aircraft may not be suitable for all routes
Cargo	No	Traditionally an important source of revenue
Fast Turnaround	Important	Typically less important, since aircraft spend longer in the air
Secondary Airports	Often preferred from cost and efficiency perspective	Potentially; depends on individual airport's facilities

Cost Efficiencies of Short-Haul and Long-Haul LCCs

Adapted from Francis et al. (2007).

Multiple LCLH carriers established their roots as LCSH carriers first, thus they already possessed a narrow-body B737 or A320 fleet, both of which have a limited range; thus acquiring a second fleet type such as the B767, B787, or A330 for longer routes is often

necessary (Francis et al., 2007). LCLH carriers cannot achieve quick turn times, as the aircraft take longer to load and unload—particularly for wide-body jets which often carry passenger baggage and air cargo; the flight has to be provisioned with catering; and boarding times are longer for wide-body jets (Francis et al., 2007). Since an LCLH airplane may only fly a flight leg or two per day, turn times are not as critical (Whyte & Lohmann, 2015). For long-haul flights, it can be difficult to extract higher utilization from aircraft and crews than what FSCs already achieve (Francis et al., 2007). When flying long-haul, multiple considerations limit the extent of aircraft utilization, such as slot restrictions, airport curfews which constrain the times of day available for arrivals and departures, crossing of time zones, and synchronization of short-haul and long-haul schedules to allow for connecting traffic (Morrell, 2008). Since FSCs already have high load factors on long-haul routes, LCLH carriers have limited scope to improve upon (Morrell, 2008). An LCLH carrier is more vulnerable to jet fuel price fluctuations than an LCSH carrier would be, since fuel comprises a greater proportion of operating expenses, and some carriers operate less fuel-efficient aircraft (Morrell, 2008).

It is important that an LCLH carrier achieve a cost advantage over an FSC, since this provides the mechanism for the carrier to offer its passengers low fares, because it will have lower revenue without business and first class travelers paying top dollar to subsidize the low fares for economy class travelers (Wensveen & Leick, 2009). LCLH carriers offer passengers a lower base fare, and generate ancillary revenue from amenities and services such as baggage, food and beverage, and assigned seating, which they typically offer a la carte; although LCLH carriers may offer bundled packages (Daft & Albers, 2012). LCLH carriers that are operating wide-body jets on long-haul routes often dedicate empty belly space to cargo, which is an important source of revenue, since such aircraft can accommodate palletized or containerized cargo (Francis et al., 2007). LCLH carriers typically opt for a one-class economy configuration, or a two-class configuration consisting of economy and premium economy (Francis et al., 2007). While an LCLH carrier could offer point-to-point service on routes with sufficient origin-to-destination demand, in contrast to an LCSH carrier, feeder traffic is considered essential (Francis et al., 2007).

Hybrid carriers. Airbus (2017) has noted that LCCs and FSCs have been adopting each other's traits, thus blurring the lines between carrier types:

Hybrid airline business models are also developing, particularly towards medium/long-range operations as part of growth strategies, including a desire to exploit new market opportunities and a way to effectively differentiate themselves. For example full service carriers adding cabin densification (more seats where possible) and Low Cost Carriers increasingly attracted by business markets and longer range operations. (p. 36)

This trend is becoming pronounced particularly in the trans-Atlantic market, as LCLH carriers such as Norwegian and WestJet are trying to appeal to business travelers, and FSCs are seeking to attract passengers who want a lower fare, rather than to lose them to LCLH carriers. Airbus (2017) has noted that "10 out of 30 largest airlines have an LCC in their group" and "9 out of 10 largest LCCs target business travelers" (p. 36).

All-business-class carriers. Trans-Atlantic all-business-class operators Eos, MaxJet, and Silverjet outfitted their B757/B767 aircraft with comfortable business class seats and amenities to appeal to the business traveler (Douglas, 2010). They planned to *cream skim* from the FSCs acquiring business travelers, while competing on high-density routes, including New York–London (Douglas, 2010). However, these upstart carriers were unable to offer a premium product of a caliber that would result in loyal passengers switching their allegiance and relinquishing earning their frequent flier miles in sufficient numbers to fill their airplanes (Douglas, 2010). The FSCs fiercely defended their turf in response to what Douglas (2010) calls the *head-on conflict* approach that was taken by all-business-class carriers. Soon after the 2008 oil crisis, these all-business-class carriers had folded.

However, French all-business-class carrier La Compagnie, which commenced trans-Atlantic operations in 2014 is thriving, as it offers a business class product that is three to four times less expensive than FSCs on its Newark–Paris route, and appeals to corporations that are tightening their travel budgets (Business Travel News, 2016). La Compagnie discontinued its New York–London route in order to focus on Paris, and it upped its frequency to two flights per day (Business Travel News, 2016). For frequent trans-Atlantic jetsetters, in fall of 2017 La Compagnie put 10 passes on offer for a year of unlimited business class travel for those with \$40,000 to spare (Bui, 2017).

Charter carriers. Passengers have an additional option for bargain trans-Atlantic fares, due to the offerings of charter carriers that are often linked with travel companies selling vacation packages (Morrell, 2008). The all-inclusive holiday package of a tour operator could include: "flight, hotel accommodation, meals, airport transfers, as well as providing night-time entertainment and escorted tours to places of historical and social significance" (Rodríguez & O'Connell, 2018, p. 67). From 2015 to 2017 the trans-Atlantic charter sector has seen rapid growth, with Condor seeing a 73% increase in traffic, and Thomas Cook Airlines an 151% increase in traffic (Anna Aero, 2018). Both carriers have the advantage of European feeder traffic, with Condor having a base in Cologne and Thomas Cook in Manchester (Lew, 2016). However, charter carriers are often *snowbirds* and tend to serve leisure and holiday spots on a seasonal basis, redeploying airplanes on routes when demand is sufficient to warrant service (Pels, 2008).

Trans-Atlantic Market

Traffic. Although the trans-Atlantic market is well established, passenger traffic has expanded by 47% over a 15-year timespan as shown in Figure 4 (Airbus, 2017). The Boeing (2017) 20-year market outlook is projecting a 2.9% per annum growth rate for the North Atlantic. Over the next 20 years, Airbus (2017) is forecasting that the trans-Atlantic market between the U.S. and Western Europe will have an increase of 1.8 times. The explanation that follows will detail the impact of the U.S.–E.U. Open Skies Agreement and anti-trust immunity (ATI) on the trans-Atlantic market, and why FSCs have fiercely defended their turf against LCLH entrants.



Figure 4. Passenger traffic between Europe and the U.S. Reproduced with permission from "Airbus global market forecast 2017–2036" by Airbus, 2017.

Open Skies. In 2008, the U.S.–E.U. Open Skies Agreement was formed, which abolished "restrictions on route rights, airfares, and marketing cooperation" and enabled U.S. and E.U. airlines to select the routes they wanted to serve (Morandi, Malighetti, Paleari, & Redondi, 2014). In 2011, the U.S.–E.U. Open Skies Agreement was amended to include non-E.U. member states Norway and Iceland (European Commission, n.d.). This superseded the bilateral Air Service Agreements that the U.S. had previously held with various countries within the E.U. (Wensveen, 2011). The impact of Open Skies and LCLH carriers has fueled route development in the trans-Atlantic market, and as of 2016 there were 310 routes between the U.S. and Western Europe, which is a 40% increase from 2010 (CAPA, 2016j).

"Trans-Atlantic flying is one of the most lucrative and competitive segments of the airline market in the world. Connecting financial hubs and tourist destinations in

Europe and the U.S. has been a veritable golden goose for America's major airlines" (Zhang, 2016, para. 1–2). Gillespie and Richard (2011) analyzed trans-Atlantic economy class airfare data from 2005 to 2010 to determine the impact of ATI that was granted to U.S. and European airlines and found an average fare increase of 7% for every loss of a competitor on a given route. In a subsequent paper, Gillespie and Richard (2012) noted that "recent grants of immunity to participants in international alliances, which have led to a trans-Atlantic airline industry dominated by three integrated alliances, have harmed consumers by raising prices on many routes" (p. 12). CAPA (2016a) characterizes joint ventures (JVs) with ATI as "effectively legalised internal collusion: less competition and greater pricing power" (para. 32). While JVs with ATI, which includes Oneworld, SkyTeam, Star Alliance, and Delta-Virgin Atlantic, have dominated the trans-Atlantic skies, their market share has been on a steady downward decline as shown in Figure 5. LCLH carriers, including Norwegian Air and WOW air, are not merely adding trans-Atlantic capacity; rather they are playing a pivotal role in opening up new point-to-point routes providing air travelers with more travel options (CAPA, 2016j).



Figure 5. Europe–North America market share by available seat kilometers. Adapted from CAPA, 2016a.

Low-Cost, Long-Haul Carriers

Cost efficiency. The scholarly literature provides varied estimates of the diminished cost advantage that an LCLH carrier has. Research by Francis et al. (2007) determined that while an LCSH carrier could achieve an estimated 50% cost advantage over an FSC, this diminishes to 20% for an LCLH carrier. Van der Bruggen (as cited in Wensveen & Leick, 2009) estimated that an LCSH carrier would carry a 40–60% cost advantage, but an LCLH carrier would only carry a 20–25% cost advantage over an FSC. Moreira et al. (2011) performed a cost simulation with a B767-300ER aircraft of an FSC relative to an LCC and were less optimistic at the prospects of an LCLH carrier; they

estimated that only a 10% cost advantage could be achieved over an FSC. Whyte and Lohmann (2015) noted that Boeing's generic cost model estimated that an LCLH carrier would have a 25% cost advantage over an FSC; whereas in their analysis of a B777 route from Melbourne to London, the cost model showed a 13–17% advantage for an LCLH carrier over an FSC. Joe Mohan, American Airlines VP of Alliances and Partnerships estimated that LCLH carriers hold a 30% cost advantage over FSCs in the trans-Atlantic market (CAPA, 2017c).

Low-cost labor. LCLH carriers derive their chief cost advantage over FSCs via low-cost labor (De Poret et al., 2015; Francis et al., 2007; Wensveen, 2011; Wensveen & Leick, 2009). LCLH carriers have taken measures, including staffing from low-wage countries, hiring contractors, outsourcing work, offering lower pay scales, minimizing cabin crew, and increasing flexibility of work rules (Bachman & Matlack, 2015). Doganis (as cited in De Poret et al., 2015) estimated that an LCLH carrier could achieve a 20% labor cost advantage over an FSC.

Bill McGee noted that airlines following in the footsteps of Norwegian Air have begun to "comparison shop for nations with favorable oversight rules," which supports their quest to achieve a cost advantage (Bachman & Matlack, 2015, para. 20). However, the ability to control labor costs in the trans-Atlantic market is limited, and while Norwegian Air initially staffed trans-Atlantic flights with Thai cabin crews, an outcry from U.S. carriers and labor unions led them to switch to European and American crews (Schaal, 2015). Norwegian has since established U.S. bases which are staffed with American pilots and cabin crew to appease regulators and critics (Norwegian 2017).
While U.S. FSCs extensively outsource their aircraft maintenance, call centers, and front line personnel, they do not want Norwegian achieving an advantage regarding crew costs. U.S. FSCs have limited ability to drive down labor costs due to a unionized workforce and labor contracts, thus cost savings are often only achieved via restructuring and the bankruptcy courts, which could eliminate pensions while reducing wages and benefits; thus it is unlikely they will enter the LCLH arena. AirAsia enjoys the world's lowest unit costs, primarily due to its inexpensive workforce (Moreira et al., 2011).

Air France–KLM has established an LCLH carrier named Joon, which achieves a cost advantage by offering second-tier wages and benefits for its cabin and flight crews (Landauro & Wall, 2016). While pilots transferring from Air France–KLM to Joon will receive the same salary, they are expected to work longer hours (Landauro & Wall, 2016). Air France–KLM has had tenuous relations with its employees, and there could be strife over establishment of an LCLH subsidiary, as employees possibly fear that second-tier wages might erode the benefits and workload of mainline FSC operations, threatening job and wage security. Norwegian Air's operations have led to a similar sentiment in the U.S.

Fleet choice. LCCs have traditionally operated narrow-body aircraft, with the B737 and A320 being fleet staples for short-haul flights. However, Morrell (2008) noted that LCCs expanding into long-haul flying might need to sacrifice fleet commonality, which adds complexity and cost to operations. LCLH carriers, including Cebu Pacific, AirAsia X, Jetstar, Norwegian Air, WestJet, and WOW air, have all introduced long-haul aircraft into their fleets. Wensveen (2011) mentioned that, "Although an airline can maximize its efficiency by purchasing aircraft that burn less fuel than others, fuelefficient airplanes often have much higher capital costs than do less fuel-efficient aircraft" (p. 204).

An LCLH carrier that is on a limited budget, unable to secure new aircraft in a timely manner, may be inclined to obtain aircraft via the secondary market. A parent airline may have older aircraft that could be relegated to the LCLH carrier, just as Singapore Airlines provided its B777s to launch Scoot. When fuel prices are lower, older generation aircraft including the B757/B767 and A330/A340 hold appeal and could be obtained at a bargain price. However, De Poret et al. (2015) noted that carriers with older aircraft are vulnerable to volatile fuel prices. AirAsia X found the operating costs of the four-engine, fuel guzzling A340 to be unbearable on the long-distance Kuala Lumpur to London route, and ceased serving the route in 2009 (M. R., 2014). However, multiple trans-Atlantic LCLH carriers have decided in favor of acquiring new aircraft.

Norwegian Air, along with Jetstar and Scoot, fly B787 long-haul aircraft that are approximately 20% more efficient than the B767/A330 aircraft operated by Eurowings, WestJet, and WOW air respectively (Boeing, 2018). French Bee has opted for A350 aircraft. LCLH carriers that have the financial backing and established relationships with aircraft manufacturers and/or leasing companies or via their parents often can achieve more favorable pricing with volume discounts, and can secure delivery slots on new aircraft in a prompter manner (Morrell, 2008). However, De Poret et al. (2015) studied the viability of LCLH operations in the trans-Atlantic market with a B787 and found that a modern, fuel-efficient aircraft did not hold a clear advantage, plus aircraft pricing and availability tends to be dynamic. The latest rage in the LCLH arena is the use of narrow-body aircraft to operate on the shorter trans-Atlantic routes, which was how WOW air and WestJet had their foray into LCLH. Fuel-efficient, narrow-body derivatives capable of longer-range operations have entered service, including the A320neo operated by WOW air, and the B737MAX operated by Norwegian Air. The A321LR, which took to the skies for the first time in 2018, has also been ordered by LCLH carriers. Regarding the largest narrow-bodies, the A321neoLR will feature a 4,000 nautical mile range with entry-into-service anticipated in 2019 (Airbus, 2018), whereas the B737MAX 10 will offer a more limited 3,300 nautical mile range (Boeing, 2018). Norwegian Air CEO Bjorn Kjos has noted that the B737MAX is more cost-effective to operate than the B787 for shorter trans-Atlantic routes, plus it has fewer seats to fill, which is ideal for serving secondary markets and point-to-point routes (Sumers, 2016b). Use of an aircraft such as the A321neoLR or B737MAX lowers the barriers to entry for existing LCCs, since they maintain fleet commonality.

Airfare. LCLH carriers seek to draw in passengers on the basis of low airfares, and unbundle their product so that passengers pay only for the amenities and services they choose to use (Daft & Albers, 2012). Francis et al. (2007) noted that an LCLH carrier could not price airfares more than 20% below FSCs and have a viable business plan. Anker (as cited in De Poret et al., 2015) stated that LCLH carriers would need to undercut FSCs by 30% on airfares. In the Asian market, Dewberry and Hou (as cited in De Poret et al., 2015) noted that LCLH carriers are undercutting FSCs by 32% on

airfares. However, airfares could be affected by market dynamics, competition, and whether the carrier is utilizing primary or secondary airports (De Poret et al., 2015).

In the trans-Atlantic market, Norwegian Air, WOW air, and WestJet are offering airfares at 50% below their FSC competition (Carey & Wall, 2016). Airline analyst Andrew Lobbenberg noted that "we see long-haul, low-cost carriers as a growing threat to trans-Atlantic profitability" (Carey & Wall, 2016, para. 9). Capacity has outpaced demand, which has resulted in downward pressure on per-passenger revenue (Carey & Wall, 2016). Norwegian Air CEO Bjorn Kjos (CAPA, 2014) anticipates "a price drop of up to 30 per cent compared to the prices on long-haul routes that we see today" (para. 1), thus passengers stand to be the key beneficiaries.

Demand. Proussaloglou and Koppelman (1995) state that on a passenger level, "Demand for air travel reflects travelers' decisions about their destination, their carrier preferences, their desired departure and arrival times, and their willingness to pay for different fare classes with associated service levels and travel restrictions" (p. 372). The demand for long-haul trans-Atlantic travel is inelastic and is estimated by the IATA to be -1.7 (Smyth & Pearce, 2008). Thus there is less sensitivity to pricing than would be exhibited in domestic short-haul markets, where other forms of transportation can be used in lieu of air travel. More recent analysis was performed by Skyscanner (2017) focusing on price elasticity in the trans-Atlantic market using 2016 data from routes with LCLH carriers—the demand was inelastic with the London–New York route being -.65, with the route having the lowest price elasticity being Rome–New York at -.92. Morrell (2008) theorized that with LCLH carriers, "The potential for discounting well below current low fares and for generating new markets is lower: less price-elastic markets and smaller discounts mean less passenger generation" (p. 66). Research by Wilken et al. (2016), which evaluated prospective long-haul routes from Europe that LCLH carriers could serve, provided supporting evidence, as the quantity of travelers on a specific route was "rather inelastic with regard to supply and demand characteristics" (p. 87).

However, in a broader context, Wensveen and Leick (2009) stated, "There is little evidence that lower airfares will translate into increased demand in long-haul markets as it has in short-haul" (p. 130). Francis et al. (2007) elaborated that demand for point-topoint routes flown by an airline without feeder traffic would be limited. According to Francis et al. (2007), "As much of the demand will have to come through diversion from traditional airlines, this is going to be more fiercely resisted" (p. 397). Daft and Albers (2012) anticipated that an LCLH carrier would both stimulate new demand and acquire market share from FSCs.

Norwegian Air's Chief Commercial Officer Thomas Ramdahl has determined that "about 20% of the airline's long-haul passengers are snatched from rivals. The majority are choosing European destinations in the first place because of Norwegian's low fares" (Reuters, 2016, para. 16). WOW air founder and CEO Skúli Mogensen (CAPA, 2016i) stated:

I believe there is a tremendous potential for low-cost travel to further stimulate demand between Europe and North America . . . We are not talking about taking demand from existing services, but introducing a whole new market for long-haul travel. We are already seeing this in the data from our existing routes into Canada and the United States, which are performing extremely well and securing very positive loads that are ahead of our ambitious targets. These flights are actually growing the market. (para. 1)

Figure 6 focuses on the high profile New York–London market, and it shows that there has been a 25% increase in demand on this route from August of 2013 to 2016 which is partly attributed to lower airfares, with LCLH carriers gaining in market share (Airbus, 2017).



Figure 6. London–New York traffic stimulated by LCCs and existing operators. Reproduced with permission from "Airbus global market forecast 2017-2036" by Airbus, 2017.

Feeder traffic. The concept of feeder traffic in the context of long-haul travel is explained by Wilken et al. (2016):

Only a portion of the passengers on board intercontinental flights are traveling from gateway to gateway airport. Many passengers have to use feeder flights beforehand to get to the gateway airport of intercontinental flight origin, or are continuing flights from the destination gateway airport of the intercontinental route, or both. (p. 80)

To illustrate this, suppose passengers from Glasgow, Montana; Yuma, Arizona; and Moses Lake, Washington all want to travel to London. While these locales are ideal for turning flight test prototypes into production-worthy planes, they are not exactly tourist destinations; and it is unlikely that origin-to-destination demand would be sufficient to support even low frequency service to London. Thus U.S. FSCs have a cohesive network of regional airline affiliates with puddle jumpers and mainline narrow-body jets that could transport this feeder traffic to a major hub where the passengers could connect with a long-haul, trans-Atlantic flight. Thus the origin-to-destination demand, which consists of nonstop passenger traffic, is pooled together with feeder demand that is scattered all over vast stretches of the U.S. or on the European end of the routes, in order to fill up wide-body jets and support a given frequency of trans-Atlantic service.

For LCLH carriers, feeder traffic is essential to making the business model work (De Poret et al., 2015; Fageda, Suau-Sanchez, & Mason, 2015; Francis et al., 2007; Moreira et al., 2011; Morrell, 2008; Wensveen & Leick, 2009; Whyte & Lohmann, 2015; Wilken et al., 2016). The hub-and-spoke strategy of FSCs is well suited for long-haul operations, since origin-to-destination demand can be supplemented by short-haul operations providing feeder traffic (Wilken et al., 2016). An LCLH carrier flying pointto-point without feeder traffic on an end of a route will not be able to capture non-originto-destination demand, which accounts for a substantial portion of travelers on long-haul routes (Wilken et al., 2016). However, an LCLH carrier establishing a new point-to-point uncontested route could capture demand from passengers who previously only had connecting flight options.

Wensveen and Leick (2009) noted that "high frequency connectivity to short-haul markets becomes more critical to long-haul operations, since many passengers connect on either or both ends of their long-haul flights" (p. 130). De Poret et al. (2015) highlighted the strong position that an LCC could end up in by having an established short-haul route structure, and then using that operation to feed long-haul routes. LCLH carriers AirAsia X, Cebu Pacific, Eurowings, Jetstar, Norwegian Air, Scoot, and WestJet all have short-haul traffic, either internally or via a sister or parent carrier, used to a varying extent to provide feeder traffic and support demand for long-haul routes.

Through establishment of a hub and long-haul crew base at London–Gatwick, Norwegian Air is able to leverage its short-haul network to provide feeder traffic. LCLH carrier Cebu Pacific is in favor of passengers self-connecting, where they develop their own itinerary and purchase separate tickets from more than one carrier. Cebu Pacific CEO Lance Gokongwei stated, "We find our passengers have learned how to self connect. If that means adding several hours to an already lengthy journey, then so be it" (M. R., 2014, para. 4).

Even with a short-haul operation, bidirectional feeder traffic is difficult for an LCC to obtain, since air rights can be restricted in foreign markets or an airline may not wish to establish a short-haul route structure. None of the independent European LCLH carriers have feeder traffic from the U.S., due to logistics and regulatory issues—such as

with foreign carriers not being allowed cabotage rights in the U.S. to carry passengers between domestic points (Button, 2009). Particularly vulnerable would be an unaffiliated LCLH carrier without a short-haul operation or relation to a mainline carrier parent company, such as French Bee or World Airways; and a carrier in such a predicament might need to align itself with other carriers in an alliance or partnership (CAPA, 2018e; De Poret et al., 2015; Wensveen & Leick, 2009).

An LCLH carrier without feeder traffic could be constrained regarding route selection, since it would need to operate in markets that are able to support point-to-point service, such as low-frequency leisure routes to locales similar to the Florida market, or opt for high-density routes in larger catchment areas like New York to London (De Poret et al., 2015). While Norwegian Air and WOW air do not have feeder traffic on the U.S. end of their routes, this has not proven to be a great hindrance, because there has been sufficient origin-to-destination traffic either in large catchment areas, or due to their offering low-frequency service to leisure spots. Furthermore, deployment of pint-sized, narrow-body aircraft on shorter trans-Atlantic routes could negate the need for U.S. feeder traffic for Norwegian Air and WOW air. If European LCLH carriers seek to keep growing their trans-Atlantic flight offerings and expanding their reach into more U.S. markets, forming a partnership or alliance with a U.S. LCC could expedite the process. Feeder traffic on U.S. ends of routes for LCLH carriers would emulate the successful approach of FSCs and provide sufficient demand to support expansion of trans-Atlantic routes and flights (Wilken et al., 2016).

Kloeg and Schaal (2014) note that both connectivity and feeder traffic are the advantages of a hub-and-spoke network, which is used by FSCs versus a point-to-point

route structure, which has been favored by LCCs. Kloeg and Schaal (2014) interviewed European airline executives and consultants, where 67% of respondents stated that a point-to-point strategy would not be a viable alternative for an LCLH carrier. In regard to the reasons given, 80% noted that there were not enough markets with adequate volume, 40% referred to strong competition, while 30% mentioned seasonality (Kloeg & Schaal, 2014). It was noted by Daft and Albers (2012) that a "variety of untapped markets exist that offer significant point-to-point demand without dedicated feeder traffic" (p. 53). Norwegian Air and WOW air have both seized the opportunity to establish new point-to-point routes that have been uncontested.

Partnerships and alliances. While Norwegian Air is a member of Airlines 4 Europe Alliance, cooperation has yet to be seen in the trans-Atlantic market for independent LCLH carriers on the U.S. ends of routes. Since cabotage rights are not granted to foreign carriers—they could benefit by aligning themselves with a U.S.-based LCSH carrier. LCLH carriers forming partnerships with U.S. carriers would put trans-Atlantic travel more within reach for U.S. travelers and would broaden the destinations that travelers from abroad could choose from within the U.S. This partnership could result in capturing market share of passengers with domestic connections to trans-Atlantic flights. The U.S. partnering carrier would also be able to offer its passengers continuing service to destinations in Europe. Norwegian CEO Bjorn Kjos stated that JetBlue "would be a natural if we wanted an alliance with somebody in the U.S." (Reed, 2013, para. 11). Norwegian Air operates trans-Atlantic flights out of New York, Massachusetts, Florida, and California airports, where JetBlue has a strong presence. Codeshare agreements "allow the expansion of airline networks and flight frequency" (Morandi, Malighetti, Paleari, & Redondi, 2015, p. 185). Morandi et al. (2015) offer statistics regarding 2011 data from 93 LCCs. Regarding codesharing, 27% of LCCs were engaged in this practice, excluding the codesharing performed by affiliate companies. Morandi et al. (2015) noted that LCCs with a multi-class cabin configuration and, at least two aircraft types, operating in dense networks and facing intense competition in markets, were more apt to codeshare.

Although FSCs have long formed partnerships, LCCs viewed each other as rivals in competing markets, or as immaterial due to substantial geographical separation. Wensveen and Leick (2009) noted that "long-haul, low-cost carriers represent an opportunity for LCCs everywhere to join forces and compete with the global alliances" (p. 133). LCLH carriers Scoot and Cebu Pacific are part of the newly formed Value Alliance in the Asia-Pacific market, which features LCCs in localized markets providing them with feeder traffic (CNBC, 2016). The blend of LCSH and LCLH flying could create a cohesive interconnected system for LCC operations, without substantial overlap of route structure.

Cabin density and configuration. The first configuration an LCLH carrier could opt for is a single-class, high-density configuration. Whyte and Lohmann (2015) favored a single-class configuration, since "costs could be distributed over a greater number of passengers which has the effect of reducing the unit cost per passenger" (p. 163). This approach is supported by Pels (2008), who notes that passengers would be willing to forgo legroom, since a high-density seating configuration has been successfully utilized

by charter companies. Morrell (2008) favors single-class, high-density seating to bolster productivity, because it spreads operating costs over a greater number of seats. Filipino carrier Cebu Pacific has embraced an all-economy class, high-density configuration for its aircraft (M. R., 2014). However, with 10% of the Filipino population living overseas, Cebu Pacific is catering to migrant workers, who might be more tolerant of a dense seating configuration in order to obtain an extraordinary low airfare (M. R., 2014). WOW air opted for a single-class configuration for its A320/A321 fleet, since those aircraft are deployed on its shortest trans-Atlantic routes; although for its A320neo WOW air is offering seats which feature additional pitch (SeatGuru, 2018). Norwegian Air also opted for a single class configuration for its 186-seat B737MAX 8.

The second configuration an LCLH carrier could opt for is a two-class configuration. Wensveen and Leick (2009) stated that "it is very difficult to achieve a fare advantage with an all economy seating configuration in long-haul markets" (p. 131), since business and first class passengers cross-subsidize the cheap economy class fares. Thus Wensveen and Leick (2009) consider a two-class cabin to be essential for an LCLH carrier. Douglas (2010) is a proponent of a carrier offering a premium economy product to increase revenue and attract passengers who want a low airfare with more comfort. De Poret et al. (2015) determined that for a trans-Atlantic operator flying the B787, a highdensity, two-class seating configuration with flights of longer stage lengths (London– Gatwick to LAX rather than Manchester to Newark) was the most viable option, due to it lowering the break-even load factor relative to the moderate-density configuration. Furthermore, the operating profit and threshold where fuel prices would result in a loss were both substantially higher for the high-density configuration (De Poret et al., 2015). A two-class seating plan has proven to be popular with LCLH carriers, as it serves to satisfy passengers who want a low fare, and also draws in passengers who are willing to pay more for a premium economy offering. As a point of comparison, for LCLH carriers with a B787-8 two-class configuration, Norwegian Air has a 291-seat, moderate-density configuration; whereas Jetstar and Scoot have opted for a high-density, 335-seat layout (SeatGuru, 2018). In comparison with the A330-300, WOW air offers a two-class, 342-seat configuration; AirAsia X features a two-class, 377-seat configuration; whereas 436 passengers are squeezed into Cebu Pacific's one-class configuration (SeatGuru, 2018).

IAG CEO Willie Walsh noted that 10-across seating on B777 aircraft will be rolled out in 2018, enabling British Airways to "lower the average cost per seat, charge a lower price, and stimulate demand" (Calder, 2016, para. 4). The impact of a higherdensity configuration on unit costs is illustrated by Air Canada, which has made the transition to a high-density, economy-class configuration with acquisition of its B777-300ER aircraft, which resulted in cost per available seat mile declining by 21% to operate this aircraft (Ranson, 2014). American and United Airlines are other FSCs that are already operating B777s in a 10-across configuration (Martin, 2017).

Amenities, comfort, and fees. Ancillary revenue has grown in importance for LCCs and FSCs alike. Wensveen and Leick (2009) stated that "cutting frills on long-haul flights would only alienate passengers who find more value in in-flight entertainment, meals, and seat pitch on longer flights" (p. 130). Francis et al. (2007) shared a similar sentiment and questioned whether a modest decline in airfare would compel long-haul passengers to switch from an FSC to an LCLH carrier, sacrificing comfort and amenities.

This is supported by Whyte and Lohmann (2015), who believe that an LCLH carrier needs to offer economy class passengers an air travel experience commensurate with that of an FSC.

Ancillary revenue could ostensibly be lower for a long-haul carrier, with passengers expecting a higher level of service and amenities included in the ticket price over longer stage lengths; and with a lower volume of passengers, there will be fewer selling opportunities (Kloeg & Schaal, 2014). According to Airbus (2017), airlines are earning approximately 30–40% of their ancillary revenue from cabin sources. However, in an opposing viewpoint, Daft and Albers (2012) remarked that if LCLH carriers took an a la carte approach to meals, IFE, or extra legroom, demand for services and amenities could be increased on a per-passenger basis, as they would be more inclined to make these purchases given the increased flight duration. Norwegian Air's CCO Thomas Ramdahl stated that "many passengers just want a quick and efficient flight, so they shouldn't have to pay for extras that they don't want or need," which enables the carrier to offer lower fares (Simson, 2016, para. 18). However, a passenger lured by a low airfare may find the litany of fees while flying an LCLH carrier unavoidable and surprising. WestJet CEO Gregg Saretsky stated "there's a bit of re-education that needs to happen" to recalibrate the expectations that passengers have of LCLH carriers, and noted that passengers "need to do the math," since they could still come out ahead, even after paying for all of the extra services and amenities (Belfast Telegraph, 2016, para. 4– 5). WestJet claims that, "This a la carte or user-pay approach allows us to keep our fares low. It's been part of our DNA for 20 years, and it doesn't change because we are now flying long-haul flights across the Atlantic" (Ip, 2016, para. 5).

LCLH carriers have taken to upselling passengers, offering seats with extra legroom or a premium economy class. "For long-hauls, especially, value is critical as one has 6–14+ hours to be miserable if one selected price over value. But 'almost everyone' is okay being miserable for an hour or two on a short flight" (A. Bender, personal communication, February 16, 2016). Given that Norwegian Air's premium economy product is attracting business travelers (Garcia, 2016), a subset of passengers could find both the price point and value of an LCLH carrier appealing, relative to the offering of an FSC.

It is apparent that U.S. domestic travelers are willing to endure greater discomfort for a low fare, given the emergence of ULCCs such as Spirit, which features a dense seating arrangement and is often termed *the Dollar Store of the sky*, where even overhead bin space, a cup of water, or a printed boarding pass carry a price tag (Nicas, 2012). However, WOW air's A330s, utilized on longer trans-Atlantic routes, are configured with additional seat pitch to enhance comfort relative to its narrow-body fleet. Airline consultant Bob Mann stated that "WOW gets it—you can't do Spirit service on nine-or-10-hour routes" (Reed, 2016, para. 3).

Lending support for the rationale that the stage length of a flight could affect the perceptions of LCLH passengers, Jetstar Group CEO Jayne Hrdlicka noted, "If it's a 15-hour flight or a 13-hour flight, well then, you'll probably want a full-service experience. You're probably more prone to pay a bit more for that. But when you're looking at anything from a five to 10-hour flight, I think it's a good experience" (Sumers, 2016a). Morandi et al. (2014) say that the few service features characterizing LCCs are not

adequate for long-haul passengers' needs, due to their sensitivity not only to price but also to in-flight services, timing, and routing.

Competition. An LCLH carrier has to weigh the tradeoffs of competing in dense markets dominated by FSCs that are resistant to market entry and trying to cream skim and take market share, with establishing uncontested point-to-point routes that often have weaker demand and so feature lower flight frequencies and target leisure travelers (Wilken et al., 2016). Douglas (2010) champions a *head-down competition* approach for LCLH carriers, such as offering premium economy in lieu of a business-class product, and having a limited presence in competitive markets. An LCLH carrier will have easier entry and exit from markets and can be more agile than an FSC, since it has less interdependency with its network and route structure (Pels, 2008). While some LCLH carriers may opt to take on FSCs head-to-head in their home markets, Wensveen and Leick (2009) noted that others may steer clear of conflict and employ methods like creating new point-to-point service on uncontested routes, or establishing operations at secondary airports. In the trans-Atlantic market, LCLH carriers have grown emboldened, and are eager to challenge FSCs in their key markets and hubs.

Revenue. Pels (2008) notes that LCLH carriers are able to reduce profits of FSCs and take away their customers and also reduce load factors, cutting into margins. Although the lucrative revenue stream of premium passengers would be untapped, having the LCLH competitors siphoning off economy class travelers might put a dent in the profits of FSCs (Morrell, 2008). CAPA (2017e) estimated that "WOW air's average revenue per seat in 2016 was 20% to 30% below that of Icelandair, its main competitor, in spite of its having an average trip length that was 10% to 15% longer" (p. 3).

Airports. While FSCs primarily operate long-haul routes out of hubs at primary airports, LCLH carriers are seeking out secondary airports due to the lack of slot restrictions, lower costs, and less competition; and such airports are often eager to attract international air service (De Poret et al., 2015).

Passenger Choice Literature

The existing scholarly research has extensively examined passenger choice of carrier. Proussaloglou and Koppelman (1995) developed a model shown in Figure 7 to reflect how passengers choose their air carrier. *Carrier Market Presence* consists of flight network and total originating flights; *Level of Carrier Service* details frequency of origin-to-destination service and scheduling of flights; *Quality of Carrier Service* details with image, on-time reliability, terminal, and on-board amenities; and *Carrier Pricing* refers to fare levels by fare-class and seat-allocation rules. While this dissertation does not replicate the framework set forth by Proussaloglou and Koppelman (1995), it serves as a guide to understanding how the different impact variables or factors in the literature could fit into the broader decision-making process of carrier choice.



Figure 7. A conceptual framework for carrier choice behavior. Adapted from Proussaloglou & Koppelman, 1995.

Appendix A contains a Summary of Passenger Choice Literature table which consists of a synopsis of the existing passenger survey research and key findings. The most relevant content will be noted to provide support for the selected passenger choice categories. While some studies focused exclusively on demographic and trip characteristics of travelers, other studies took into consideration impact variables or factors related to passenger satisfaction, which could affect choice of carrier. Each passenger choice category will be discussed in turn based upon the existing scholarly literature.

Demographic characteristics. Researchers surveying airline passengers often collect data on demographic characteristics such as gender, age, education level, income,

nationality, and geographic region. Demographic characteristics could be of relevance for several reasons:

- → This data could be useful in characterizing how the demographics of the sample compare with the broader population.
- The data could help explain how demographic characteristics influenced passenger choice, or determined if passengers of varying demographic characteristics responded differently to the survey questions.
- → The data could help confirm or refute the results of existing studies regarding what, if any, demographic characteristics were of relevance.
- → The data collected could support future research, if passenger choice survey research of LCLH versus FSC was replicated in the Asia-Pacific or another geographic region.
- The varying demographic characteristics of passengers could result in findings from studies not being generalizable to a broader population, so it is important they are identified.

O'Connell and Williams (2005) determined that in the European and Asian markets, age had an impact on passenger choice of carrier, with younger travelers preferring an LCC and older travelers an FSC. O'Connell and Williams (2005) also found that "while there are differences between passengers traveling on a low-cost carrier and those on a full service airline, there appears to be no difference in the attitude and perception of passengers from two very different continents" (p. 271). However, Gilbert and Wong (2003) found that Japanese travelers "have relatively higher expectations of various service dimensions" than travelers of other nationalities (p. 524). This is consistent with Japan having a service-oriented culture that surpasses what passengers of other nationalities often expect. Sultan and Simpson (2000) determined that nationality affected service quality perceptions of a trans-Atlantic flight, as European passengers were more critical of the service quality than U.S. passengers were.

Castillo-Manzano and Marchena-Gómez (2011) found that gender, age, and education level did not influence choice of LCC or FSC for Spanish travelers. Research by Thanasupsin et al. (2010) found that Thai passengers with lower income gravitated to LCCs, whereas those with higher income were more likely to choose an FSC; although age did not influence passenger choice. Ong and Tan (2010) determined that travelers in Malaysia who had a higher level of education were more likely to choose an FSC. Jiang (2013) surveyed LCLH passengers flying AirAsia X (independent) or Jetstar (AWA of Qantas) and determined that income, education level, nationality, and trip purpose did not impact their evaluation of service quality. Balcombe et al. (2009) found statistically significant differences in willingness to pay for comfort and in-flight service on the basis of age, income, gender, and education level.

The demographic characteristics selected for inclusion in the survey instrument were a core group of five characteristics (gender, age, education, income level, and nationality), which have been listed in the aforementioned studies (Balcombe et al., 2009; Jiang, 2013; Kurtulmuşoğlu et al., 2016; Ong & Tan, 2010; Yeung et al., 2012). Additionally, the geographic region that respondents resided in was included in the survey.

Trip attributes. Researchers surveying airline passengers have taken into consideration trip-related attributes, such as purpose of trip (business or leisure), frequent flier program membership, frequency of air travel, direct or connecting flight, destination, travel distance to airport, length of stay, travel on a weekend or midweek, booking method, and who paid for the airfare. Frequent fliers and those with long-term stays were more willing to choose an LCC (Castillo-Manzano & Marchena-Gómez, 2011). Research by Park (2007) lends support to inclusion of a variable to consider how frequency of air travel could affect what impact variables or factors determine selection of air carrier, as statistically significant differences were found in both the Korean and Australian markets. The impact variables or factors that affect business or leisure traveler choice of carrier are often divergent; thus trip purpose is essential. However, many of the existing studies lump leisure travelers into a single category and do not differentiate by other categories such as students, vacationers, or those visiting friends and relatives. Gilbert and Wong (2003) noted that visiting friends and relatives travelers were least demanding and most price-sensitive. The following trip/traveler attributes were included in the survey: airline flown, origin/destination airports, fleet type, class of service, time since flight was taken, trip purpose, frequent flier program membership, and frequency of air travel.

Airfare. Airfare is the base price that a purchaser needs to pay an airline for air transportation, which is inclusive of compulsory taxes, fees, and surcharges (Kyriazopoulos & Samanta, 2012). The airfare is for a specified airline, flight numbers, dates of travel, routing, and class of service (Wensveen, 2011). One of the key criterions

for passenger choice of an LCC is airfare (Kurtulmuşoğlu et al., 2016; Mikulić & Prebežac, 2011; O'Connell & Williams, 2005; Ong & Tan, 2010; Thanasupsin et al., 2010; Yeung et al., 2012). Airfare has also been one of the prime reasons for leisure traveler choice of carrier, due to price sensitivity (Alamdari, 1999; Lu & Tsai, 2004; Proussaloglou & Koppelman, 1995, 1999). Min and Min (2015) noted that airfare was the third priority for U.S. passengers surveyed.

Airfare has been deemed unimportant for business travelers' choice of carrier by multiple studies (Alamdari, 1999; Lu & Tsai, 2004; Proussaloglou & Koppelman, 1995, 1999). Corporate travel policy often mandates economy class travel for short-haul flights, thus explaining why existing scholarly research has given attention to the topic of passenger choice of LCC or FSC for business travelers. Mason (2001) surveyed business travelers and found that those who opted for an LCC were more concerned with airfare than those who opted for an FSC. Fourie and Lubbe (2006) did not find a statistically significant difference regarding the importance of airfare for business class travelers who chose an LCC or FSC in South Africa, as airfares tended to be comparable. Since companies typically fund air travel for those on business trips, Huse and Evangelho (2007) determined that airfare did not even warrant consideration regarding choice of LCC or FSC for business travelers. While Norwegian Air's premium economy could draw in business travelers and particularly those who are self-employed or work for companies with limited travel budgets, business travelers who work for large corporations are often authorized for business class travel for international long-haul flights. Therefore, it is anticipated that survey respondents flying long-haul economy class will be predominantly leisure travelers.

Wensveen (2011) noted that "the higher fares associated with long-haul travel make price a more critical criterion in the purchase decision" (p. 501). Jiang (2013) found that AirAsia X and Jetstar passengers expressed satisfaction with airfare, and noted it as one of their top three priorities. Trans-Atlantic passengers would need to consider the extra fees they would pay on an LCLH carrier and to factor that into the airfare purchase decision; when comparing with an FSC offering. Kurtulmuşoğlu et al. (2016) determined that economy class passengers preferred flying an LCC that offered the option to purchase additional services and amenities they deemed important, versus an LCC without such options.

There is often great disparity in what passengers on a given flight will have paid in airfare. While WOW air may tout its \$99-each-way airfare, few if any passengers will be able to obtain it. Proussaloglou and Koppelman (1995) asked passengers to rate their satisfaction with airfare, and used this as a proxy for what they might have paid. Proussaloglou and Koppelman (1995) further elaborate on airfare pricing:

Fare levels vary by origin-destination city pair, carrier, and fare class while fare class availability depends on the demand by fare class, timing of ticket purchases, and seat allocation rules employed by each carrier. Thus, even in markets where carriers typically match their competitor's fares, travelers may be faced with different fare levels by carrier depending on seat availability by fare class. (pp. 375–376)

O'Connell and Williams (2005) evaluated cross-price elasticity of passengers in both the European and Asian markets. LCC passengers were asked by what percentage an FSC would have to lower its airfare for them to switch to an FSC; whereas FSC passengers were asked by what percentage an FSC would have to raise its airfare for them to switch to an LCC (O'Connell & Williams, 2005). The greatest proportion of passengers willing to switch occurred with a fare difference of 30%, although it was noted that many passengers remained loyal to their chosen carrier, with 28% of LCC Ryanair passengers pledging allegiance (O'Connell & Williams, 2005). A key finding from the study was that it "defies the usual assumption of constant cross-price elasticity and shows the importance of absolute fare levels in determining customer choice" (O'Connell & Williams, 2005, p. 269).

Seat comfort. Comfort is "a pleasant state of physiological, psychological and physical harmony between a human being and the environment or a subjective sense of wellbeing" (Vink, Bazley, Kamp, & Blok, 2012, p. 354). Seat comfort is a subjective determination, thus each passenger could perceive elements of it differently, such as legroom, seat [width, cushioning, support, headrest, recline, armrests], or the aircraft cabin [newness, cleanliness, personal space, cabin altitude, humidity, noise, lighting, ambience] (Vink et al., 2012).

It is not the imagination of travelers that airline seats are getting smaller. In the 1970s prior to deregulation, airlines vied for passengers by offering comfort, as they could not compete on price. Thus the average seat width was 18 inches and seat pitch was 35 inches; whereas today the average seat width is 16.5 inches and seat pitch is 31 inches, although thinner seatbacks account for some of the shrinkage (Morris, 2016). The impact is further intensified by the percentage of seats filled, or load factor on flights trending upward as capacity is more in line with demand, which Moss, Ryan, and Moss

(2016) have associated with a decline in Airline Quality Rating for U.S. domestic airlines.

Representative Steve Cohen put forth the Seat Egress in Air Travel Act of 2016, which was voted down (Rosenbloom, 2016). Senator Chuck Schumer also proposed a bill to regulate seat size, which failed to garner sufficient support (Morris, 2016). Senator Schumer claims that "the average passenger feels like they're being treated as a sardine" (Rosenbloom, 2016, para. 7). However, passengers cannot have it both ways, and a tradeoff has to be made, as increased seating density lowers unit costs and provides the mechanism for lower fares. It is now commonplace for travelers to have the option to spend a bit more to upgrade to a seat with extra legroom, width, or personal space; and many airlines now offer a premium economy product.

Vink et al. (2012) determined that the type of aircraft flown matters in terms of passenger perceptions, as a newer plane was deemed to provide superior comfort compared to an older one; and when an adjustment was applied for stage length, a wide-body aircraft was deemed to have greater comfort than a narrow-body airplane. Boeing has developed the *Personal Space Model*, which accounts for 60% of comfort being seat pitch and seat width; and the cabin being widest at 48 inches, which makes it feel the most spacious (Hewitt, n.d.). In what Boeing has dubbed the *Middle Seat Factor*, the key element that influences passenger comfort is an unoccupied adjacent seat (Hewitt, n.d.).

One of the most overlooked impact variables or factors for passenger choice of LCC or FSC is *comfort*. A compelling reason for this is that passenger survey research has been predominately focused on short-haul markets. Boeing's research, conducted in support of B787 cabin design, determined that while comfort was not a priority for short-

haul passengers, it was deemed one of the most important criteria for long-haul passengers (Emery, 2010). Comfort did not affect passenger choice of LCC for shorthaul flights in the European and Malaysian markets (O'Connell & Williams, 2005) or in the Thai market (Thanasupsin et al., 2010). Kurtulmusoğlu et al. (2016) found that passengers on Turkish short-haul domestic flights considered seat space to be of lower importance. Whereas Chen et al. (2008) determined that Taiwanese students considered comfort one of the most important factors when taking a long-haul flight. Mintel (as cited in Hugon-Duprat & O'Connell, 2015) determined that seat comfort was of prime importance to U.K. economy class, long-haul travelers with related elements ranking: [1] legroom, [3] choice of seat, and [6] wider seats. This is further supported by Lu and Tsai (2004) and Vink et al. (2012), who noted that comfort is of increased importance to passengers on long-haul flights. Fourie and Lubbe (2006) found that in South Africa comfort was important to both LCC and FSC passengers. In the Taiwan market, Lu and Tsai (2004) discovered that business travelers placed greater importance on comfort than leisure travelers, whereas Alamdari (1999) had the opposite finding. Since the existing literature suggested that a passenger's need for comfort increases with flight duration, data was collected from both LAX and SEA Airports to survey passengers who had taken longer trans-Atlantic flights.

Demographics also play a role in passenger evaluations of comfort. Balcombe et al. (2009) determined that older travelers or those with a higher income level were more willing to pay for comfort on a medium-haul flight. Balcombe et al. (2009) found a negative correlation between seat pitch (legroom) and seat width, with men preferring seat pitch and women seat width. However, gender is also a proxy for the height of

passengers—with men preferring legroom, as they tend to be taller. While Cebu Pacific utilizes high density seating, it is notable that the average height of a male in the Philippines is 5 feet $4\frac{1}{2}$ inches (Disabled World, 2018). Whereas, Norwegian Air is transporting predominately European travelers, and men who hail from countries such as Denmark or Norway have an average height of 6 feet (Disabled World, 2018). Vink et al. (2012) found that taller passengers have lower perceived comfort than shorter passengers. Since the average height and stature of passengers tends to vary by nationality and geographic region, the perceptions passengers have of comfort could explain what has prompted LCLH carriers in various air markets to configure their aircraft cabins so differently in regard to seating densities and classes. Yeung et al. (2012) determined that lack of seat comfort was one of the prime reasons that LCC passengers had aversions to choosing an LCLH carrier, as comfort is more critical to passengers on long-haul flights. Vink et al. (2012) said that comfort affects passengers' willingness to choose their respective airline for a future flight, and that legroom most affected perceptions of comfort.

Flight convenience. "The convenience of a service is a judgment made by consumers according to their sense of control over the management, utilization, and conversion of their time and effort in achieving their goals associated with access to and use of the service" (Farquhar & Rowley, 2009, p. 434). A passenger choosing an airline for a trans-Atlantic route might consider multiple aspects that affect flight convenience, including flight departure and arrival times, flight frequencies, travel time, connections, nonstop service, and primary versus secondary airports. Chen et al. (2008) equated the

experience of taking a long-haul flight to purchasing a car tire, as both are necessary to get from point A to B; however, they are a *negative purchase* and are not particularly a fun-filled experience, unless the passenger is an aviation enthusiast. Chen et al. (2008) noted that a student chose an airline on the Taipei to London route on the basis of price, stating:

It took me over 24 hours. I had to transfer four times to London. I almost went crazy during the trip. Since then, I do not like to spend too much time on a flight which has too many transfer points even if the ticket is cheap. (p. 156)

Yeung et al. (2012) found that in Hong Kong, passengers considered a nonstop flight to be higher priority than flight/timetable schedules for LCLH travel.

Suzuki (2004) discovered that both business and leisure travelers preferred "more direct services, and fewer flight miles in the routes they fly" (p. 33). This reduces total travel time, the chance of checked baggage getting lost, or missing a connecting flight. However, convenience often comes with a steeper price, as airlines typically charge more for nonstop flights at desirable times. Passenger choice of an LCC in Spain was negatively influenced by a passenger having connecting flights (Castillo-Manzano & Marchena-Gómez, 2011). Chang and Sun (2012) found that in the Taiwan–China market, passengers who prized punctuality or who were older had a preference for nonstop rather than connecting flights. Traveling on WOW air requires a compulsory stop in Keflavík, Iceland, which adds a few hours of travel time to a trans-Atlantic journey. However, for passengers flying between North America and Keflavík, WOW air could offer greater convenience, since it is the only carrier with nonstop service on certain routes. Ong and Tan (2010) found that passengers were more likely to choose

LCC AirAsia over FSC Malaysia Airlines if they considered schedule convenience to be important, thereby demonstrating that FSCs are not always the most convenient, and that localized market conditions need to be taken into account, as well. For example, Nagar (2013) found that in the Indian market where LCCs and FSCs had comparable flight schedules, passengers perceived them to be nearly equivalent regarding convenience.

Wilken et al. (2016) determined that if a passenger had a choice, they would opt for a connecting flight with an array of flight options similar to what an FSC might offer, over a nonstop flight that operated only once or twice in a given week—which is what an LCLH carrier might tender on a thin route or in a leisure market. Min and Min (2015) noted that U.S. travelers prioritized a smooth connecting flight over nonstop flights and flight schedule. Proussaloglou and Koppelman (1995) found that carrier market presence and schedule convenience positively influenced passenger choice of carrier, and both tend to be FSC strengths. FSCs typically base their trans-Atlantic flights out of major hubs located at primary airports with large catchment areas and offer passengers connecting service from smaller markets to their hubs.

Proussaloglou and Koppelman (1999) also found that market presence affected passenger choice, and noted that business travelers were more impacted than leisure travelers by an airline not offering flight departure times that coincided with their preferences. Mason (2001) discovered that for U.K. business travelers flying an LCC or FSC on short-haul flights, flight frequency is important—as this enables them to minimize their travel time and select the flights that best suit their needs. Fourie and Lubbe (2006) found that South African business travelers flying an FSC considered schedule and flight frequency to be of greater importance than those flying an LCC. Alamdari (1999) mentioned that schedule/timetable was more important for business than leisure travelers. Lu and Tsai (2004) had the opposite finding in the Taiwanese market, as schedule/timetable was more important for leisure passengers than business travelers. Park (2007) found that Australian and Korean economy class passengers deemed flight schedule and nonstop flight availability their fourth priority. Kurtulmuşoğlu et al. (2016) learned that for Turkish short-haul routes neither flight frequency nor flight schedule were a key criterion for passenger choice of LCC or FSC. Mikulić and Prebežac (2011) found that flight frequency was important to FSC passengers but not LCC passengers. Gilbert and Wong (2003) had a similar finding in the Hong Kong market as flight schedule, nonstop flights, and alliance partner network were only of moderate importance. O'Connell and Williams (2005) asked passengers what their prime reason was for choice of carrier, and those flying an FSC more frequently cited flight schedule or connections than did LCC travelers.

Norwegian Air offers connections on the European ends of its routes that are unparalleled compared with the offerings of U.S.-based FSCs; however, they leverage their alliance partners' networks in Europe. WOW air CEO Skuli Mogensen noted that the carrier is "seeing a lot of self-connectivity, primarily from the U.S." due to online travel websites like Kayak that are able to create itineraries linking together WOW air flights and FSC and LCC flights (CAPA, 2016g, para. 50). Connecting flights are not necessarily a detriment to choice of an LCC in the trans-Atlantic market, particularly since long-haul travelers not living in large catchment areas may not have a nonstop flight option, regardless. Whether an LCLH or FSC offers the most convenient option could be dependent upon the passenger's origin and destination and how that individual evaluates various aspects of scheduling, plus the issue of time sensitivity.

Safety perception. Safety perception is the extent to which passengers perceive their chosen air carrier as safe. Ringle, Sarstedt, and Zimmermann (2011) noted that it is difficult for a passenger to be able to objectively evaluate the safety of a chosen airline:

Even though passengers are aware of the general efforts to make air travel safe, they are hardly able to assess factual safety levels. They therefore resort to proxy measures of safety.... Consequently, these encounters strongly shape passengers' perceptions of safety. (p. 460)

A modern aircraft with a well-maintained interior could lead to positive perceptions of safety, whereas an airplane which has been neglected and has a sad and tired interior could make passengers feel uneasy (Ringle et al., 2011). Security measures at an airport, and whether they are stringent or lax, could also affect perceptions of safety (Ringle et al., 2011). A passenger's knowledge of an airline's ranking or service quality could affect safety perceptions, since that person might equate good service quality with good safety (Rhoades & Waguespack, as cited in Ringle et al., 2011).

While aviation accidents or high profile emergency landings can make fearful fliers wary of air travel, remarkable improvements in safety have been made with each successive decade. Advances in commercial aviation include airplanes equipped with terrain warning systems, traffic collision avoidance, human factors, pilot training, fatigue mitigation, aircraft and engine design, aircraft maintenance, flight deck instrumentation, and automation (Allianz, 2014). Aviation accidents are a rare occurrence today, and an

airline passenger in the U.S. or E.U. has a one in 29 million chance of being fatally injured (Allianz, 2014). Hunter and Lambert (2016) noted that "most of the anxiety and fear surrounding flying stems from the perception that flying is unsafe or that chances of surviving a crash are slim" (p. 37). Other concerns that may make passengers wary of taking to the skies, include the 9/11 terrorist attacks where airplanes were utilized as weapons, missiles bringing down aircraft, flight crew or fellow passengers with nefarious intentions, and mysterious disappearances of airplanes. Airports have been made targets, and even a passenger walking through a terminal could be in harm's way.

Passengers considered safety one of the key criterions for choice of carrier within the following studies conducted in Asia (Chen et al., 2008; Gilbert & Wong, 2003; Lu & Tsai, 2004; Yeung et al., 2012); Australia (Jiang, 2013); Europe (Mikulić & Prebežac, 2011); and the U.S. (Min & Min, 2015). Thanasupsin et al. (2010) noted that 10% of LCC and 17% of FSC passengers in Thailand cited safety as their primary reason for choosing their carrier, as air travel is replacing surface modes of transportation and is considered a safer alternative. While O'Connell and Williams (2005) found that safety was not a key criterion for passenger choice of Malaysia Airlines or AirAsia, given the loss of two Malaysia 777s in 2014, it is expected that if the survey were replicated today, safety would be of prime importance. An interviewee who was a passenger on a Taipei-London route responded to being told that their chosen airline had multiple fatal accidents by stating, "I could not believe that I chose ... just because of the cheap tickets. I think other services are not important compared to life. Nothing is more important than life itself' (Chen et al., 2008, p. 156). O'Connell and Williams (2005) also found that safety was of little importance for passenger choice of Aer Lingus or

Ryanair; however, both carriers have stellar safety records. This is consistent with the research of Kurtulmuşoğlu et al. (2016) in the Turkish market where passengers ranked flight safety a distant 23rd place regarding decision criteria for choice of carrier. It is not known if safety concerns are more prevalent in Asia, since the researchers tended to include this impact variable or factor in their studies more often than in Europe. However, the results of passenger survey research suggest that perceptions of safety could be influenced by geographic region, safety record of individual airlines, and recency of airline accidents.

Yeung et al. (2012) found that LCC passengers were more concerned with safety on long-haul flights, and safety concerns could make them inclined to not choose an LCLH carrier. While Jiang's (2013) research also noted safety as a prime concern, LCLH passengers on AirAsia X and Jetstar indicated their agreement with a statement that they felt safe flying with their chosen airline.

Hunter and Lambert (2016) conducted the Airline Passenger Safety Perception Survey and found that post-9/11 air travelers felt safer. However, Hunter and Lambert (2016) discovered gender and age differences, as men had higher perceptions of airline flight safety than women, and younger passengers had higher perceptions of safety than older passengers. Hunter and Lambert (2016) also say that airline personnel could play a pivotal role as "perceptions of friendly airline service had a positive relationship with both perceptions of airline safety and the perception of how well prepared employees are to handle safety threats" (p. 47). Ringle et al. (2011) found that perceived safety had a positive impact on customer satisfaction for leisure travelers; however, a relationship was not found for business travelers.

Reliability. Reliability is "the airline's ability to perform the promised service [air transportation] dependably and accurately" (Pham & Simpson, 2006, p. 4). The reliability of an airline could be evaluated by criteria such as on-time performance (punctuality), if connections are made, whether passengers arrive at their intended destinations as promised, and whether baggage is received in a timely manner. Reliability has been found to be one of the primary reasons for passenger choice of FSCs in Asia and Europe, yet was of little importance to LCC passengers (O'Connell & Williams, 2005). Reliability was considered one of the key reasons for Australian and Korean passenger choice of FSCs (Park, 2007). Punctuality was seen as the most important criterion for FSC passengers in Thailand (Thanasupsin et al., 2010). Punctuality was the aspect of reliability that Turkish travelers considered to be of the highest importance, as well (Mikulić & Prebežac, 2011). Kurtulmuşoğlu et al. (2016) determined that punctuality was second in priority for Turkish passenger choice of an LCC or FSC. Looking at the Hong Kong market, reliability was considered second priority (Gilbert & Wong, 2003).

Mason (2001) found that punctuality was the chief concern of business travelers in the U.K. when choosing an LCC or FSC. Alamdari (1999) said that business travelers prioritized reliability and punctuality when determining choice of carrier. Lu and Tsai (2004) had the opposite finding, as Taiwanese business travelers ranked punctuality as their second-to-last priority. Interestingly, Proussaloglou and Koppelman (1995) noted punctuality as the prime concern for frequent fliers. Not surprisingly, Proussaloglou and Koppelman (1999) found that business travelers had the most adverse effects from delays. Business travelers often have tight schedules, and schedule interruptions could impair their ability to carry out work responsibilities.

Studies utilizing SERVQUAL have consistently concluded that reliability was the most important dimension for passengers in the trans-Atlantic market (Pham, 2011; Pham & Simpson, 2006; Sultan & Simpson, 2000) and for airline and travel managers in the long-haul South African market (Lambert & Luiz, 2011). After all, the core mission of an airline is to transport passengers from origin-to-destination. However, since SERVQUAL emphasizes service quality constructs, it is not known where reliability would place in relative importance to a broader set of categories that affect passenger choice, such as airfare, comfort, or amenities, which were not considered.

FSCs generally operate trans-Atlantic flights from airports where they have a substantial presence or a hub. FSCs often have significant resources at their hubs, including maintenance personnel, spare parts, tooling, and even spare aircraft. If an FSC experiences a technical issue with an airplane, it can substitute another aircraft onto the route, utilize a spare aircraft, or if the flight is cancelled it could reach out to alliance partners to accommodate its passengers on other flights.

Multiple LCLH operators started up operations with a handful of aircraft, spreading themselves thin by commencing low-frequency operations on multiple routes; and it proved to be a systemic driver of operational woes, particularly when a technical glitch impacted operations. Norwegian Air had a stormy entry-into-service with its B787 Dreamliners. While the initial route-proving on its European Dream Tour resulted in seamless performance of its first B787 (Sonja), the initiation of trans-Atlantic service and *teething pains* of the second aircraft (Thor) joining the fleet proved to be troublesome. Thor experienced multiple technical difficulties, leading to prolonged groundings with a Hi Fly A340 being substituted onto routes. Technical difficulties at outstations, which only had a flight or two a week, resulted in passengers getting stranded on multiple occasions for days at a time waiting for the plane to be fixed, leading to high profile schedule interruptions and passengers voicing discontent on social media (Moores, 2016). WestJet acquired second-hand B767 aircraft from Qantas for its trans-Atlantic operations, which were prone to technical glitches, marring its reliability record and driving increased expenditures for passenger compensation and wet leasing, which included replacement aircraft and crew (CAPA, 2016b). Lufthansa's Eurowings, which transitioned from LCSH to only LCLH operations in 2015, initially operated two A330 aircraft serving eight long-haul destinations and also was afflicted with operational woes; and in January 2016, one third of its long-haul flights were either delayed or cancelled (Clark, 2016). In time, the dispatch reliability of all three LCLH carriers improved, and operational snafus were ironed out.

LCLH carriers are often less inclined to take care of their passengers when a technical or operational issue occurs than an FSC would be; thus if passengers do not purchase trip insurance, they could be without recourse. Another impact to reliability could come from the aggressive flight schedule that LCLH carriers often hold, such as Scoot's 335-seat B787-8 with turn times as short as 60 minutes, making an on-time departure at a busy airport difficult even in the best of circumstances. While FSCs already have high aircraft utilization, LCLH carriers may try to eke out more utilization, which causes schedule pressure. As a result, an LCLH carrier could find it difficult to have sufficient downtime to clear up deferred items such as cabin defects and perform
routine maintenance; with less slack in the schedule. Yeung et al. (2012) noted that Hong Kong respondents considered punctuality third priority for an LCSH flight; however, it slipped to fifth priority for an LCLH flight. Conversely, Jiang (2013) determined that AirAsia X and Jetstar passengers marked reliability as one of their top three priorities.

Suzuki (2004) determined that prior service failures including seat denials, flight delays, or baggage mishandling did not affect a passenger's choice of carrier in the Midwestern U.S. However, the research of Suzuki (2004) may not be generalizable, and passengers could be less forgiving in other air markets where they have a greater choice of carrier than in central Iowa.

Service quality. Service quality refers to "passengers' overall impressions of the relative quality of airlines and their services" (Park, 2007, p. 238). A passenger's experience with an airline begins with a search for flights, booking of the trip, and extends to check-in, aircraft boarding, in-flight contact with the cabin and flight crew, and post-flight experiences with deplaning and baggage collection. Inconsistency was noted, as certain studies distinguished the concepts of service or quality, whereas others considered service quality as one concept. While in-flight service quality was the primary focus, some studies centered on the airline employees providing the service, such as cabin crew, or focused on other aspects of the air-travel experience, namely reservations or baggage service. Thus service will be considered in a broader context, for the purpose of the literature review. SERVQUAL was not discussed, since it divided service quality into specific dimensions that were not considered for this dissertation.

Service was not deemed a key criterion in multiple studies (Alamdari, 1999; Kurtulmuşoğlu et al., 2016; Lu & Tsai, 2004; Mason, 2001; O'Connell & Williams, 2005; Yeung et al., 2012). Alamdari (1999) noted that in-flight service was more important to business than leisure travelers. Whereas Lu and Tsai (2004) had the opposite finding, with in-flight service being more important to leisure than business travelers. Proussaloglou and Koppelman (1999) noted a relationship between service quality and a passenger's choice of carrier. Mason (2001) found that U.K. business travelers who chose an FSC valued service more than those who chose an LCC. Thanasupsin et al. (2010) found that Thai travelers who prioritized service were more likely to choose an FSC than an LCC.

Yeung et al. (2012) concluded that service quality was of low priority in Hong Kong; however, it was deemed more important for LCLH than LCSH travel. Differences in perceptions of service quality were found on the basis of nationality. Sultan and Simpson (2000) found that Europeans had higher expectations for service quality than U.S. citizens. Norwegian Air took top honors in the Skytrax (2017) World's Best Long-Haul, Low-Cost Airline and Best Low-Cost Airline in Europe categories, and also won top honors via AirlineRatings (2016) as the best European LCC of 2017.

Brand image and reputation. "Brand image is the result of the companies' communication efforts and of the reality experienced by the passenger when he or she travels" (Forgas et al., 2010, p. 232). Another definition was provided by Kyriazopoulos and Samanta (2012):

The brand image is a set of connections. The connections create value for the brand as they help in the collection and process of information, they differentiate the brand, they create a reason for purchasing and they create positive attitudes and emotions. (p. 250)

Companies with strong brand image are often recognizable simply by their symbol, such as the Nike swoosh, the Apple missing a bite, McDonald's golden arches, Target's bullseye, or Aer Lingus' shamrock. However, research has shown that airline image is not a key determinant for passenger choice of carrier, as it was deemed of low or moderate importance (Alamdari, 1999; Lu & Tsai, 2004; Park, 2007; Yeung et al., 2012). Chiou and Chen (2010) found that LCC passengers in China claimed that passenger satisfaction and service perception positively affected airline image. Mikulić and Prebežac (2011) surveyed Croatian passengers, for whom FSC service quality held a greater influence than price on airline image; service quality and price had comparable impact on airline image for LCC passengers; and airline image influenced loyalty of LCC and FSC passengers. According to Chen et al. (2008), Taiwanese students taking longhaul flights had excellent recall of the airline they chose for their prior flight and were cognizant of which airline they liked best.

Negative brand perceptions can adversely affect airlines. Perzanowski (2010) noted that "when a brand suffers from strong negative consumer perceptions, it transforms from a valuable asset to a major liability. Faced with the reality of an irreparably damaged brand, many firms understandably seek a fresh start" (p. 2). Airlines have been known to distance themselves after accidents using techniques like *unbranding*, which ValuJet did after having a fatal crash in the Everglades, after which it proceeded to become AirTran (Perzanowski, 2010). Likewise, Germanwings' pilotinduced plane crash in the Alps resulted in its transformation to Eurowings.

For Norwegian Air, its brand image and reputation are positive in Europe, considering that it is the third largest LCC and has garnered industry-wide recognition. However, its image has been tarnished by protectionist U.S. airlines and labor unions that have portrayed the airline in an unfavorable light with their deny NAI campaign, including picketing at the White House with signs alleging sweatshop labor and other unsubstantiated claims.

However, there can be positive connotations for brand image. Since WOW air is headquartered in Iceland and it is a relatively new airline, it is less well known; however, its \$99 introductory airfares have generated buzz, thus the media has proven to be a costeffective marketing tool. Scoot, the LCLH AWA of Singapore Airlines, wanted to stand out from the competition. With Scoot, former CEO Campbell Wilson worked at crafting a distinct culture dubbing the attitude of employees *Scootitude*, a quality he described as "an attitude to be positive and uncompromising on safety and efficiency, yet not afraid to do things differently, and see things from another perspective. It's also about not forgetting to be a little quirky . . . and have fun" (Bates, 2012, para. 14–15). Scoot has a ritual of adorning each B787 Dreamliner, painted a taxicab shade of yellow swirled with white, with her name (i.e. Scootalicious, Maju-lah, Dream Start). Since U.S. ULCC Spirit opted to copy Scoot's color theme and similar advertising/branding, Scoot opted to name a plane Inspiring Spirit and flew a blimp over company headquarters in Florida. While Scoot does not exude luxury like its parent, Singapore Airlines, its edgy approach definitely makes it stand out amongst the litany of LCCs.

Entertainment. Entertainment provided to passengers while airborne dates back to the 1930s and "included live singers, musicians, and fashion shows" (Kelly, as cited in Alamdari, 1999, p. 204). Even today, live entertainment can be found in-flight—as Southwest Airlines employs cabin crew with acting, singing, and stand-up comedy skills. It used to be commonplace for cabin crew to hand out decks of playing cards to passengers, embossed with the airline's livery and pictures of its aircraft.

In-flight entertainment (IFE) systems initially were "overhead distributed services" with large screens or TV-style monitors placed throughout the cabin, where all passengers watched the same programming (Alamdari, 1999, p. 203). Modern-day IFE packages are "video and audio systems which are installed in the back or the armrest of individual seats" and often feature on-demand viewing (Alamdari, 1999, p. 203). IFE systems offer an array of entertainment options depending upon the airline, and they may include movies, sports, news, TV shows, airline-specific programming, music, shopping, games, flight information, and food and beverage ordering (Alamdari, 1999). Northwest Airlines paved the way by installing in-seat IFE systems in 1998, and today they are commonplace, particularly on modern long-haul aircraft (Alamdari, 1999). However, drawbacks to the in-seat IFE system, include acquisition costs, out-of-service time for an aircraft if IFE is installed post-delivery, added weight to the aircraft, maintenance and upkeep of the system, passenger discontent when the IFE system malfunctions; and if the airline charges for IFE, difficulty in making it a profitable venture (Alamdari, 1999).

The existing passenger survey literature has deemed IFE of lower importance relative to other impact variables or factors that affect passenger choice (Alamdari, 1999; Chen et al., 2008; Fourie & Lubbe, 2006; Kurtulmuşoğlu et al., 2016). While Alamdari (1999) determined that "IFE is not one of the crucial factors affecting their choice of airlines, they appreciate it during the long-haul flights," with movies being the primary draw for passengers (p. 206). Jiang (2013) found that LCLH AirAsia X and Jetstar passengers rated the IFE system as the criterion with which they had the least satisfaction. Norwegian Air's B787s feature a state-of-the-art IFE system that is installed in both premium economy and economy, which enables passengers to order food and beverages from their seats. Thanasupsin et al. (2010) found that LCC passengers were less satisfied than FSC passengers with IFE. Gilbert and Wong (2003) discovered that nationality impacted passenger expectations for IFE, as Japanese and Chinese passengers were more demanding than those from North America or Western Europe. Balcombe et al. (2009) noted that younger travelers or men showed a preference for IFE. However, today's air travelers board flights well equipped with electronic gadgets of their own, including laptops, cell phones, tablets, and hand-held gaming devices to provide them with entertainment on a long-haul flight. This means that power ports for USB and laptop devices are highly coveted. IFE merits consideration with this dissertation, since it is a differentiator with Norwegian Air and most FSCs offering it, whereas WOW air does not. Furthermore, passengers have come to expect complimentary IFE from FSCs on long-haul flights.

With travelers wanting to stay connected while airborne, in-flight Wi-Fi has become one of the hottest trends, allowing passengers to connect their personal electronic devices. As of 2016, in-flight Wi-Fi service was offered by 74 airlines (Airbus, 2017). The Honeywell Aerospace Connectivity 2016 Survey of 1,008 travelers stated that 21% had switched their choice of carrier in favor of one with better Wi-Fi, 45% would switch if their carrier offered inferior Wi-Fi, 68% consider whether an airline offers Wi-Fi when booking a flight, and 90% expect a speedy Wi-Fi connection throughout their flight wherever they fly to (Future Travel Experience, 2016a). Furthermore, the Honeywell survey found that younger travelers prioritized Wi-Fi, which fits with this demographic having grown up with Internet access and personal electronic devices (Future Travel Experience, 2016a).

However, in-flight Wi-Fi has not been without criticism, as it is often sluggish, not robust enough to handle multiple users, its high bandwidth activity can be restricted; and with ground-based systems Wi-Fi coverage is not available at lower altitudes (Topham, 2016). British Airways, Delta, and Virgin Atlantic are rolling out 2Ku which is a super-fast, satellite-based system via Gogo, offering 70Mbps speed, which will probably alleviate such concerns and allow passengers to download larger files and stream from websites, making it possible to watch movies, TV shows, and listen to music (Topham, 2016). Gogo envisions Wi-Fi connectivity of 200Mbps with advancements in its satellite-based service (Future Travel Experience, 2016b). IAG CEO Willie Walsh stated that "fast Wi-Fi could likely see the eventual end of wired-in seat-back entertainment on planes" if passengers opt in favor of their own content (Topham, 2016, para. 13). Qatar Airways VP of Customer Experience, Rossen Dimitrov, stated:

With services such as Netflix and Amazon becoming the norm in terms of media consumption, it is imperative for airlines to offer a similar experience on board. People want more choice, and binge watching—having a full season, or even better, all seasons, of a popular TV series available—is now an expectation. (Future Travel Experience, 2016c, para. 10) **Food and beverage.** Airlines often offer food and beverage that is provisioned on the flight, and may either be provided as complimentary, or buy-on-board—where the passenger purchases food and beverage prior to or during the flight (Balcombe et al., 2009). Food options could range from a single serving of a light snack, box with an assortment of snack foods, sandwich, or a hot meal. Airline food is notorious for being inedible and is often the subject of comic relief. Meal service on U.S. domestic flights for economy class passengers has been mostly replaced by buy-on-board options consisting of snack foods and light meals. However, it was considered a given that on a long-haul flight an FSC would provide complimentary food and beverage. Stated preferences research by Balcombe et al. (2009) noted that passengers would be willing to forgo a complimentary meal in exchange for a lower airfare.

Facing increased competition from LCLH carriers, British Airways has implemented a cost-cutting measure of replacing the second meal that was served on trans-Atlantic flights with a light snack (Pisa, 2016). As a passenger commented, "It was a joke. I paid £500 for a World Traveller Plus seat and the breakfast was OK but to then get just a fun size chocolate bar six hours later is outrageous" (Pisa, 2016, para. 6). With U.S. FSCs plotting to compete with LCLH carriers on the basis of price, complimentary food and beverage could be rendered obsolete.

U.S. passengers considered complimentary food and beverage to be of low priority (Min & Min, 2015). Kurtulmuşoğlu et al. (2016) determined that food and beverage was not important to Turkish passenger preference of air carrier. Thanasupsin et al. (2010) determined that in the Thai market FSCs excelled at food and beverage; however, perceptions were unfavorable for LCCs. Fourie and Lubbe (2006) noted that in-flight meals and beverages were low on the list of priorities for business travelers in South Africa, although those flying an FSC deemed it more important than those flying an LCC. Chen et al. (2008) wrote that Taiwanese students on long-haul flights considered the quality of meals to be of some importance.

Frequent flier program. A frequent flier program is "an air carrier program that allows frequent fliers to earn free tickets after accumulating a certain number of miles flown on the carrier" (Wensveen, 2011, p. 543). Frequent fliers who earn status on a given carrier get additional perks, such as an elite check-in counter, expedited security screening, lounge access, priority boarding, preferred seats, and complimentary upgrades. In the 1970s, Southwest Airlines found a way to win the allegiance of business travelers on the Houston–Dallas route by offering a free bottle of liquor if they were willing to pay the full \$26 fare, or giving them the option to pay a \$13 fare (sans liquor) which Texas International and Braniff were charging (LA Times, 1988). This experiment by Southwest Airlines demonstrated that business travelers could be incentivized for their loyalty, even if it meant that their choice of flight was not the most cost-effective option for their employer. In 1981, American Airlines pioneered the first frequent flier program in order to generate loyalty amongst business and other travelers who frequently took to the skies, and they have been a staple of FSCs ever since (Wensveen, 2011).

Proussaloglou and Koppelman (1995) determined that members of a frequent flier program who travel often are particularly loyal to their given carrier, as these travelers are incentivized to achieve higher tiers of status and often get to personally reap the rewards. Furthermore, Proussaloglou and Koppelman (1995) found that when a given airline had more than a 30% share of the market, it resulted in travelers being more engaged in a given frequent flier program as they would derive other benefits such as a broader network, flight frequency, and available routes to choose from. Proussloglou and Koppelman (1999) and Suzuki (2004) discovered that being an active member of a particular airline's frequent flier program increased the likelihood of a passenger choosing that airline.

Business travelers flying an FSC considered frequent flier programs more important than those who flew on an LCC in the U.K. (Mason, 2001) and South African (Fourie & Lubbe, 2006) markets. Huse and Evangelho (2007) studied Brazilian business travelers and determined they constitute two subgroups coined luxury-loving, who cared about an frequent flier program, and no-frills, who were so thrifty they would opt for a red-eye flight if it meant saving a few dollars on a hotel room. Alamdari (1999) determined that while a frequent flier program was deemed low priority, business travelers considered it more important than leisure travelers. Lu and Tsai (2004) found that in the Taiwanese market both leisure and business travelers viewed frequent flier programs as equally low in importance. O'Connell and Williams (2005) wrote that European and Malaysian passengers flying an FSC considered a frequent flier program to be moderately important, and those flying an LCC did not deem it to be important at all.

Yeung et al. (2012) noted that Hong Kong passengers considered frequent flier programs their lowest priority for an LCSH or LCLH flight. Min and Min (2015) said that U.S. travelers deemed frequent flier programs their second to last priority. Kurtulmuşoğlu et al. (2016) determined that frequent flier programs had no impact on Turkish passenger choice of LCC or FSC. Frequent flier programs are not limited to FSCs, as LCLH carriers WestJet and Norwegian Air both offer them while WOW air does not. Gilbert and Wong (2003) found that frequent flier programs were more of a concern for North Americans and Western Europeans, as expectations were lower for Japanese and Chinese.

Excluded impact variables or factors. Impact variables or factors from the reviewed passenger survey research have been excluded from consideration due to the following reasons: (a) latent constructs associated with SEM could not be measured directly (i.e. perceived value, trust, loyalty, capability); (b) SERVQUAL dimensions which were too ambiguous; (c) immaterial to passenger choice (i.e. holiday package, parking discounts, airport facilities); (d) tangential (i.e. internet booking option, website, method of payment); (e) focused on business travelers (i.e. business class lounge, company policy for airline selection, flexibility of booking changes); (f) only relevant to subset of travelers (i.e. student discounts, facilities for those with special needs); or (g) service failures (i.e. baggage mishandling, alternative flight arrangement for missing flight, follow-up on service failures, complaint handling). Several impact variables were only applicable to a subset of travelers depending upon the airline flown or if they had used particular amenities/services, which is described further in Chapters III and IV.

Research Gaps

The emphasis for this dissertation was on economy and premium economy trans-Atlantic passengers who had flown an LCLH or an FSC. Multiple gaps in the existing passenger choice literature have been identified:

- → Lack of LCLH passenger survey research.
- → The existing literature on passenger choice of LCC or FSC has not been found to include long-haul markets.
- → While a pattern has emerged from the literature review regarding which impact variables or factors were generally most or least important to passengers, studies still had inconsistent findings. Since prior research has not been found on LCLH versus FSC choice, that warrants inclusion of a broader set of impact variables or factors.
- → Passenger choice research reflects the dynamics of localized air markets such as competition, airfares, scheduling, flight frequency, market presence, route structure, and flight networks, plus demographic characteristics and trip attributes of the passengers (Proussaloglou & Koppelman, 1995). As a result, the external validity and generalizability of passenger choice studies to other populations and air markets is often lacking.
- Multiple passenger research studies have established a factor structure, including the SERVQUAL scale (Parasuraman et al., 1988); Brazilian business travelers placed into luxury-loving and no-frills classifications (Huse & Evangelho, 2007); service quality dimensions for passengers in the Korean and Australian markets (Park, 2007); passengers on cross-strait flights between Taiwan and China (Chen & Chao, 2015); U.S. air travelers (Min & Min, 2015); and post-9/11 airline flight safety and airline employee preparedness (Hunter & Lambert, 2016). However, a common factor structure has yet to be found for LCLH and FSC passenger survey research.

Summary

The scholarly literature has been examined to identify impact variables from each passenger choice category, in order to guide survey question development. A core set of trip and traveler characteristics, Likert scale variables, and demographic characteristics have been identified as pertinent based upon the scholarly literature. Chapter III will discuss the survey methodology and will provide details pertaining to the content of the survey instrument.

CHAPTER III

METHODOLOGY

The purpose of this dissertation was to perform passenger survey research on the basis of authentic experiences of air travelers who had flown an LCLH or an FSC on a trans-Atlantic flight. This chapter will discuss the research approach, airport selection process, survey mode, survey pre-testing, pilot testing, surveyor training, survey location, data collection procedures, population/sample, sampling method, sample size, data collection device, instrument reliability, instrument validity, and treatment of the data.

Research Approach

Research design. The chosen methodology was survey research. Although survey research is an indirect way of evaluating a passenger's experience, it is a generally accepted method for performing research pertaining to passengers. Survey research was the appropriate methodology to utilize, since the data needed originated with passengers directly, and the majority of questions were closed-ended to support the chosen statistical methods and quantitative analysis (Vogt, Gardner, & Haeffele, 2012). Due to the recency of the LCLH business model and the fact that airline passenger data was tightly held and not publically available, an archival method was not appropriate. Stated preferences survey research—where a respondent is presented with several hypothetical airline trips as though an air traveler and chooses various amenities, services, comfort levels, and fares—was disregarded, due to the artificiality. Surveying actual airline passengers based upon their trans-Atlantic flight experiences was the best option to address the aforementioned research questions contained in this dissertation. **Overview.** The dissertation research process is shown in Figure 8. The first step was developing the dissertation proposal and survey instrument. The second step was seeking airport and ERAU IRB approvals. The third step was conducting the pilot study and revising the procedures and survey instrument accordingly. The fourth step was performing the full-scale survey. The fifth step was analyzing the data and writing Chapter IV Results. The sixth step was writing Chapter V Discussion, Conclusions, and Recommendations.



Figure 8. Dissertation research process.

Airport selection. The selected airports for the trans-Atlantic passenger survey were Los Angeles (LAX) and Seattle–Tacoma (SEA) International Airports. The reasons that these airports were chosen were the following: [1] Longer trans-Atlantic routes originating from the West Coast were most representative of LCLH, thus selection of West Coast airports was ideal. [2] Airports had both LCLH and FSC trans-Atlantic flights. [3] Approval from airports could be obtained to survey passengers in the airside departure lounge area. Boeing colleagues reached out to contacts at Los Angeles World Airports (LAWA) and the Port of Seattle, who graciously granted approval. Since the researcher held an LAX Airport badge with escort privileges, LAWA granted approval for the escorting of a second surveyor to help collect data. At SEA, the Director of Airport Security for the Port of Seattle provided a letter each day to grant clearance through the security checkpoint and to survey airside passengers unaccompanied.

Los Angeles International Airport. On the basis of passengers transported, LAX was ranked second in the U.S. and fourth in the world in 2016, with 81 million passengers transported, which represented growth of 8% in comparison to the prior year (Airports Council International–North America [ACI-NA], 2017). The four runways at LAX handled 697,138 aircraft movements in 2016 (ACI-NA, 2017). Nonstop passenger service from LAX was offered by 76 airlines to 172 destinations (CAPA, 2017a). LAX had a mix of 30% international and 70% domestic capacity, and market share was 27% LCCs and 73% FSCs (CAPA, 2017a). At LAX, the airlines comprising the big three airline alliances—Oneworld, Star Alliance, and SkyTeam—held 65% of the system-wide capacity (CAPA, 2017a). For the week commencing October 9, 2017, LAX had a departing weekly frequency of 203 flights to Europe with 63,839 seats offered, and had nonstop service to 22 destinations (CAPA, 2017a). Six airlines offered nonstop trans-Atlantic service in between LAX and London, with Figure 9 showing market share on the

basis of one-way departing seats by airline for the week commencing on August 27, 2017, with 22,691 available seats (CAPA, 2017a). WOW air offered 2,429 one-way departing seats from LAX to Keflavík and was the sole airline serving that route (CAPA, 2017a).



Figure 9. Market share LAX to London, week of August 27, 2017. Adapted from CAPA, 2017a.

Seattle–Tacoma International Airport. On the basis of passengers transported, SEA was ranked ninth in the U.S. and 28th in the world in 2016, with 46 million passengers transported, which represents growth of 8% in comparison to the prior year (ACI-NA, 2017). The four runways at SEA handled 412,170 aircraft movements in 2016 (ACI-NA, 2017). Nonstop passenger service from SEA was offered by 28 airlines to 108 destinations (CAPA, 2017a). SEA had a mix of 12% international and 88% domestic capacity, and market share was 11% LCCs and 89% FSCs (CAPA, 2017a). The big three airline alliances—Oneworld, Star Alliance, and SkyTeam—held 38% of the capacity (CAPA, 2017a). For the week commencing October 9, 2017, SEA had a departing weekly frequency of 61 flights to Europe, with 15,841 seats offered, and had nonstop service to seven destinations (CAPA, 2017a). Three airlines offered nonstop, trans-Atlantic service in between LAX and London, with Figure 10 showing market share on the basis of one-way departing seats by airline for the week beginning October 1, 2017, with 6,260 available seats (CAPA, 2017a).



Figure 10. Market share SEA to London, week of October 1, 2017. Adapted from CAPA, 2017a.

Airport traffic. As shown in Figure 11, traffic at LAX, SEA, London–Heathrow (LHR), London–Gatwick (LGW), and Keflavík (KEF) builds from spring to peak season, which is summer, when there tend to be numerous vacationers and leisure travelers, and then declines, with a slight uptick during the fall and winter holiday seasons. The winter months tend to be the off-peak season, when traffic falls off.



Figure 11. Traffic by airport from 2014 to 2017. Adapted from CAPA, 2017a.

Survey mode. A mixed-mode design was utilized, since some passengers were asked to complete the survey in-person, while others provided their email address to be sent a link to an online survey to complete post-flight, which provided a benefit in that it resulted in higher response rates (Groves et al., 2009). A web/tablet-based survey offered several advantages, in comparison to a traditional paper survey. First, this eliminated the data entry burden and errors that could be associated with interpreting written responses and manually inputting data. Second, although screening questions were asked of passengers, disqualifying logic served as a secondary check and was set up to ensure that passengers who did not consent to the survey, were under 18 years of age, or who were business or first class passengers and not part of the sampling frame were unable to take

the survey. Third, skip logic was set up to direct LCLH and FSC passengers to questions customized to their choice of carrier, along with contingency questions. This made the survey more user-friendly and ensured that respondents answered only the questions that were applicable to them. Fourth, the surveyor did not need to manually review the surveys prior to submission to check for errors or completeness, which was more timeefficient and put the passengers at ease, since sensitive demographic questions such as age and income were asked of them. SurveyGizmo could detect if a passenger skipped a question, which at times occurred unintentionally, particularly with the matrices for the Likert scale questions; or if the survey was incomplete. This provided the respondent the opportunity to fill in the missing responses at their choosing. Fifth, the iPad provided a discrete way of collecting demographic data from those who said they would participate in the post-flight survey, rather than verbally asking questions and notating their responses. Sixth, acquiring post-flight survey respondent contact information and establishing an email campaign provided a means for the researcher to be cognizant of who had not yet taken the survey and the ability to send follow-up reminder emails, which boosted the response rate. Seventh, a web-based survey enabled real time monitoring of in-person and post-flight survey results to track progress.

Survey pre-testing. Initial pre-testing of questions was done by eliciting general feedback from those who had prior air travel experience and were willing to review the survey. In order to refine the instrument, feedback was also sought from those with survey research expertise. Final feedback was gathered from several individuals who had recently taken a long-haul flight for which they could complete a survey. When the

questionnaire was reviewed, comments were made on the following: wording of questions, ease of understanding, ambiguity, double-barreled questions, biased or leading questions, duplicated or overlapped questions, negatively phrased questions, double negative questions, time frame for questions requiring recall of information, ordering of questions, contingency questions, skip pattern, formatting and layout of questionnaire, completeness of closed-ended question responses, measurement scales, survey length, and time to complete questionnaire (Ruel, Wagner, & Gillespie, 2016). In the latter stages of survey development, extensive feedback was obtained on the survey when input into SurveyGizmo software to ensure that it was user friendly and displayed well on various personal electronic devices, including laptops, tablets, and smartphones.

Survey pilot testing. The pilot testing served several purposes: dry run of survey conduct procedures, sampling plan, response rate, data collection rate, refinement of survey questions, and data to perform statistical analyses (Ruel et al., 2016). Please refer to Chapter IV for specifics on the airlines from which passengers were surveyed, sample size, demographics, instrument reliability and validity, and survey instrument and procedures. What was learned from the pilot test, which led to improvements for the full-scale survey, will also be discussed.

Surveyor training. The researcher was involved in approaching every passenger who was surveyed, and had assistance from a second surveyor for nearly half of the full-scale survey data collection process. Several hours of training were provided to the second surveyor regarding understanding airport policies for access to the secure airside

departure lounge areas, using iPads with SurveyGizmo software, understanding questionnaire items, approaching potential respondents, informing them of the survey incentive, collecting data on non-respondents, and expressing gratitude for participants' cooperation.

Survey distribution location. Passengers were approached while waiting in the airside departure lounge area for pre-selected trans-Atlantic flights. A clear advantage of this location was passenger convenience, considering the idle-time factor while waiting to board a flight (Biggs et al., 2009). However, a disadvantage was that nearly all of the passengers were engaged in some form of activity while waiting at the gate (i.e. reading, eating, talking, sleeping, working, listening to music, playing video games, web surfing, utilizing electronic devices, caring for children, doing schoolwork, etc.); so each surveyor had to judge whether or not to interrupt a particular passenger. Trans-Atlantic passengers typically began arriving about 1.5 to 2.5 hours prior to the scheduled departure time, and the boarding process typically commenced 45 to 60 minutes prior to departure; thus the window of time for data collection was limited. Surveying was completed prior to aircraft boarding commencing, in order to be respectful of airline operations.

Data collection procedures. Passengers approached were told that the surveyor was a Ph.D. student at ERAU surveying passengers about their trans-Atlantic air travel experiences for a dissertation. Passengers not interested in taking the survey were thanked for their time, and the surveyor moved on to the next passenger with the intent of giving each passenger an equal chance of being included. With receptive passengers,

screening questions were asked to determine if they were part of the sampling frame: their airline, destination (Keflavík or London), class of service (economy or premium economy), and if they were at least 18 years of age (Biggs et al., 2009; Brace, 2013). Passengers who met the aforementioned criteria were asked if they would be willing to participate and take a survey about their trans-Atlantic flight experience, which had an estimated completion time of 10 minutes. A survey incentive was also mentioned, as Ruel et al. (2016) noted that offering an incentive typically generated goodwill and improved survey response rates.

In-person survey. Passengers who had already taken a trans-Atlantic flight from Europe to North America and were preparing to embark on their return flight completed the survey in-person while waiting in the airside departure lounge area. The survey was self-administered by respondents utilizing surveyor-provided iPads loaded with SurveyGizmo software. The initial display screen consisted of the participant letter, which explained further details of the study in accordance with IRB requirements, and by consenting to it, they proceeded on to the survey content. When a passenger was unable to read the survey and fill in the responses on their own due to reasons such as eyesight or lack of familiarity with an iPad, the survey questions were read to the passenger by a fellow passenger or a surveyor, with the responses entered on their behalf. Since online Kiosk Mode was used with SurveyGizmo and the iPads were equipped with cellular data, the responses from each partially or fully completed survey were automatically uploaded to the SurveyGizmo website. This kept the data secure, since it did not reside locally on the iPads. The survey incentive, a brightly colored metallic airplane baggage tag, was handed out to respondents who completed the full-scale survey in-person.

Post-flight survey. The intent of the post-flight survey was to ensure that passengers who had trans-Atlantic travel originating from the U.S. (LAX or SEA Airports), which primarily consisted of those who resided in North America, were also included in the sampling frame. Passengers who were willing to participate in the post-flight survey filled out a short form on the iPad prior to embarkation, which served the dual purposes of collecting demographic data for non-response bias testing and also obtaining contact information.

An email campaign was set up in SurveyGizmo to send an email to each passenger, personalized with their first name, which included a web link to the survey and other pertinent information, so they could complete it post-flight at their leisure. The email campaign provided the ability to track survey status by respondent (fully completed, partially completed, had not started, or disqualified), which was decoupled from individual survey responses. Many of the passengers noted that their access to email would either be limited or not available to them while traveling abroad, making them unable to immediately complete the survey. The researcher scheduled follow-up reminder emails, which was an effective strategy for boosting the response rate. Respondents who completed the post-flight survey were offered the incentive of an entry into an Amazon gift card drawing, with a 1/50 chance of winning a \$50 gift card.

Population/Sample

In 2017, the total number of passengers of all fare classes flying to/from the U.S. across the Atlantic (including to the Middle-East and Africa) was 77 million (Federal Aviation Administration, 2017). The population was comprised of trans-Atlantic economy and premium economy class travelers who had flown between the U.S./Canada and Europe in either direction. The sample was drawn from LAX departing passengers for LCLH carriers (Norwegian Air and WOW air) and FSCs (American Airlines and British Airways). SEA departing passengers consisted of LCLH (Norwegian Air) and FSCs (British Airways and Virgin Atlantic). The unit of analysis was the airline passenger.

Sampling method. Probability sampling is considered the *gold standard* of survey research, since statistical analysis was designed for such a sampling approach and intended to be representative of a given population (Vogt et al., 2012). While a more robust approach such as multi-stage cluster sampling could have been used to randomly select trans-Atlantic flights and then passengers from those flights, such an approach would have been too cost prohibitive and time intensive for an in-person survey. Convenience sampling was defined as:

A type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study. (Dörnyei, as cited in Etikan, Musa, & Alkassim, 2016, p. 2) While convenience sampling resulted in a lack of control over representativeness, and it was based upon passengers who were most available, rather than through the use of more robust statistical methods, the cost effectiveness and time efficiency of this sampling method made it the only realistic choice for the survey (Etikan et al., 2016). Firstly, the trans-Atlantic flights selected were scheduled at a variety of times and days of the week, while taking into account how the surveyors could effectively utilize their time to maximize the efficiency of data collection. Secondly, passengers from these flights were approached, with an equal chance of being included. The representativeness of the sample will be justified by comparing the demographics of this dissertation survey with that of a large-scale passenger survey. Biggs et al. (2009) noted the following limitations on conducting a passenger survey:

The respondents on any given flight will generally have a different distribution of characteristics from the target population as a result of the specific market served by the flight, the time at which the flight departs, and possibly other factors, such as the airline in question. Even if the flights to be surveyed have been randomly selected, it is unlikely that the selected flights will cover all possible combinations of market, airline, time of day, and day of week, because of budgetary limitations on the number of flights that can be included in the survey. The smaller the number of flights sampled, the less likely it is that the characteristics of the passengers on those flights will correspond exactly to those of the target population as a whole. (p. 9)

Sample size. The Raosoft (2004) calculator estimated a minimum sample size (n) of 380 with the following input parameters: margin of error E of 5%, confidence level x of 95%, estimated population size N of 30,000, and response distribution of 50%. The formula used for this calculation was:

$$n = N * x / ((N - 1)E^{2} + x).$$
(1)

G*Power (2014) calculator estimated a minimum sample size of 591 which was required to run the logistic regression with the model, which had the following input parameters: a priori, two-tailed, odds ratio of 1.3, pr (Y = 1 | X = 1) H₀ = .5, α of .05, Power of .80, R² other X of 0.2, Normal X distribution, X parm μ of 0, and X parm σ of 1. The setup is shown in Figure 12.

For logistic regression, Hair, Black, Babin, and Anderson (2010) recommended a minimum sample size of ten observations per estimated parameter per group. For the overall sample size for logistic regression per Hosmer and Lemeshow (as cited in Hair et al., 2010), the recommendation was greater than 400 observations. For exploratory factor analysis (EFA), Hair et al. (2010) recommended a sample size of ten observations per variable, and an overall sample size of at least 100 observations. Logistic regression was the statistical method being utilized with the most stringent sample size requirement. The minimum required sample size for this dissertation was 591 respondents from both airports and airline types, which was determined by selecting the most conservative sample size estimate for logistic regression, as determined by G*Power.



Figure 12. G*Power logistic regression sample size calculator output. G*Power (2014).

Data Collection Device

Full-scale survey. The full-scale online survey, which is described as follows, has been simplified into a paper format for inclusion in Appendix C. *Informed Consent Form:* detailed research topic, study leadership, purpose, eligibility, participation, risks of participation, benefits of participation, compensation, voluntary participation, respondent privacy, and contact information. By selecting yes, a passenger certified they had taken a trans-Atlantic flight, were 18 years of age or older, and willing to participate, therefore the survey content could then be viewed. *Part 1: Trip Characteristics* included the following questions: [1] trans-Atlantic airline flown, [2] U.S. or Canadian airport flown to/from, [3] European airport flown to/from, [4] aircraft type, [5] cabin class, and

[6] how long ago the trans-Atlantic flight was taken. *Part 2: Traveler Characteristics* consisted of the following questions: [7] trip purpose, [8] frequent flier program membership, and [9] number of round-trips by air within the past 12 months. *Part 3:*

Passenger Satisfaction with Airline consisted of Likert scale questions with the following scale: 1 = "Very Dissatisfied" to 5 = "Very Satisfied." The questions included [10] airfare paid, [11] flight frequencies, [12] departure and arrival times, [13] nonstop flights, [14] check-in, [15] checked and carry-on baggage policies and fees, [16] aircraft boarding, [17] baggage stowage space, [18] seat assignment policies and fees, [19] design and layout of aircraft cabin and layatories, [20] cleanliness of aircraft cabin and lavatories, [21] legroom, [22] seat width, [23] seat comfort, [24] personal space, [25] pilot announcements and interactions, [26] cabin crew service, [27] courtesy and responsiveness of staff, [28] customer service, [29] reliability, [30] punctuality, [31] safety, [32] image, and [33] reputation. The following Likert scale questions included an N/A option, since they were not relevant to all passengers: [34] problem solving ability of staff, [35] ease of flight booking, [36] in-flight entertainment, [37] food and beverage, and [38] baggage handling. *Part 4: Willingness to Switch* for LCLH passengers [39a] provided a description of an all-inclusive FSC offering, and asked passengers if they'd be willing to switch from an LCLH to an FSC. Passengers responding "yes" were directed to [40a], which asked how much more money they'd be willing to pay to switch. For an FSC, passengers [39b] were provided a description of an unbundled LCLH offering and asked if they'd be willing to switch from an FSC to an LCLH carrier. Passengers responding "yes" were directed to [40b], which asked how much less money they'd be willing to pay to switch. Both [41a/41b] were open-ended

questions which asked passengers the reason(s) why or why not they'd be willing to
switch carrier type. *Part 5: Demographics* consisted of the following questions:
[42] gender, [43] geographic region of residence, [44] nationality, [45] education level,
[46] age, and [47] household income level. The willingness to pay and household income
questions were asked in U.S. dollars, with a web link to a currency converter provided.

Passenger data form. For the full-scale survey, a Passenger Data Form as shown in Appendix C, was created in SurveyGizmo and administered via the iPad, asking passengers who were willing to take the survey post-flight the following questions: [1] trans-Atlantic airline flown, [2] first name and email address, [3] number of roundtrips by air within the past 12 months, [4] education level, and [5] age.

Instrument reliability. Reliability is "that quality of measurement method that suggests that the same data would have been collected each time in repeated observations of the same phenomenon" (Babbie, 2013, p. 148). Construct reliability is a "measure of reliability and internal consistency of the measured variables representing a latent construct" (Hair et al., 2010, p. 669). Construct reliability was evaluated, with a target value of .7 or higher (Hair et al., 2010). Cronbach's alpha was utilized to measure internal consistency or reliability of the constructs with a target value of .7 or higher (Hair et al., 2010). Survey research conducted with a standardized, self-administrated questionnaire enhanced reliability. Existing passenger survey research served as a basis for the development of the survey, which led to stronger reliability. The pre-testing and pilot testing were deemed acceptable for survey instrument reliability.

Instrument validity. Validity is "the extent that a measure adequately reflects the real meaning of a concept under consideration" (Babbie, 2013, p. 151). Survey research tends to be weak on validity, since it is artificial. Face validity is a "quality of an indicator that makes it seem a reasonable measure of some variable" (Babbie, 2013, p. 151). Content validity is "the degree to which a measure covers the range of meanings included within a concept" (Babbie, 2013, p. 152). "Construct validity is demonstrated when the instrument is truly measuring the construct it was designed to measure, and not some other construct" (Ruel et al., 2016, p. 93). Instrument validity was ensured by the following measures: existing literature and validated survey instruments consulted to aid in questionnaire development; and subject matter experts were sought to provide feedback during the pre-testing phase regarding face, content, and construct validity.

Treatment of the Data

The initial data preparation and data cleaning was done in SurveyGizmo, followed by Excel. Then EFA, reliability testing, confirmatory factor analysis (CFA), binomial logistic regression, and decision tree analysis were performed using Statistical Package for the Social Sciences (SPSS) and the AMOS plug-in. The data preparation and statistical analysis will be further described below.

Data preparation and cleaning. The data from surveys was exported from SurveyGizmo into XLS format, in order to review and format the data in Excel. The first step of the data cleaning process was to use listwise deletion to omit surveys that were partially completed. The Likert scale questions were checked for evidence of *straightlining*, which is where the same response was repeatedly selected, often for entire matrices. Listwise deletion was utilized when warranted to omit surveys that had questionable data quality. The final step was uploading the file to SPSS to perform the analysis.

Demographics. Demographic data that was categorical, such as gender or nationality; and ordinal data, such as education or income level, were displayed in charts and graphs comparing the results by airport and airline type. The demographic data also helped to characterize the sample and was compared with Airs@t Survey data to determine to what extent the results were generalizable.

Descriptive statistics. Descriptive statistics were performed in order to get a first look at the data. For each of the Likert scale questions the mean, mode, standard deviation, skewness, and kurtosis were calculated for LCLH and FSC data sets.

Non-response bias test. Ruel et al. (2016) defined non-response bias as "the difference that results when participants are significantly and qualitatively distinct from nonparticipants" (p. 163). Ruel et al. (2016) stated that "if non-response occurs randomly, meaning there is no pattern to the level of non-response and the response rate is greater than 70%, then the dataset is of good quality" (p. 162). The chi-square (X^2) test of homogeneity was utilized to test for statistically significant differences between respondents and non-respondents on traveler and demographic characteristics, since it was suited for categorical data that was represented in counts (De Veaux, Velleman, &

Bock, 2012). The null hypothesis was that the respondents and non-respondents did not differ in the distributions of demographic characteristics, and the chi-square test determined whether differences that existed were due to random variation (De Veaux et al., 2012).

Outliers. Multivariate outliers were detected by evaluating Mahalanobis distance (D^2) with Byrne (2010) noting that observations with a " D^2 value that stands distinctly apart from all the other D^2 values" could require deletion (p. 106).

Exploratory factor analysis. EFA R-type was used to identify highly correlated survey variables that formed latent dimensions. The purpose of EFA was to "define the underlying structure among the variables in the analysis" (Hair et al., 2010, p. 94). Benefits of factor analysis included the fact that multiple survey questions could be asked on related variables, thus implications of confounding variables were reduced, and data reduction was performed prior to further statistical analysis (Hair et al., 2010). Correlations amongst variables, and multicollinearity, which was the "extent to which a variable can be explained by other variables in the analysis" (Hair et al., 2010, p. 93), were necessary. "A basic assumption of factor analysis is that some underlying structure does exist in the set of selected variables" (Hair et al., 2010, p. 103).

In order to determine that the assumptions were met, the correlations were evaluated for practical and statistical significance (> .7 for partial correlations). Next, the Bartlett test of sphericity which was utilized for the overall significance of the correlation matrix (p < .05), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) (> .50 for each variable and overall test) were analyzed to determine the factorability (Hair et al., 2010). Component analysis was used to extract the factors, and the number of factors to be extracted was determined by evaluating the results of the scree test, percentage of variance criterion, and latent root criterion with eigenvalues greater than one. Rotation of the factor matrix was performed as required in order to redistribute variance and eliminate cross-loading issues. Deleting variables, changing the rotational method, changing the extraction method, or changing the number of factors were methods that were utilized to respecify and explore various models (Hair et al., 2010). A viable factor structure required loadings that were statistically significant, with a target of at least .50 (although .30–.40 is minimally acceptable), and sufficient communality (variance of a variable which is attributed to factors) with at least .50 (Hair et al., 2010). Multiple factor structures were examined before selecting the optimal factor structure for each data set: LCLH, FSC, and Both (LCLH + FSC); that fulfilled the intended purpose of reducing the large number of Likert scale variables down to a small set of latent constructs. These factors were then named to best describe the group of variables of which they were comprised.

Confirmatory factor analysis. After the preliminary factor structure was identified via EFA, CFA was performed to test the measurement model. The AMOS plug-in for SPSS was used to perform CFA. First, the input path diagram was drawn, which depicted the impact variables and the single factor that each loaded onto, along with the error terms. Normality was evaluated based upon kurtosis, with values of < 3 being preferable, and with values as high as 5 deemed acceptable. Multiple criteria were

utilized to examine model fit along with reliability and validity per Table 2, including goodness of fit (GFI), adjusted goodness of fit (AGFI), normed fit index (NFI), comparative fit index (CFI), CMIN/df, and root mean square error of approximation (RMSEA). Modification indices (MIs) were evaluated for covariances of error terms and cross-loading of impact variables onto constructs. Reliability and validity testing was performed in Excel, utilizing the CFA output from AMOS. If the model fit, reliability, and validity testing identified deficiencies in the measurement model, then impact variables required deletion, or error term correlations required specification. Adjustments were then made to the measurement model, which was retested in an iterative process until the final measurement model was determined. AMOS was then used to calculate the factor scores using regression imputation, which were then imported into SPSS for further statistical analysis.

Table 2

Target Values for Measurement Model

Parameter	Target Value	Source
Goodness of Fit (GFI)	> .90 to .95	Hair et al. (2010)
Adjusted Goodness of Fit (AGFI)	> .90 to .95	Hair et al. (2010)
Normed Fit Index (NFI)	> .90 to .95	Byrne (2010)
Comparative Fit Index (CFI)	> .90 to .95	Byrne (2010)
CMIN/df	\leq 3	Hair et al. (2010)
Root Mean Square Error Approx. (RMSEA)	< .05 to .08	Hair et al. (2010)
Factor Loadings	$\geq .5$ to .7	Hair et al. (2010)
Average Variance Extracted (AVE)	≥.5	Hair et al. (2010)
Discriminant Validity	$AVE > correlation^2$	Hair et al. (2010)
Construct Reliability	> .7	Hair et al. (2010)
Cronbach's alpha	\geq .6 to .7	Hair et al. (2010)

Logistic regression. The next phase required using the impact variables to perform logistic regression, which was a "specialized form of regression that is formulated to predict and explain a binary (two-group) categorical variable" (Hair et al., 2010, p. 317). The logistic regression equation has the following format:

$$Y_1 = X_1 + X_2 + X_3 + \ldots + X_n.$$
 (2)
(binary nonmetric) (nonmetric and metric)

Logistic regression is a versatile statistical method, as linear relationships were not required between the independent and dependent variables, the independent variables were not required to have a normal distribution, and heteroscedasticity was not a concern (Hair et al., 2010). Multicollinearity was checked to ensure that none of the independent variables exhibited high correlations with the other independent variables (Hair et al., 2010). If the extent of multicollinearity was unacceptable, then the impact variables could be replaced with factors derived from CFA. The impact variables or factors were used as predictors. The dependent dichotomous variable was either passenger choice of an FSC (value of 0) or LCLH (value of 1); or amount willing to pay to switch with a lower U.S. dollar range (value of 0) or a higher U.S. dollar range (value of 1). The probability for every observation was determined to be a value between 0 and 1, thus the plot for the logistic curve took on an S-shape (Hair et al., 2010). "This predicted probability is based on the values of the independent variables and the estimated coefficients" (Hair et al., 2010, p. 324). If the probability was \leq .5, it was assumed that a
passenger chose the dichotomous variable represented by 0. If the probability was > .5, then it was assumed that the passenger chose the variable represented by a 1.

Each impact variable or factor was evaluated to determine if the difference between passenger responses for the dependent variable were statistically significant. Impact variables or factors which were statistically significant could have predictive capability, and were most likely to be chosen for the logistic regression variate. To estimate the base model, the log likelihood value (-2LL) was utilized. Forward stepwise estimation was then performed, with impact variables or factors being added one by one, starting with the statistically significant impact variable or factor that had the highest score statistic (reduction in -2LL value). With each impact variable or factor added, the hit ratio and pseudo R^2 values were evaluated. The hit ratio was the correct classification of passengers (either by carrier type or willingness to pay), with a high value being desirable. Next, overall fit of the models generated was compared, in order to select the best model. The chi-square test evaluated change in the -2LL value from the base to subsequent models, with the objective being the lowest -2LL value, which was statistically significant. The Hosmer and Lemeshow measure was utilized to test for differences between the actual and predicted values, with the objective being a low value that was not statistically significant. For pseudo R^2 values, the objective was a high value. Then the Wald statistics for the estimated coefficients utilized in the selected model were checked for statistical significance.

The coefficients represented the impact of the independent variables or factors on the likelihood of a passenger choosing a respective carrier type or for willingness to pay. Original coefficients with a positive sign increased and a negative sign decreased the probability of LCLH carrier choice or amount willing to pay. Exponentiated coefficients with values > 1 increased and values < 1 decreased the probability of LCLH carrier choice or amount willing to pay. As a result, the impact variables or factors and their relative importance, which affected customer choice of an FSC or LCLH carrier, or amount willing to pay, could be identified.

Decision tree. "The Decision Tree procedure creates a tree-based classification model. It classifies cases into groups or predicts values of a dependent (target) variable based on values of independent (predictor) variables" (IBM, 2012, p. 1). Decision tree analysis was selected to further understanding of relationships of variables that affected the willingness to switch carrier type (LCLH $\leftarrow \rightarrow$ FSC). Multiple growing methods and combinations of impact variables and factors were then used to explore the data, with the most insightful decision trees contained in Chapter IV.

Qualitative data. Open-ended question responses offered "more nuance, depth, and substance than closed-ended responses" and, as such, could lead to deeper insights when interpreting the survey data (Ruel et al., 2016, p. 68). Each survey contained one open-ended question to further the understanding of quantitative results regarding whether a passenger would remain loyal to a carrier type (LCLH or FSC) or if there would be a willingness to switch, rather than to address specific research questions. The qualitative data for each question was exported into an Excel spreadsheet. The data was then manually coded, which was "a means of sorting or grouping the responses so that the material bearing on a given topic can be physically separated from other data" (Ruel

et al., 2016, p. 203). After reading through the responses for open-ended questions, coding categories were developed which were then used to classify the responses into common themes, after which each of the responses had the applicable code(s) applied (Ruel et al., 2016). Frequency counts were shown in pie charts and graphs, word clouds were created, and pertinent passenger comments were quoted within the dissertation.

Ethical Considerations

Survey research, particularly in the context of an airline passenger survey, is considered among the least intrusive, so it was unlikely to cause any harm to the participants. Informed consent was obtained by providing an electronic letter to prospective participants informing them of the purpose of the research, and noting that participation was voluntary and they could discontinue the survey at any time and were not obligated to fully complete it.

Institutional Review Board

The IRB approval process was completed so that research with passengers could be carried out for the ERAU dissertation. The IRB application, including the informed consent document and the survey instrument, was submitted to ERAU. Since passenger survey research was conducted at airports, the IRB required approval letters from the airport authorities (LAWA and the Port of Seattle). While airline approval was not required by the IRB, LAWA took the extra step of informing the trans-Atlantic airlines about the planned surveying activity at LAX, and the Port of Seattle obtained approval from the airline station managers at SEA. Since this survey research was considered low risk, it was classified as exempt, and IRB approval was granted prior to the pilot study being performed. IRB and airport approval letters are contained in Appendix B.

CHAPTER IV

RESULTS

This chapter detailed the results of the passenger survey research. The initial section was focused on the pilot study. Subsequently, the results of the full-scale study were presented, which included an overview, response rates, non-response bias testing, data organization and screening, and demographics. Then the results of EFA and CFA, which established a factor structure for passenger choice were shown, followed by binary logistic regression, which determined what variables/factors affected a passenger's choice of LCLH or FSC. In order to evaluate willingness to switch airline type (LCLH $\leftarrow \rightarrow$ FSC), decision tree analysis was performed. Binomial logistic regression was then utilized to evaluate willingness to pay more to switch to an FSC or willingness to pay less to switch to an LCLH carrier. Finally, the results of the qualitative open-ended questions that asked passengers the reasons for their decision of willingess to switch were presented, offering greater insights into passengers' decision-making process.

Pilot Study

Overview. The pilot test for the trans-Atlantic survey was conducted at LAX Airport from July 27–30, 2017. Passengers in the Tom Bradley International Terminal who were present in the airside departure lounge area for LCLH Norwegian Air London– Gatwick or FSC British Airways London–Heathrow flights were approached. Departing passengers were selected from only these two airlines to reduce variability of responses due to the small sample size of the pilot study, although some passengers had completed the survey on the basis of having flown a different airline from Europe to North America. A total of 122 responses were received, including 105 in-person surveys and 17 postflight surveys, with N = 118, since four cases had to be deleted, as their chosen airline was not known or it did not fit the LCLH or FSC classification. There were 34 in-person refusals (11 would have said yes had they been eligible to complete the survey inperson), 10 partially completed surveys, 38 non-respondents from the post-flight survey, and 16 passengers who were identified as not understanding English. The overall response rate was calculated as 58.4%. Follow-through for the post-flight surveys was low, as only 30.9% of passengers who said they would take the post-flight survey actually did. Passengers were only given 2.5 weeks to respond, and no follow-up emails were sent.

Demographics. The demographics shown in Figure 13 are presented for the full pilot study sample (N = 118). Regarding choice of airline, 47% had flown British Airways, 41% Norwegian Air, and 12% Other. As far as gender, the sample consisted of 47% males and 53% females. In the age category, 46% were 18 to 34, 45% were 35 to 54, and 9% were 55 and above. Considering household income, 44% had earnings of less than \$50,000 and 30% an income of six figures and above. For education level, 44% held a bachelor's degree and 35% an advanced degree. With regard to trip purpose, vacation (74%) and family (14%) were the most common reasons. This sample was representative enough for the purpose of this pilot study.



Figure 13. Pilot study demographics.

Instrument reliability and validity. The pilot study statistical analysis was performed on the basis of n = 94, which included passengers who had flown American, British Airways, or Norwegian Air. There were 24 surveys that were deleted for the following reasons: late response (n = 4), straightlining (n = 3), outliers (n = 3), N/A responses (n = 6), speeding (n = 1), or other LCLH/FSC airline (n = 7). Due to the small sample size, only the statistical results from EFA were presented, as shown in Table 3. Principal Component Analysis was the method chosen for EFA, and the Varimax (orthogonal) rotation method was selected. Six factors were extracted based upon having an eigenvalue of greater than 1, with the percentage of variance explained being 59.8%. The factor names were tentatively determined based on the findings of this pilot study and what best described the variables that comprised the constructs. Construct reliability was evaluated on the basis of the Cronbach's alpha target of > .7. The construct reliability target was achieved for F1 Operations (.844), F2 Service (.859), and F3 Comfort (.825). The target was not achieved for F5 Baggage (.601) or F6 1st Impression (.612).

Table 3

<i>,</i>	1	2	3	4	5	6
	Operations	Service	Comfort	Price	Baggage	1 st Impression
X8 AIRFARE				.759		
X9 FREQUENCY	.541					
X10 DEP & ARR TIMES	.604					
X11 NONSTOP FLTS	.509					
X13 BAG POLICY					.565	
X14 BOARDING					.761	
X15 BAG STOWAGE						.721
X16 SEAT ASSIGN						.563
X18 CLEANLINESS						.548
X19 LEGROOM			.795			
X20 SEAT WIDTH			.638			
X21 SEAT COMFORT			.749			
X22 PERSONAL SPACE			.824			
X23 PILOT		.482				
X24 CABIN CREW		.744				
X25 COURTESY & RESP		.826				
X26 CARING & FRIENDLY		.782				
X27 SERVICE		.757				
X28 PROBLEM SOLV		.636				
X29 RELIABILITY	.627					
X30 PUNCTUALITY	.702					
X31 SAFETY	.680					
X32 IMAGE	.683					
X33 REPUTATION	.647					
X34 FLT BOOKING	.613					
X36 IFE				.492		
X37 FOOD & BEVERAGE			.499			
X39 BAG HANDLING					.552	

Pilot Study Varimax Rotated Component Matrix

Survey instrument and procedures. The following are lessons learned from the pilot study, which resulted in adjustments being made to the full-scale survey. [1] Deletion of Questions: In the full-scale study, X26 Caring and Friendly was omitted since it was a double-barreled question; X35 In-Flight Wi-Fi was deleted due to many passengers not utilizing this service and since LCLH carriers Norwegian and WOW air did not offer this service on trans-Atlantic flights; and X38 Frequent Flier Program was deleted due to redundancy with another question. [2] Non-Response Bias Testing: During the pilot test, it was not feasible to obtain demographic data from passengers who did not want to participate, as they were unapproachable and it would have been too intrusive. A solution for the full-scale survey was to create a data collection form on the iPad to discretely ask passengers three questions—travel frequency, education level, and age range, such that non-response bias testing could be performed on the post-flight respondents vs. non-respondents. [3] Post-Flight Response Rate Low: For the full-scale survey, follow-up email reminders were utilized, plus the surveys were kept open longer, giving passengers more time to respond. [4] Survey Incentives: The Amazon gift card prize drawing (1/50 chance of \$50 gift card) used for the pilot test was a hindrance, since passengers who opted not to provide their contact information in order to participate prevented the survey from reloading on the iPad, forcing a manual logout and relog into the survey software to occur. Passengers taking the full-scale survey received a brightly colored metallic airplane baggage tag in-person, but passengers who took the survey after their flight were offered the opportunity to participate in the Amazon gift card drawing. [5] Surveyor Assistance: It was determined that for the full-scale survey, which would be more time-intensive due to the data collection form plus the distribution of baggage tags, a second surveyor would be utilized when possible, with the training for this person detailed in Chapter III. [6] iPADs: Although unlimited Wi-Fi plans were purchased for the iPads, connectivity issues impacted data collection. Thus for the full-scale test, cellular data plans were purchased for the iPads. Additionally, it was determined that five additional iPads were necessary, so a total of 10 iPads were made available for the full-scale contact form and in-person surveys. [7] Currency Conversion: This was

determined to be time intensive, therefore for the full-scale survey, the questions were revised to yield responses in U.S. dollars, and a link to a currency converter (XE, 2017) was inserted into the survey. [8] Separate Surveys: For clarity of question wording, two separate instruments for the full-scale survey were created for each airport: one for inperson passengers (Europe to U.S./Canada) and the other for post-flight (LAX/SEA to Europe) passengers. [9] Survey Completion Time: Based upon pre-testing, the expected survey completion time was 8–10 minutes. However, for the pilot test, the minimum completion time was 2 minutes, maximum completion time was 42 minutes, and the average was 14 minutes. [10] Straightlining: A systemic issue that was found with many of the surveys for the Likert scale questions was straightlining, where a particular response was repeatedly selected, sometimes all of the way down the matrices. While SurveyGizmo had an option of randomization for the Likert scale questions to address order bias and the tendency for straightlining, feedback determined that it was best to keep the question order as is, since the questions were presented in a logical order and were already grouped into multiple matrices. It was difficult to determine if responses reflected a passenger's experiences, or if they were due to satisficing and answering without thought (i.e. just clicking through the survey). Thus only surveys with pure straightlining were deleted.

Full-Scale Survey

Overview. Passenger survey research was performed at LAX and SEA Airports, which involved the researcher personally approaching 2,495 LCLH and FSC passengers for the full-scale survey over the course of 81 flights and 29 days from August to October

of 2017, as shown in Table 4. The total sample size of fully completed surveys, after initial data screening, was N = 1,412. Table 5 shows the total number of LCLH and FSC surveys completed by airport, and in-person versus post-flight.

Table 4

Airlines and Flights Surveyed

Airline	Туре	U.S. Airport	European Airport	Aircraft Type	Flights
American	FSC	LAX	London-Heathrow	B777	12
British Airways	FSC	LAX	London-Heathrow	A380	11
British Airways	FSC	SEA	London-Heathrow	B747/B777	8
Virgin Atlantic	FSC	SEA	London-Heathrow	B787	8
Norwegian Air	LCLH	LAX	London-Gatwick	B787	17
Norwegian Air	LCLH	SEA	London-Gatwick	B787	8
WOW air	LCLH	LAX	Keflavík	A330	17

Table 5

	In-Person	Post-Flight	Total
LAX	752	360	1,112
LCLH	420	260	680
FSC	332	100	432
SEA	175	125	300
LCLH	50	57	107
FSC	125	68	193
Total	927	485	1,412

lated I CI H and ESC S.

The unbalanced sample size between LAX and SEA surveys was due to several reasons. [1] At LAX, daily LCLH flights offered by both Norwegian Air and WOW air were included in the sampling frame. Whereas at SEA, Norwegian Air was the sole LCLH carrier, with only four flights per week, and since service just commenced, its

passengers were predominately North Americans who were not eligible to take the survey in-person. [2] The FSCs operated larger wide-body jets from LAX, which resulted in more passengers available to survey from a given flight. [3] The surveys were conducted at LAX toward the end of the summer season (August/September), whereas surveys were conducted at SEA during the off-peak season (September/October) when load factor typically declines. [4] LAX passengers had more time to respond to the post-flight survey since it was kept open longer than the post-flight SEA survey, which was toward the end of the data collection phase. Thus the response rate was understandably lower for the SEA passengers.

Post-flight survey follow-up. For the LAX post-flight surveys, passengers who said they would participate were sent an initial plus two follow-up emails. While SEA passengers in the first round of surveying received two follow-up emails, those in the second round received only one follow-up, since the window of time for responses before the survey closed was shorter. The follow-up emails were scheduled with a combination of relative dates (i.e. follow-up 10 days later) and also fixed dates. Figures 14 and 15 for LAX and SEA respectively show post-flight survey respondents. Post-flight follow-up was a highly effective strategy—considering both airports 216 surveys on initial contact, 218 surveys on first follow-up, and 62 surveys on second follow-up were completed.



Figure 14. LAX post-flight completed surveys.



Figure 15. SEA post-flight completed surveys.

Non-respondents. Table 6 shows data on the non-respondents. Passengers who could not take the survey due to limited English were not counted in the non-response rate. The in-person refusals included passengers who said no to either the in-person or

the post-flight survey, depending upon which they were eligible to take. The partial surveys were those that were started but not fully completed.

Table 6

	Limited English	In-Person Refusal	In-Person Partial	Post-Flight Partial	Post-Flight Non-Respondents
LAX	106	326	11	23	348
LCLH	47	158	2	17	234
FSC	59	168	9	6	114
SEA	8	123		4	133
LCLH	4	30	0	1	66
FSC	4	93	1	3	67
Total	114	449	12	27	481

Response rates. The overall response rate for LCLH and FSC passengers was 61.1% for LAX and 53.5% for SEA. The following equation was utilized to calculate the survey response rates:

Response Rate = [Completed Surveys]
$$\div$$
 (3)

[Completed Surveys + Refusals + Partials + Non-Respondents].

These response rates were considerably higher than the rates in other survey studies. Simpson (1995) surveyed trans-Atlantic passengers in 1994, comparing service quality of U.S. and European airlines by having cabin crew distribute surveys to passengers while in-flight. Simpson (1995) had a 26% response rate, which was impacted by cabin crew not distributing surveys on pre-specified flights, the packets of surveys being lost or never mailed back, and incomplete surveys—since the surveyor was not able to review them prior to submittal. For airline satisfaction, in benchmark surveys conducted by professional interviewers at U.S. airports, an 8–10% response rate is typically achieved, which is the lowest of any other geographic region (V. Lima, personal communication, June 2, 2017). The Airs@t trans-Atlantic survey, which is conducted at U.S. and European airports, has an approximate 15% response rate (V. Lima, personal communication, March 8, 2018). This illustrates the difficulty of airline passenger survey research, particularly in the U.S. and the trans-Atlantic market.

Approaching the trans-Atlantic passengers as a Ph.D. student, rather than as a seasoned professional interviewer, turned a perceived disadvantage into a strength. Passengers tended to be very sympathetic to the plight of a graduate student and wanted to help by participating. Since the LAX surveys were done first and the post-flight survey was kept open longer, the response rate was higher for LAX. The response rate was adversely impacted by passengers who were willing to complete the survey in person; however, they were ineligible since they had not yet taken their trans-Atlantic flight and did not want to disclose their email address or take the survey post-flight.

Non-response bias test. The purpose of the non-response bias test was to determine if statistically significant demographic differences existed between the respondents and non-respondents, which could indicate a biased sample. The surveyors had to be particularly careful of remaining respectful of a passenger's wishes to decline to participate in the survey, since being granted access to the airside departure lounge areas of airports was an uncommon privilege. Therefore, demographic questions were not

asked of passengers who did not want to participate in the survey. Instead, passengers who were willing to take the survey post-flight about their flight to Europe were asked to fill out a contact information form which asked three optional demographic questions: travel frequency, education level, and age range. N = 939 consisted of passengers that met three criteria: they expressed willingness to complete the survey post-flight, they fully completed the contact information form including the demographic questions, and their status for the post-flight survey email notification indicated that it was received. As a result, the data set that was utilized for non-response bias testing was distinct and was only used for this particular purpose. Passengers who fully completed the survey either initially or after being sent a first or second follow-up email were counted as respondents: LCLH (n = 321) and FSC (n = 163). Passengers who did not start the survey or partially completed it were counted as non-respondents: LCLH (n = 285) and FSC (n = 170).

Chi-square (X^2) tests of homogeneity were performed for LCLH and FSC passengers separately on the basis of travel frequency, education, and age to determine if there were statistically significant differences between respondents and non-respondents, with results shown in Table 7. Subsequently, the crosstabs and standardized residuals were examined. Non-response bias was not found for LCLH passengers on the basis of travel frequency or education level. Non-response bias was not noted for FSC passengers on the basis of travel frequency or age.

However, non-response bias was found for LCLH passengers on the basis of age (p < .01). The 18 to 34 year old passengers completed the survey in fewer numbers than expected, and the 55+ passengers completed the survey in greater numbers. Additionally, non-response bias was found for FSC passengers on the basis of education (p < .01).

Fewer passengers with a high school education completed the survey than expected, and more passengers with a MS/Ph.D. completed the survey than expected. Numerous passengers shared their past and present experiences performing survey research or pursuing an advanced degree, and noted they empathized and wanted to help, thus it was not surprising they responded in greater numbers. The representativeness of the sample will be further evaluated as follows, by comparing the dissertation demographics with those from the Airs@t trans-Atlantic survey conducted on behalf of IATA.

Table 7

Demographic	Carrier Type	Airport	n	X^2	Asymptotic <i>p</i>
Travel Frequency	LCLH	SEA + LAX	606	9.7	.021
Education	LCLH	SEA + LAX	606	6.6	.038
Age	LCLH	SEA + LAX	606	10.0	.007**
Travel Frequency	FSC	SEA + LAX	333	2.2	.539
Education	FSC	SEA + LAX	333	22.2	.000**
Age	FSC	SEA + LAX	333	6.1	.048

Chi-Square Test Results for Non-Response Bias

***p* < .01.

Data organization and screening. The data organization and screening process consisted of reviewing surveys for missing data, organizing the data, checking for non-differentiated responses, missing values, and outliers.

Missing data. A total of 39 surveys were partially completed, where either the

respondent quit the survey or skipped over one or more survey questions without

responding. The partially completed surveys were omitted via listwise deletion, since a sufficient sample size of fully completed surveys was achieved.

Data organization. The column headers, categorical responses, and Likert scale responses were set up in SurveyGizmo to facilitate exporting the data from the 1,566 completed full-scale surveys into XLS format. The first step of the data cleaning process was to prepare the raw data within Excel. Text shown in the Other column for airline flown, U.S. airport, European airport, trip purpose, geographic region, and nationality was reviewed. It was necessary to determine if a category already existed for a response, a new category needed to be added, or if the response was erroneous. Once this process was completed, the Other columns were deleted. A new column was added to classify passengers as having flown an LCLH or an FSC. The aircraft type variable was deleted, since in many cases the respondents provided inconsistent responses (i.e. they thought they had flown on a B797, which is a future middle-of-the-market aircraft type Boeing is considering, or they selected an aircraft type that their chosen airline did not fly), calling into question the reliability of the data. Cases were deleted for respondents who had flown an airline that did not meet the LCLH or FSC classification (charter carriers n = 12, hybrid carriers n = 120), or that did not operate in the trans-Atlantic market (Asian airline n = 1), since they were outside of the sampling frame. Surveys with unusable data—with examples being inconsistent responses, unintelligible responses, or Other responses left blank (n = 21)—were also removed, resulting in a sample size of N = 1,412.

Non-differentiated Likert responses. Due to the high number of Likert scale questions in the survey, they were organized into four matrices, since respondents could more expeditiously answer the questions in this format. However, online surveys in matrix format tend to promote straightlining or non-differentiated responses (Lavrakas, 2008), which was exacerbated by having questions that seemed closely related or redundant to respondents for the purpose of establishing a factor structure. Responses had a 5-point scale: 1= "Very Dissatisfied" to 5 = "Very Satisfied" for the first 24 Likert scale questions. To evaluate the prevalence of non-differentiated responses, they were examined to determine how many times a respondent had selected the same response for the set of 24 Likert scale questions. Those who had selected the same response 24 times had straightlined the entire set of Likert questions. Therefore, their data was deemed invalid, and the 67 cases where this occurred were deleted, leaving a remaining sample size of n = 1,345.

Missing values. Five Likert scale variables shown in Table 8 had an N/A option since, based upon pre-testing and the pilot study, it was deemed that those were amenities or services that either a passenger may not have used, or the airline may not have provided. The intent was to have a full data set for statistical analysis. X34 Flight Booking was retained, due to the small number of cases having an N/A response (n = 21) which were deleted, leaving a sample size of n = 1,324. Since a common factor structure needed to be achieved for both LCLH and FSC, the following variables with a large amount of N/A responses, particularly for LCLH, were deleted: X36 In-Flight Entertainment, X37 Food and Beverage, and X39 Baggage Handling.

Table 8

Variable	N/A	Deleted	Rationale
X28 Problem Solving	274	Variable	Too many N/A responses.
X34 Flight Booking	21	Cases	Few N/A responses.
X36 In-Flight Entertainment	91	Variable	WOW air does not offer IFE.
X37 Food & Beverage	112	Variable	Too much LCLH data loss (106 cases).
X39 Baggage Handling	87	Variable	Too much LCLH data loss (76 cases).

N/A Responses for Likert Scale Questions

Outliers. Outliers were examined for the set of 25 Likert scale variables utilizing the combined set of LCLH and FSC cases. The presence of univariate outliers, noted via boxplots, were not used as criteria for deleting any cases given the fixed 1–5 Likert rating scale. Instead, the presence of multivariate outliers was analyzed by Mahalanobis D^2 values. There were 79 cases with $D^2 < .001$, 68 cases with $D^2 < .0005$, and 45 cases with $D^2 < .0001$. The impact of the multivariate outliers was explored by evaluating EFA results with and without the outliers, and notable differences were not observed. Since the sample size achieved was more than sufficient, the threshold set for multivariable outliers was $D^2 < .001$; thus 79 cases were deleted, including 27 FSC cases (20 LAX & 7 SEA) and 52 LCLH cases (48 LAX & 4 SEA). Therefore, the remaining sample size was n = 1,245.

Demographics of Respondents

The demographics of respondents are presented first by airport and next by airline type, with a usable sample size of n = 1,345. Then the representativeness of the sample will be considered, by comparing dissertation survey data with Airs@t survey data.

Comparing airports (SEA vs. LAX). This initial set of demographic data compares respondents who were surveyed at SEA (n = 286) with those who were surveyed at LAX (n = 1,059), with pie charts shown in Figure 16. The demographic profiles were consistent for SEA and LAX on the basis of gender, education level, and 12 month round-trip travel frequency. Differences were seen between SEA and LAX on the basis of age, 2016 household income, and trip purpose. The SEA respondents tended to be older and LAX respondents younger. Regarding the 2016 household income of respondents, the distribution of income was higher in SEA and lower in LAX. A greater proportion of respondents at LAX were in the 18 to 24 age range, thus more could still be in school or not yet working and established in their careers—which could account to some extent for the lower household income reported. Regarding trip purpose, nearly half of SEA respondents were traveling for vacation, with the second most common reason being visiting friends and relatives; whereas the majority of respondents at LAX were traveling for vacation. To some extent, differences in demographics could be attributed to seasonal variation, since the LAX in-person surveys were done in the August/September timeframe, which is a popular time of year for vacations, plus many younger passengers could have been on break from school; whereas the in-person surveys at SEA were done in September/October.



Figure 16. Full-scale survey demographics by airport.



Figure 16. Full-scale survey demographics by airport (continued).



Figure 16. Full-scale survey demographics by airport (continued).

Comparing airline types (LCLH vs. FSC). Next, the demographics will be presented on the basis of comparing respondents who had flown an LCLH (n = 753) with those who had flown an FSC (n = 592), which are presented in the subsequent plots as shown in Figure 17. LCLH passengers were surveyed in greater numbers from Norwegian Air (61%) in comparison to WOW air (36%). A token number (n = 20) of passengers had flown other LCLH carriers: Eurowings, LEVEL, or WestJet. While trans-Atlantic respondents had primarily selected SEA or LAX as their North American arrival or departure airport, data was collected from passengers who had flown to or from 22 other U.S. airports, Canada (n = 24), or Mexico (n = 1). What this indicates is that passengers who completed the survey on the basis of their Europe to North America flight did not necessarily fly into SEA or LAX, although they utilized those airports for return flights. The two passengers who had flown to T.F. Green Airport nearby Providence, Rhode Island, are notable, since they represent the only LCLH passengers surveyed who had flown trans-Atlantic in this secondary market. Having surveyed

passengers who had flown into other North American airports has improved the generalizability of this study.

The demographic profiles were fairly consistent for LCLH and FSC respondents on the basis of cabin class, gender, trip purpose, and travel frequency. Differences were seen between LCLH and FSC on the basis of age, household income, and education level. LCLH passengers tended to be younger than the FSC passengers. The distribution of income was slightly lower for LCLH than FSC respondents. While 75% of both LCLH and FSC passengers were college educated, fewer LCLH than FSC respondents held advanced degrees. The majority of respondents lived in Europe (n = 844) followed by North America (n = 457). While British (n = 503) and American (n = 445) were the primary nationalities of passengers surveyed, the sample was very diverse, as LCLH and FSC passengers of 45 nationalities were represented.

The majority of respondents were not frequent flier program members of their chosen airlines or alliance partners, with only 15% of LCLH and 35% of FSC passengers noting their membership. LCLH carrier WOW air does not offer a frequent flier program, thus it was not shown in the data. Only 45% of respondents were willing to switch from LCLH to FSC, with Norwegian Air and WOW air respondents being likely to switch in near equal numbers. FSC respondents were less inclined to switch to an LCLH carrier, with only 24% being willing.



Figure 17. Full-scale survey demographics by airline type.



Figure 17. Full-scale survey demographics by airline type (continued).



Figure 17. Full-scale survey demographics by airline type (continued).



Figure 17. Full-scale survey demographics by airline type (continued).



Figure 17. Full-scale survey demographics by airline type (continued).



Figure 17. Full-scale survey demographics by airline type (continued).

Representativeness of sample. In order to determine whether a survey sample is representative of the population it was selected from, the demographics of the sample are typically compared to that of the population. However, no set of demographic data could be found on the population of trans-Atlantic air travelers. Given the diversity of nationalities and countries that respondents hailed from, use of a publicly available data source as a proxy such as U.S. or U.K census data was not feasible. Airs@t is a large-scale survey performed by M1nd-set on behalf of IATA, conducted in cooperation with airlines and airports worldwide, which involves surveying approximately 60,000 passengers per year in both short-haul and long-haul markets of all cabin classes. M1nd-set very generously provided demographic data from trans-Atlantic economy and premium economy travelers who had taken their 2017 Airs@t Survey. The Airs@t survey (M1nd-set, 2018) included FSC passengers from 11 airlines and was conducted at 18 airports: LAX, SEA, London-Heathrow, Atlanta, Dallas–Fort Worth, Detroit, New York–JFK, Newark, Miami, San Francisco, Washington–Dulles, Chicago, Paris, Amsterdam, Zurich, Frankfurt, Istanbul, and Rome. The Dissertation survey data (n = 1,345) was then compared with the Airs@t survey data (n = 14,571) with plots shown in Figure 18.

The majority of passengers surveyed flew in economy (93% of Dissertation, 86% of Airs@t), and the remaining passengers flew in premium economy (7% Dissertation, 14% Airs@t). The Dissertation survey had more female respondents (53%), whereas the Airs@t survey had more male respondents (58%). The Dissertation survey respondents tended to be younger than Airs@t respondents. While 54% of Dissertation respondents were 18 to 34, only 21% of Airs@t respondents were in that age range. While 20% of Dissertation respondents were age 55 and above, 36% of Airs@t respondents were in this age range. Regarding trip purpose, notable differences were observed between the Dissertation and Airs@t surveys. Respondents traveling for vacation constituted 67% of Dissertation respondents, whereas only 48% of Airs@t respondents were traveling for that purpose. Respondents traveling for work consisted of only 7% of Dissertation respondents; however, 28% of Airs@t respondents identified that same purpose. Both

the Dissertation and Airs@t surveys had 11 nationalities which each comprised 1% or more of the respondents. The Dissertation data set was fairly evenly balanced between British (37%) and Americans (33%), as the passengers surveyed were predominately traveling between the U.S. and London. The Airs@t data set had nearly four times as many Americans (40%) as British (11%).

It should be noted that the Dissertation survey had a narrower focus and was centered on only two airports (LAX and SEA) and predominately routes to Keflavík and London versus the depth and breadth of the Airs@t Survey. Since the Dissertation surveying was carried out in a three-month timeframe (August until October), the demographics could be susceptible to seasonal variation; whereas the Airs@t surveying was performed year round with the data collection balanced equally throughout all four quarters of 2017. While differences were noted between the Dissertation and Airs@t survey demographics, they were not deemed substantial.



Figure 18. Full-scale survey demographics versus Airs@t.



Figure 18. Full-scale survey demographics versus Airs@t (continued).



Figure 18. Full-scale survey demographics versus Airs@t (continued).
Descriptive Statistics

Table 9 shows the descriptive statistics for 25 Likert scale variables (n = 1,245) split by carrier type: LCLH (n = 692) or FSC (n = 553). Respondents who had flown an LCLH carrier had higher mean scores for the following variables: X8 Airfare, X11 Nonstop Flights, X12 Check-In, X15 Baggage Stowage, X16 Seat Assignment, X17 Cabin Design, X18 Cleanliness, X19 Legroom, X20 Seat Width, X21 Seat Comfort, and X22 Personal Space. The mode for the Likert scale questions was 4 = "Satisfied" for every variable for both LCLH and FSC.

Table 9

				Std.		
	Туре	Mean	Mode	Deviation	Skewness	Kurtosis
X8 AIRFARE	FSC	3.78	4	.779	641	.629
	LCLH	4.10	4	.790	894	1.080
X9 FREQUENCY	FSC	3.95	4	.639	458	1.135
	LCLH	3.83	4	.724	536	.795
X10 DEPARTURE &	FSC	4.03	4	.717	926	1.907
ARRIVAL TIMES	LCLH	3.97	4	.799	903	1.348
X11 NONSTOP FLTS	FSC	3.86	4	.918	900	.796
	LCLH	3.96	4	.945	756	.109
X12 CHECK-IN	FSC	4.04	4	.786	984	1.609
	LCLH	4.12	4	.796	-1.094	1.883
X13 BAGGAGE	FSC	3.94	4	.902	-1.051	1.264
POLICY	LCLH	3.33	4	1.188	374	843
X14 BOARDING	FSC	3.92	4	.805	611	.148
	LCLH	3.85	4	.850	826	.831
X15 BAGGAGE	FSC	3.93	4	.808	797	.837
STOWAGE	LCLH	3.99	4	.834	781	.687
X16 SEAT	FSC	3.31	4	1.041	481	527
ASSIGNMENT	LCLH	3.46	4	.998	483	425

Descriptive Statistics for Likert Scale Variables

Table 9 (continued)

				Std.		
	Туре	Mean	Mode	Deviation	Skewness	Kurtosis
X17 CABIN DESIGN	FSC	3.81	4	.796	713	.668
	LCLH	3.92	4	.812	674	.558
X18 CLEANLINESS	FSC	3.94	4	.787	921	1.278
	LCLH	4.08	4	.779	878	1.155
X19 LEGROOM	FSC	3.03	4	1.114	183	904
	LCLH	3.41	4	1.123	370	804
X20 SEAT WIDTH	FSC	3.26	4	1.030	444	635
	LCLH	3.46	4	1.021	504	460
X21 SEAT COMFORT	FSC	3.21	4	1.024	366	710
	LCLH	3.24	4	1.066	244	721
X22 PERSONAL SPACE	FSC	3.09	4	1.027	164	831
	LCLH	3.30	4	1.024	361	632
X23 PILOTS	FSC	3.78	4	.723	423	.510
	LCLH	3.75	4	.799	449	.235
X24 CABIN CREW	FSC	4.17	4	.737	961	1.667
	LCLH	3.78	4	.874	766	.556
X25 COURTESY &	FSC	4.23	4	.715	999	1.922
RESPONSIVENESS	LCLH	3.92	4	.856	809	.743
X27 SERVICE	FSC	4.14	4	.749	836	1.157
	LCLH	3.87	4	.871	750	.565
X29 RELIABILITY	FSC	4.08	4	.683	441	.310
	LCLH	3.97	4	.704	507	.640
X30 PUNCTUALITY	FSC	4.01	4	.741	766	1.051
	LCLH	3.95	4	.808	811	.887
X31 SAFETY	FSC	4.24	4	.607	226	304
	LCLH	4.13	4	.646	549	1.613
X32 IMAGE	FSC	4.07	4	.733	493	.230
	LCLH	3.94	4	.770	502	.392
X33 REPUTATION	FSC	4.04	4	.745	537	.334
	LCLH	3.87	4	.764	438	.447
X34 FLT BOOKING	FSC	4.02	4	.733	756	1.240
	LCLH	4.01	4	.828	-1.049	1.756

Exploratory Factor Analysis

Since LCLH and FSC passengers represented distinct subgroups, the data files were separated by carrier type and also utilized together for analysis. A total of 24 Likert scale variables were used for EFA. Since X8 Airfare was a distinct variable, and it was not intended to be part of the factor structure, it was omitted from EFA.

Assumptions testing. The KMO MSA exceeded the > .5 target for the individual variables, and for the full data set overall KMO MSA was .927. The Bartlett's Test of Sphericity was statistically significant at p = .000 level. Thus the intercorrelation requirements to perform EFA were met.

Factor extraction. The extraction method selected was Principal Component Analysis. The Varimax orthogonal rotation method with Kaiser Normalization was used. Two criteria were considered regarding the number of factors to extract: the latent root and the percentage of variance, as shown in Table 10. The *scree test criterion* was not utilized, since the plots were difficult to interpret and inconclusive. The *latent root criterion* retained factors with eigenvalues greater than 1 (Hair et al., 2010), and Factors 1–5 met this criterion for each data set (LCLH, FSC, and Both). The *percentage of variance criterion* was intended to achieve a particular cumulative percentage of variance extracted by successive factors (Hair et al., 2010). Utilizing the social sciences target of a solution accounting for 60% of the total variance (Hair et al., 2010), four factors sufficed for LCLH; however, five factors were needed for the FSC and Both data sets.

Factor Extraction

	E	igenvalu	es	Cumulative % of Variance				
Factor	LCLH	FSC	Both	LCLH	FSC	Both		
1	9.375	8.923	9.057	39.1%	37.2%	37.7%		
2	2.282	2.343	2.385	48.6%	46.9%	47.7%		
3	1.693	1.717	1.677	55.6%	54.1%	54.7%		
4	1.179	1.278	1.229	60.5%	59.4%	59.8%		
5	1.040	1.110	1.029	64.9%	64.0%	64.1%		
6	.846	.880	.856	68.4%	67.7%	67.6%		
7	.832	.802	.819	71.9%	71.1%	71.1%		
8	.693	.740	.730	74.8%	74.1%	74.1%		
9	.668	.699	.689	77.5%	77.1%	77.0%		
10	.629	.686	.636	80.2%	79.9%	79.6%		

Five factors were extracted on the basis of having eigenvalues > 1. The fixed number of factors extracted was adjusted to consider four factors (which proved to be too few, since two distinct factors were merged together into a single construct), and six factors (which proved to be too many). The best factor solution was achieved with five factors, since it satisfied the dual purposes of data reduction with factors standing in place of variables for further statistical analysis, and also it had practical significance by establishing a factor structure for passenger choice attributes.

The results will be shown as follows for LCLH, FSC, and Both (LCLH + FSC) data. The factor solution has proved to be fairly stable across data sets, although slight differences in factor structure related to cross-loadings were noted. The factor structure was also evaluated with and without outliers. Since the results were consistent and sufficient data was collected, the outliers were omitted from the analysis.

LCLH EFA. The five-factor solution had 65% of the variance explained, and for the initial rotated component matrix, the threshold for suppressing small coefficients was .3 to see the factor structure. Two variables had low communalities: X23 Pilots (.395) and X34 Flight Booking (.404), and their factor loadings were below .4, thus they warranted deletion. X12 Check In had a significant cross-loading, with both variables having coefficients above .4. EFA was rerun, first deleting X23 Pilots, followed by X34 Flight Booking, raising the threshold for suppressing small coefficients to .4. The variables with communalities below the .5 threshold were X12 Check In (.463) and X18 Cleanliness (.422). The two variables still exhibiting cross-loading issues were X12 Check In and X17 Cabin Design; nevertheless, the decision was made to retain both of these variables in the factor structure in order for the LCLH factor analysis to be comparable with other data sets. Thus the threshold for suppressing small coefficients was raised up to .45 in order to eliminate the cross-loadings on those two variables, which had the side effect of causing X18 Cleanliness to drop out of the factor structure due to its low factor loading. Table 11 shows the final factor structure for LCLH EFA.

LCLH – Varimax Rotated Component Matrix

	1	2	3	4	5
X9 FREQUENCY					.697
X10 DEP & ARR TIMES					.831
X11 NONSTOP FLTS					.680
X12 CHECK-IN				.451	
X13 BAG POLICY				.779	
X14 BOARDING				.528	
X15 BAG STOWAGE				.524	
X16 SEAT ASSIGN				.646	
X17 CABIN DESIGN		.468			
X18 CLEANLINESS					
X19 LEGROOM		.865			
X20 SEAT WIDTH		.865			
X21 SEAT COMFORT		.803			
X22 PERSONAL SPACE		.867			
X24 CABIN CREW			.864		
X25 COURTESY & RESP			.881		
X27 SERVICE			.848		
X29 RELIABILITY	.736				
X30 PUNCTUALITY	.735				
X31 SAFETY	.730				
X32 IMAGE	.795				
X33 REPUTATION	.780				

FSC EFA. The five-factor solution had 64% of the variance explained, and for the initial rotated component matrix, the threshold for suppressing small coefficients was .3 to see the factor structure. Two variables had low communalities: X23 Pilots (.288) and X34 Flight Booking (.333), plus they had no significant loadings (.4 or above). X18 Cleanliness has a cross-loading, with a mere .001 difference in loadings between Factors 3 and 4. X12 Check In had a cross-loading; however, there was greater differentiation. EFA was rerun, first deleting X23 Pilots, followed by X34 Flight Booking, and the threshold for suppressing small coefficients was raised to .4. However, cross-loadings remained for X12 Check In and X18 Cleanliness. The threshold for suppressing small

coefficients was raised to .45, which eliminated the X12 Check In cross-loading;

however, X18 Cleanliness fell out of the factor structure due to a low factor loading.

Table 12 shows the final factor structure for FSC EFA.

Table 12

FSC – Varimax Rotated (Component	t Matrix			
	1	2	2	4	

	1	2	3	4	5
X9 FREQUENCY					.778
X10 DEP & ARR TIMES					.749
X11 NONSTOP FLTS					.721
X12 CHECK-IN					.470
X13 BAG POLICY				.577	
X14 BOARDING				.643	
X15 BAG STOWAGE				.697	
X16 SEAT ASSIGN				.613	
X17 CABIN DESIGN				.529	
X18 CLEANLINESS					
X19 LEGROOM		.819			
X20 SEAT WIDTH		.840			
X21 SEAT COMFORT		.818			
X22 PERSONAL SPACE		.863			
X24 CABIN CREW			.817		
X25 COURTESY & RESP			.845		
X27 SERVICE			.833		
X29 RELIABILITY	.749				
X30 PUNCTUALITY	.785				
X31 SAFETY	.727				
X32 IMAGE	.812				
X33 REPUTATION	.806				

Both (LCLH + FSC) EFA. The five-factor solution had 64% of the variance explained, and for the initial rotated component matrix, the threshold for suppressing small coefficients was .3 to see the factor structure. Two variables had low communalities: X23 Pilots (.321) and X34 Flight Booking (.365), plus they had no significant loadings, thus they warranted deletion. X12 Check In had communality of

.452, which was also rather low, plus it had a significant cross-loading. EFA was rerun, first deleting X23 Pilots, followed by X34 Flight Booking, and the threshold for suppressing small coefficients was raised to .4. X12 was deleted from EFA, due to its cross-loading and having the lowest communality (.443), so the threshold for suppressing small coefficients was raised to .45. X12 would have dropped out of the factor structure anyway, if the threshold at which small coefficients were suppressed had been raised to eliminate the X17 cross-loading. Table 13 shows the final factor structure for Both (LCLH + FSC) EFA.

Table 13

	1	2	3	4	5
X9 FREQUENCY					.748
X10 DEP & ARR TIMES					.789
X11 NONSTOP FLTS					.716
X13 BAG POLICY				.601	
X14 BOARDING				.585	
X15 BAG STOWAGE				.679	
X16 SEAT ASSIGN				.650	
X17 CABIN DESIGN				.538	
X18 CLEANLINESS				.477	
X19 LEGROOM		.848			
X20 SEAT WIDTH		.862			
X21 SEAT COMFORT		.799			
X22 PERSONAL SPACE		.867			
X24 CABIN CREW			.857		
X25 COURTESY & RESP			.878		
X27 SERVICE			.851		
X29 RELIABILITY	.740				
X30 PUNCTUALITY	.758				
X31 SAFETY	.734				
X32 IMAGE	.812				
X33 REPUTATION	.795				

Both (LCLH + FSC) – Varimax Rotated Component Matrix

Factor structure. Table 14 shows the factor structure that was brought forth for the initial CFA. The following variables were not used for CFA: X18 Cleanliness, X23 Pilots, or X34 Flight Booking. While X12 Check In and X17 Cabin Design were candidates for deletion due to cross-loading issues, their exclusion resulted in Cronbach's alpha values below .7, thus they were needed to ensure reliability targets could be met. Since X12 and X17 loaded highest onto F3 for the Both (LCLH + FSC) EFA, that was their initial placement.

Table 14

Factor Structure for Initial CFA

				F5 Flight
F1 Operations	F2 Comfort	F3 Onboarding	F4 Service	Schedule
X29 Reliability X30 Punctuality X31 Safety X32 Image X33 Reputation	X19 Legroom X20 Seat Width X21 Seat Comfort X22 Personal Space	X12 Check-In X13 Bag Policy X14 Boarding X15 Bag Stow X16 Seat Assign X17 Cabin Design	X24 Cabin Crew X25 Court & Resp X27 Service	X9 Frequency X10 Dep & Arr X11 Nonstop

Cronbach's alpha. Since a common factor structure was needed for both LCLH and FSC data, Cronbach's alpha was tested with the proposed factor structure achieved by the Both EFA (LCLH + FSC). All Cronbach's alpha values for LCLH, FSC, and Both (LCLH + FSC) met the target of > .7 as shown in Table 15.

				LCLH	FSC	BOTH
#	Factor	Variables	N	α	α	α
1	Operations	X29, X30, X31, X32, X33	5	.900	.904	.902
2	Comfort	X19, X20, X21, X22	4	.911	.899	.905
3	Onboarding	X12, X13, X14, X15, X16, X17	6	.783	.767	.769
4	Service	X24, X25, X27	3	.921	.918	.924
5	Flight Schedule	X9, X10, X11	3	.720	.736	.726

Cronbach's Alpha for Initial CFA

Confirmatory Factor Analysis

CFA was performed using AMOS with the Both (LCLH + FSC)—no outliers data set to establish a common factor structure. Table 16 shows the fit for each model, and Figure 19 shows the input path diagram for Model 6, which was chosen.

- → Model 1: Baseline Model. In evaluating the error covariances, two stood out:
 e30 Punctuality ← > e29 Reliability (MI of 154) and e33 Reputation ← > e32
 Image (MI of 182). In both cases, the root cause of the error covariances was variables with overlapping or interrelated content. An error covariance was added for e33 ← > e32, which held the highest MI.
- → Model 2: Added error covariance for e33 Reputation ← → e32 Image. Two error covariances stood out: e13 Baggage Policy ← → e17 Cabin Design (MI of 36) and e14 Boarding ← → e17 Cabin Design (MI of 40). Regarding crossloadings, X17 Cabin Design ← F2 Comfort stood out (MI of 39). Since both of the error covariances and the cross-loading implicated X17 Cabin Design, it was deleted.

- → Model 3: Deleted X17 Cabin Design. In evaluating the error covariances, two stood out: e32 Image ← → e31 Safety (MI 25) and e30 Punctuality ← → e29 Reliability (MI of 28). An error covariance was added for the two error terms which both had the highest MI value and the closest relationship: e30 Punctuality ← → e29 Reliability.
- → Model 4: Added error covariance for e30 Punctuality ← → e29 Reliability.
 In evaluating the error covariances e21 Seat Comfort ← → e19 Legroom (MI 20)
 and e30 Punctuality ← → e14 Boarding (MI 28), both stood out. Although the MI
 was lower, adding an error covariance e21 Seat Comfort ← → e19 Legroom was
 appropriate to avoid adding an error covariance for variables on different
 constructs.
- → Model 5: Added error covariance for e21 Seat Comfort ← → e19 Legroom.
 In evaluating the error covariances e30 Punctuality ← → e14 Boarding (MI of 28),
 this proved to be such a standout value that, in order to improve model fit, the
 covariance for error terms of two different constructs was added.
- → Model 6: Added error covariance for e30 Punctuality ← → e14 Boarding. In evaluating cross-loadings X16 Seat Assignment ← F2 Comfort (MI 23), this was shown to be the most standout value. Since the MI value was relatively low, the decision was made to retain X16, as model fit was nearly perfect (CMIN/df only .10 above target).

CFA Model Fit Progression	n
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Model	Change	Chi ²	df	Probability Level	CFI	GFI	AGFI	NFI	CMIN/df	RMSEA
1	Baseline	1,209	179	<i>p</i> = .000	.933	.908	.882	.922	6.76	.068
2	e33 ←→ e32	796	178	<i>p</i> = .000	.960	.941	.924	.949	4.47	.053
3	Deleted X17	583	159	<i>p</i> = .000	.971	.956	.942	.961	3.67	.046
4	e30 ←→ e29	543	158	<i>p</i> = .000	.974	.958	.945	.963	3.44	.044
5	e21 ←→ e19	512	157	<i>p</i> = .000	.976	.961	.948	.965	3.26	.043
6	e30 ←→ e14	483	156	<i>p</i> = .000	.978	.963	.950	.967	3.10	.041



Figure 19. Model 6 CFA input path diagram.

Convergent validity. Convergent validity is the "extent to which indicators of a specific construct converge or share a high proportion of variance in common" (Hair et al., 2010, p. 669), which can be evaluated by factor loadings, average variance extracted (AVE), and/or reliability, as shown in Table 17. Convergent validity was achieved on the basis of factor loadings. While the variables comprising F3 Onboarding and F5 Flight Schedule met the target for factor loadings of \geq .5, the variables comprising the remaining factors (F1 Operations, F2 Comfort, F4 Service) had excellent loadings, all exceeding .7. The construct reliability target of .7 was met for all factors. The Cronbach's alpha target value of .7 or higher was achieved for all factors (Nunnally, 1978). F1 Operations, F2 Comfort, and F4 Service met the target of \geq .5 for AVE; however, F3 Onboarding and F5 Flight Schedule did not achieve this.

Discriminant validity. Discriminant validity is the "extent to which a construct is truly distinct from other constructs both in terms of how much it correlates with other constructs and how distinctly measured variables represent only this single construct" (Hair et al., 2010, p. 669). In Table 18, AVE was shown on the diagonal in bold font, and then the square correlations of the factors or maximum shared variance (MSV) in the remaining cells. Discriminant validity was met for pairs of factors when MSV < AVE. Discriminant validity was poor for F1 Operations $\leftarrow \rightarrow$ F3 Onboarding and F3 Onboarding $\leftarrow \rightarrow$ F5 Flight Schedule, thus these pairs of constructs did not have sufficient differentiation. However, Kline (2015) noted that since the square correlations of the factors were < .9, discriminant validity would not be of concern.

Convergent Validity of CFA

	Std. Factor	Construct	Cronbach's	Average
Factor/Variables	Loadings	Reliability	Alpha	Variance Extracted
F1 Operations		.938	.902	.620
X29 Reliability	.822			
X30 Punctuality	.704			
X31 Safety	.806			
X32 Image	.804			
X33 Reputation	.794			
F2 Comfort		.901	.905	.720
X19 Legroom	.834			
X20 Seat Width	.855			
X21 Seat Comfort	.843			
X22 Personal Space	.862			
F3 Onboarding		.772	.732	.373
X12 Check-In	.592			
X13 Bag Policy	.577			
X14 Boarding	.696			
X15 Bag Stowage	.649			
X16 Seat Assign	.525			
F4 Service		.947	.924	.805
X24 Cabin Crew	.874			
X25 Courtesy & Resp	.933			
X27 Service	.883			
F5 Flight Schedule		.813	.726	.491
X9 Frequency	.724			
X10 Dep & Arr Times	.739			
X11 Nonstop Flights	.634			

Table 18

Discriminant Validity of CFA

	F1	F2	F3	F4	F5
F1	.620				
F2	.174	.720			
F3	.527	.264	.373		
F4	.376	.112	.300	.805	
F5	.393	.114	.458	.132	.491

Passenger Choice of LCLH or FSC

For this analysis, the sample size of n = 1,245 consisted of LCLH (n = 692) and FSC (n = 553) cases. Variance inflation factor was evaluated for the LCLH, FSC, and Both (LCLH + FSC) data sets; multicollinearity not of concern, since all values were below four. The following demographics and traveler characteristics were included in both models as independent variables: gender, age, education, income, class of service, travel frequency, and trip purpose. The dependent dichotomous variable was choice of airline: LCLH = 1 or FSC = 0. The factor/variable selection method for logistic regression was Forward Stepwise: Likelihood Ratio (LR). The Probability for Stepwise values was: .05 for Entry, .10 for Removal, and .50 Classification Cutoff. Factors/variables were added one-by-one, starting with the statistically significant variable that had the highest score statistic (reduction in -2LL value).

Model 1: logistic regression – **factors**. The initial logistic regression considered five independent factors: F1 Operations, F2 Comfort, F3 Onboarding, F4 Service, and F5 Flight Schedule plus one independent variable: X8 Airfare. Table 19 shows the model summary results. Chi² indicated statistically significant values, as each variable was added in turn (per step), and the overall model was also statistically significant. The -2LL value declined from 1,710 at Step 0 to 1,488 at Step 6. Pseudo R^2 values showed improvement at each step in the model, with final values .163 for Cox and Snell and .219 for Nagelkerke.

Model 1 Summary

		Step	Step	Model	Model	Cox & Snell	Nagelkerke
Variables Entered	-2LL	Chi	Sig.	Chi	Sig.	R ²	R ²
Step 0	1,/10						
Constant	1.657	52	000	62	000	0.42	056
Step 1	1,657	53	.000	53	.000	.042	.056
F4 Service							
Constant	1.570	70	000	121	000	100	12.4
Step 2	1,579	78	.000	131	.000	.100	.134
F4 Service							
X8 Airfare							
Constant	1 6 4 7	22	000	164	000	102	165
Step 3	1,547	32	.000	164	.000	.123	.165
F4 Service							
X8 Airfare							
Age							
Constant	1 6 1 7	20	000	102	000	144	102
Step 4	1,517	29	.000	193	.000	.144	.193
F2 Comfort							
F4 Service							
X8 Airfare							
Age							
Constant	1 400	10	000	212	000	156	200
Step 5	1,498	18	.000	212	.000	.156	.209
F2 Comfort							
F4 Service							
X8 Airfare							
Age							
Class (Economy)							
Constant Sterr (1 400	10	001	222	000	1(2	210
E2 Comfort	1,488	10	.001	222	.000	.103	.219
F2 Connort							
F5 Flight Schedule							
X8 Airfare							
Class (Economy)							
Constant							
Constant							

The Hosmer and Lemeshow Test split up the cases into six classes, comparing actual and predicted values of the dependent variable (passenger choice of LCLH or FSC) with the Chi² value. The intent was to have statistically insignificant differences (p > .05) between the actual and predicted values, which was achieved for all steps.

Table 20 shows that in Step 1, the percentage of correct classification or accuracy of airline type for FSC was 36.7%, which by Step 6 improved to 57.5%. LCLH classification held nearly constant, with a final value of 76.4%. The overall hit ratio (correct classification) was 68%.

Table 20

			Predicted				
			TY	PE			
	Observed	I	FSC	LCLH	Correct		
Step 1	TYPE	FSC	203	350	36.7%		
		LCLH	164	528	76.3%		
	Overall				58.7%		
Step 6	TYPE	FSC	318	235	57.5%		
		LCLH	163	529	76.4%		
	Overall				68.0%		

Model 1 Classification Table

Per the Wald statistic, all of the factor/variable coefficients for Step 6, as shown in Table 21, held statistical significance, and thus could predict choice of LCLH or FSC. Original coefficients with a positive sign (F2 Comfort, X8 Airfare, Economy Class) *increased* and a negative sign (F4 Service, F5 Flight Schedule, Age) *decreased* the probability of LCLH carrier choice. The exponentiated coefficients show the magnitude of relationships, and the percent change in odds is the (exponentiated coefficient value -1) x 100. Regarding airline service attributes, the most important predictor was X8 Airfare (+110% change in odds), followed by F2 Comfort (+75% change in odds), F4

Service (-61.4% change in odds), and F5 Flight Schedule (-38.7% change in odds). The regression equation utilizing the exponentiated coefficients was the following:

$$Odds = e^{b0 + b1comfort + b2service + b3schedule + b4airfare + b5age + b6class},$$
(4)

$$Odds = e^{1.805 + 1.750comfort + .386service + .613schedule + 2.101airfare + .824age + 2.927class}.$$
 (5)

Table 21

		В	S.E.	Wald	Sig.	Exp(B)
Step 6	F2 COMFORT	.560	.087	41.735	.000	1.750
	F4 SERVICE	951	.113	71.191	.000	.386
	F5 FLT SCHEDULE	490	.156	9.854	.002	.613
	X8 AIRFARE	.743	.096	59.875	.000	2.101
	AGE	193	.040	23.237	.000	.824
	CLASS (ECONOMY)	1.074	.257	17.414	.000	2.927
	Constant	.590	.586	1.014	.314	1.805

Model 1 Coefficients

Model 2: logistic regression – variables. For this model, 25 independent Likert scale variables were used. Chi² indicated statistically significant values as each variable was added in turn (per step), and the overall model was also statistically significant, as shown in Table 22. The -2LL value declined from 1,710 at Step 0 to 1,247 at Step 15. Two pseudo R^2 values were calculated: Cox and Snell (.311) and Nagelkerke (.416) for final values, with improvement shown over Model 1.

Step	-2LL	Step Chi ²	Step Sig.	Model Chi ²	Model Sig.	Cox & Snell R ²	Nagelkerke R ²
0	1,710						
1	1,615	96	.000	96	.000	.074	.099
5	1,385	32	.000	325	.000	.230	.308
10	1,281	15	.000	429	.000	.291	.390
15	1,247	4	.046	463	.000	.311	.416

The Hosmer and Lemeshow Test showed statistically insignificant differences (p > .05) between the actual and predicted values for all steps—except for 1, 2, and 4. FSC classification shown in Table 23 improved from 25.3% in Step 1 to 70.9% in Step 15. Overall classification accuracy was 75.3% for the final step, which was a 7% improvement over the previous model.

Table 23

Model 2 Classification Table

	5		Predicted				
			TY	PE			
	Observed		FSC	LCLH	Correct		
Step 1	TYPE	FSC	140	413	25.3%		
		LCLH	111	581	84.0%		
	Overall				57.9%		
Step 15	TYPE	FSC	392	161	70.9%		
		LCLH	146	546	78.9%		
	Overall				75.3%		

Per the Wald statistic, all of the factor or variable coefficients for Step 15 held statistical significance as shown in Table 24, and could be important in predicting passenger choice of LCLH or FSC. Original coefficients with a positive sign (Economy Class, X8 Airfare, X11 Nonstop Flights, X12 Check In, X15 Baggage Stowage, X16 Seat Assignment, X18 Cleanliness, X19 Legroom) *increased* and a negative sign (Age, Education, X9 Frequency, X13 Baggage Policy, X21 Seat Comfort, X24 Cabin Crew, and X33 Reputation) *decreased* the probability of LCLH carrier choice. Class of Service (+241% change in odds) was the most important predictor, followed by X8 Airfare (+125% change in odds), X12 Check In (+70% change in odds), and X19 Legroom (+61% change in odds).

Table 24

Model 2 Coefficients

Mouel 2						
		В	S.E.	Wald	Sig.	Exp(B)
Step 15	AGE	213	.045	22.283	.000	.808
	EDUCATION	232	.084	7.700	.006	.793
	CLASS (ECONOMY)	1.226	.290	17.814	.000	3.407
	X8 AIRFARE	.812	.110	54.499	.000	2.252
	X9 FREQUENCY	667	.132	25.391	.000	.513
	X11 NONSTOP FLTS	.337	.094	12.909	.000	1.401
	X12 CHECK-IN	.530	.107	24.726	.000	1.698
	X13 BAG POLICY	934	.090	108.606	.000	.393
	X15 BAG STOWAGE	.212	.106	3.964	.046	1.236
	X16 SEAT ASSIGN	.346	.083	17.420	.000	1.414
	X18 CLEANLINESS	.389	.112	12.026	.001	1.476
	X19 LEGROOM	.476	.088	29.127	.000	1.609
	X21 SEAT COMFORT	193	.095	4.101	.043	.825
	X24 CABIN CREW	912	.114	64.227	.000	.402
	X33 REPUTATION	353	.119	8.752	.003	.702
	Constant	.095	.686	.019	.890	1.100

To evaluate if X37 Food and Beverage was a predictor of passenger choice of carrier, 90 cases with N/A responses were deleted; and the same logistic regression analysis noted above in Model 2 using variables was rerun. X37 was a predictor that decreased choice of LCLH. The B value was -.699 and Exp(B) was .497 (-50% change

in odds). The 39 cases with N/A for X39 Baggage Handling were deleted, so that variable could be included in logistic regression. However, X39 did not play a role in the logistic regression equation.

Willingness to Switch from LCLH to FSC

The purpose of this statistical analysis was to identify which factors and/or variables (and demographics) determined a passenger's willingness to switch (WTS) from an LCLH to an FSC. Eight cases were deleted due to unusable data (reasons included passengers selected Other for airline, so they were misclassified as FSC passengers and given the incorrect switching question; outliers, or lacked willingness to pay amount), and 18 cases were deleted from other LCLH carriers (LEVEL and WestJet). The sample size utilized in this analysis was n = 666, with 45% of respondents (n = 301) willing to switch (WTS) from LCLH to FSC, and 55% of respondents (n = 365) unwilling to do so. The following demographics and traveler characteristics were included as independent variables: gender, age, education, income, class of service, travel frequency, trip purpose, and choice of LCLH carrier (Norwegian or WOW air). The dependent dichotomous variable was the switching decision: 1 = Yes, 0 = No. Two analyses were performed: logistic regression and decision tree, which were then run separately using the Likert variables and then once again with the underlying factors. Since the most meaningful insights were achieved with decision tree analysis, only those results will be reported.

Model 3: decision tree – factors. The decision tree analysis was performed by using the Exhaustive CHAID (Chi-squared Automatic Interaction Detection) growing method. The significance level was .05 for splitting nodes, and the Chi-square Statistic was LR. The growth limits were a maximum tree depth of 10; and the minimum number of cases was 30 for parent and 15 for child nodes. The decision tree is shown in Figure 20. The target variable was WTS from an LCLH to an FSC (Yes/No). The effects of impact factors/variables (X8 Airfare, Income, Education, Age, Gender, F2 Comfort, and F1 Operations) on the probability of WTS will be interpreted below.

- → *Root Node:* 45% of LCLH respondents WTS to an FSC, whereas 55% were not.
- → X8 Airfare Node: The most important predictor variable was X8 Airfare: 28% of LCLH respondents who were Very Dissatisfied/Dissatisfied, 50% of respondents who were Neutral/Satisfied, and 38% who were Very Satisfied with Airfare were WTS to an FSC.
- → Income Node: Income was the most important predictor for LCLH respondents who were Neutral/Satisfied with X8 Airfare: 35% of those earning less than \$25,000 versus 55% earning \$25,000 or more were WTS to an FSC.
- → Age Node: For LCLH respondents earning \$25,000 or more, Age was the key predictor, with 58% of those 18 to 34, 44% of those 35 to 54, and 60% of those 55+ being WTS to an FSC.
- → F2 Comfort Node: For LCLH respondents Age 55+, F2 Comfort was a predictor, with 74% who were Very Dissatisfied/Dissatisfied/Neutral versus 28% who were Satisfied/Very Satisfied with Comfort being WTS to an FSC.

- → F1 Operations Node: LCLH respondents who were Very
 Dissatisfied/Dissatisfied/Neutral with F2 Comfort had F1 Operations as a
 predictor of WTS: 94% of those Very Dissatisfied/Dissatisfied/Neutral versus
 58% of those Satisfied/Very Satisfied with Operations were WTS to an FSC.
- → Education Node: For LCLH respondents who were Very Satisfied with X8
 Airfare, Education was a key predictor variable, with 42% of those with a
 Bachelor's Degree or less, versus 22% of advanced degree holders WTS to an FSC.
- → Gender Node: LCLH respondents who held advanced degrees and were Very Satisfied with X8 Airfare had Gender as a predictor variable: 12% of Females versus 37% of Males were WTS to an FSC.

The predictive accuracy of the decision tree was .377, and the standard error was .019. The classification accuracy was 45% correct for yes, and 76% correct for no, thus 62% overall. Therefore, the decision tree was better at predicting passengers who did not want to switch to an FSC.



Figure 20. Decision tree for willingness to switch from LCLH to FSC.

Willingness to Pay to Switch from LCLH to FSC

Next, here is the analysis for Amount Willing to Pay (WTP) to switch from an LCLH to an FSC (n = 305), with summary statistics shown in Table 25. The highest frequency for increase in Amount WTP was \$100, with 108 passengers specifying this

amount, followed by \$50 (46 passengers), \$200 (37 passengers), and \$150 (35

passengers). The increase in the Amount WTP histogram is shown in Figure 21, and for ease of interpretation, it does not show two responses (\$1,500 and \$2,334).

Table 25

Increase in Amount Willing to Pay						
			Standard			
Minimum	Maximum	Mean	Deviation			
\$1	\$2,334	\$140	\$189			



Figure 21. Increase in amount willing to pay to switch to FSC.

The purpose of this statistical analysis was to identify which factors and/or variables (and demographics) affected the increase in Amount WTP to switch from an LCLH to an FSC. Four cases were removed (one LEVEL and three WestJet) so choice

of LCLH (Norwegian or WOW air) could be utilized in the analysis, leaving a remaining sample size of n = 301. The dependent variable, Increase in Amount WTP, did not have a normal distribution (as noted by the P–P plot). Thus multiple linear regression did not yield acceptable results, as anticipated. Next, multinomial logistic regression was performed, converting the dependent variable Amount WTP into three groups on the basis of WTP more (in U.S. dollar amounts). The results were complex to interpret due to the presence of multi-level independent variables; and furthermore, the findings were inconsistent in comparing the reference group to the second and third groups. Since the dependent variable, Increase in Amount WTP, was most similar to a discrete/dichotomous variable, binomial logistic regression led to results, which offered clarity, thus only those results will be reported.

Model 4: logistic regression – factors/variables. The following demographic and trip/traveler characteristics were included as independent variables: gender, age, education, income, class of service, travel frequency, trip purpose, and LCLH airline (Norwegian or WOW air). The continuous dependent variable, Increase in Amount WTP, was converted into a binary variable based upon the increased U.S. dollar amount that respondents were WTP in round-trip airfare to switch. Amount WTP was split into two groups: 0 = \$1 to \$130, 1 = \$131 to \$2,334. The logistic regression was run using five independent factors: F1 Operations, F2 Comfort, F3 Onboarding, F4 Service, and F5 Flight Schedule, plus one independent variable: X8 Airfare; and again with 25 Likert variables, with the same results achieved. The factor/variable selection method for logistic regression was Forward Stepwise: LR. The Probability for Stepwise values was: .05 for Entry, .10 for Removal, and .50 Classification Cutoff.

Chi² indicated statistically significant values, as each variable was added in turn (per step), and the overall model was also statistically significant. The -2LL value declined from 416 at Step 0 to 217 at Step 4. Pseudo R^2 values showed improvement at each step in the model. The final values were .483 for Cox and Snell and .645 for Nagelkerke. The Hosmer and Lemeshow Test showed statistically insignificant differences (p > .05) between the actual and predicted values of the dependent variable (Amount WTP) for all steps. Overall classification accuracy was 96% for Amount WTP \$130, 70% for Amount WTP \$131 to \$2,334, and 82% overall.

Per the Wald statistic, three of the factor/variable coefficients for Step 4 held statistical significance as shown in Table 26, and thus could predict Amount WTP: Age, Education, and Class; however, LCLH Airline (Norwegian or WOW air) did not have statistical significance. Original coefficients with a positive sign (Age) *increased* and a negative sign (Education, Class of Service Economy) *decreased* the probability of selecting a higher Amount WTP (\$131 to \$2,334) to switch to an FSC. Class of Service Economy (-78% change in odds) was the most important predictor, followed by Education (-50% change in odds) and Age (+23% change in odds).

		В	S.E.	Wald	Sig.	Exp(B)
Step 4	AGE	.209	.105	3.999	.046	1.233
	EDUCATION	697	.238	8.539	.003	.498
	CLASS (ECONOMY)	-1.530	.764	4.013	.045	.217
	AIRLINE (NORWEGIAN)	-22.522	3812.510	.000	.995	.000
	Constant	23.806	3812.510	.000	.995	2.181E+10

Willingness to Switch from FSC to LCLH

The purpose of this statistical analysis was to identify which factors and/or variables (and demographics) determined a passenger's WTS from an FSC to an LCLH carrier. One case was deleted due to unusable data. The sample size utilized in this analysis was n = 552, with 24% of respondents (n = 132) being WTS from FSC to LCLH and 76% (n = 420) not willing to do so. While logistic regression was also performed, since the most meaningful insights were achieved with decision tree analysis, only those results will be reported.

Model 5: decision tree – factors. The decision tree analysis was performed utilizing the Exhaustive CHAID growing method. The significance level was .05 for splitting nodes, and the Chi-square Statistic was LR. The growth limits were a maximum tree depth of 10; and the minimum number of cases was 20 for parent and 10 for child nodes. The decision tree is shown in Figure 22. The target variable was WTS from an FSC to an LCLH carrier (Yes/No). The effects of impact factors/variables (Gender, F4 Service, X8 Airfare, and F3 Onboarding) on the probability of WTS will be interpreted below.

- → Root Node: 24% of FSC respondents were WTS to an LCLH carrier, whereas 76% were not.
- → Gender Node: The most important variable for FSC respondents was Gender:
 18% of Females and 31% of Males were WTS to an LCLH carrier.
- → F4 Service Node: For Female FSC respondents, the most important predictor of WTS was F4 Service: 25% who were Very Dissatisfied/Dissatisfied/Neutral; 8% who were Satisfied; and 21% who were Very Satisfied with Service were WTS to an LCLH carrier.
- → X8 Airfare Node: For Female FSC respondents who were not satisfied with F4
 Service, X8 Airfare was the key predictor variable: 37% of those Very
 Dissatisfied/Dissatisfied/Neutral, 21% of those Satisfied, and 0% of those who were Very Satisfied with Airfare were WTS to an LCLH carrier.
- → F3 Onboarding Node: For Female FSC respondents who were not satisfied with F4 Service but were Satisfied with X8 Airfare, F3 Onboarding predicted their WTS: 13% of respondents who were Very Dissatisfied/Dissatisfied/Neutral, versus 50% who were Satisfied/Very Satisfied with Onboarding were WTS to an LCLH carrier.

The predictive accuracy of the decision tree was .239, and the standard error was .018. The classification accuracy was 76% overall.



Figure 22. Decision tree for willingness to switch from FSC to LCLH.

Willingness to Pay to Switch from FSC to LCLH

This data set consisted of FSC passengers who were WTS to an LCLH, with four cases deleted (no WTP amount given), leaving the remaining sample size at n = 128. Summary statistics are shown in Table 27. The highest frequency for decrease in Amount WTP was \$200 (28 passengers), followed by \$100 (22 passengers) and \$300 (21 passengers). The histogram is shown in Figure 23.

Table 27

Decrease in Amount Willing to Pay

Minimum	Maximum	Mean	Standard Deviation
\$50	\$1,000	\$276	\$185



Figure 23. Decrease in amount willing to pay to switch to LCLH.

The purpose of this statistical analysis was to identify which factors and/or variables (and demographics) affected the decrease in Amount WTP to switch from an FSC to an LCLH carrier. For the aforementioned reasons noted, the results of multiple linear regression (due to linearity assumption not met for the dependent variable) and multinomial logistic regression (difficult to interpret results) will not be reported here; only the results of binomial logistic regression will be stated.

Model 6: logistic regression – variables. The following demographic and trip/traveler characteristics were included in both models as independent variables: gender, age, education, income, class of service, travel frequency, and trip purpose. The continuous dependent variable, Decrease in Amount WTP, was converted into a binary variable based upon the U.S. dollar amount that the respondents would be WTP less in airfare to switch. Decrease in Amount WTP was split into two groups: 0 = \$50 to \$200, 1 = \$250 to \$1,000. The factor/variable selection method for logistic regression was Forward Stepwise: LR. The Probability for Stepwise values was: .05 for Entry, .10 for Removal, and .50 Classification Cutoff. Logistic regression was performed with 25 Likert variables, since when the analysis was run with factors, none were included. Chi² indicated statistically significant values as each variable was added in turn (per step), and the overall model was also statistically significant. The -2LL value declined from 177 at Step 0 to 162 at Step 3. Pseudo R^2 values showed improvement at each step in the model. The final values were .113 for Cox and Snell and .151 for Nagelkerke. The Hosmer and Lemeshow Test showed statistically insignificant differences (p > .05) between the actual and predicted values of the dependent variable (Amount WTP) for all steps. Overall

classification accuracy was 76% for Amount WTP \$50 to \$200, 52% for Amount WTP \$250 to \$1,000, and 65% overall.

Per the Wald statistic, all of the variable coefficients for Step 3 as shown in Table 28 held statistical significance and could predict Amount WTP. Original coefficients with a positive sign (X11 Nonstop Flights) *increased* and a negative sign (X8 Airfare, X25 Courtesy & Responsiveness) *decreased* the probability of selecting a Decrease in Amount WTP (\$250 to \$1,000) to switch to an LCLH carrier. The variables were comparable predictors with X8 Airfare and X25 Courtesy and Responsiveness (+50% change in odds) and X11 Nonstop Flights (-55% change in odds).

Table 28

		В	S.E.	Wald	Sig.	Exp(B)
Step 3	X8 AIRFARE	699	.253	7.630	.006	.497
X11 NONSTOP FLTS	X11 NONSTOP FLTS	.440	.215	4.202	.040	1.553
	X25 COURTESY & RESP	698	.295	5.594	.018	.498
	Constant	3.675	1.382	7.073	.008	39.453

Model 6 Coefficients

Qualitative Open-Ended Questions

The responses to the qualitative open-ended questions were coded separately in Excel in four groups depending upon which carrier type the passengers had flown, followed by whether or not they would be willing to switch. The results will be organized such that the qualitative responses will be analyzed first for passengers who had a preference for an LCLH carrier (LCLH loyal or willing to switch to an LCLH) followed by those who preferred an FSC (FSC loyal or willing to switch to an FSC). Passengers who left the response field blank, stated they had no opinion, provided an unintelligible response, or who gave a response which could not be classified were not noted in the results.

Preference for LCLH carrier. Open-ended comments from 356 respondents were used in the analysis regarding why they would remain loyal to LCLH; nine passengers were non-respondents and 14 had provided uncodable responses. Open-ended comments from 125 respondents were used in the analysis explaining why they would switch to LCLH; four passengers were non-respondents, and three had provided uncodable responses. Fiscal reasons were the prime motivator for remaining loyal to an LCLH (286 respondents, 80% mentioned this) or willingness to switch to an LCLH carrier (97 respondents, 77% mentioned this). Each response that fit that criterion was further classified into one of nine subgroups as shown in Figures 24 and 25. The categories included cost, preference for unbundled/a la carte, limited finances, flying an FSC being too expensive, flying an LCLH carrier made their vacation possible, preference to spend less on airfare and more on vacation, no-frills travelers, price-sensitive students, LCLH carriers offered greater value, or flying an LCLH carrier would enable them to travel more.

Figure 26 notes reasons why LCLH passengers would remain loyal, whereas Figure 27 notes reasons why FSC passengers would switch to LCLH. Many passengers noted they would pack lightly and bring their own food and beverage when traveling with an LCLH carrier. Passengers noted they preferred to select what services they needed. Operations consisted of attributes such as safety, reputation, and dependability. Regarding convenience, some passengers were willing to endure inconvenient travels for a lower fare, whereas others would take into account whether nonstop service was offered on an LCLH carrier. Travelers also noted that an LCLH experience could be at least as good, if not better, than an FSC experience, which was based upon prior experiences flying LCSH or LCLH carriers.

Preference for FSC. Open-ended comments from 394 respondents were used in the analysis regarding why they would remain loyal to an FSC; 13 passengers were non-respondents and 13 had provided uncodable responses. Figure 28 shows key reasons why FSC passengers would remain loyal including disdain for hidden fees, preference for a bundled offering, LCLH not necessarily less expensive than an FSC, and preference for services and amenities for a long-haul flight. Open-ended comments from 283 respondents were used in the analysis explaining why they would switch to an FSC; six passengers were non-respondents, and 16 had provided uncodable responses. Figure 29 shows reasons why LCLH passengers would switch to an FSC. Food and beverage was their chief consideration, followed by convenience, comfort, and baggage. LCLH passengers who would switch to an FSC less commonly cited IFE, seat assignment, and pillow and blanket as reasons.



Figure 24. Fiscal reasons why LCLH passengers would remain loyal.



Figure 25. Fiscal reasons why FSC passengers would switch to LCLH.


Figure 26. Reasons why LCLH passengers would remain loyal.



Figure 27. Reasons why FSC passengers would switch to LCLH.



Figure 28. Reasons why FSC passengers would remain loyal.



Figure 29. Reasons why LCLH passengers would switch to FSC.

Word clouds for LCLH passengers. In order to look at the open-ended comments in a different way, word clouds were created, the sizes of the words themselves signifying their relative importance, as smaller words occurred less frequently and larger words more frequently. The airplane word cloud in Figure 30 contains words from LCLH passengers regarding why they would remain loyal. Fiscally related words, which took center stage, included cost, cheaper, money, budget, value, and student. Words signifying why passengers were pleased with LCLH included: choose, options, better, happy, like, and plane.



Figure 30. Why LCLH passengers would remain loyal. Image generated using Zygomatic WordCloud software, 2017.

The suitcase word cloud in Figure 31 contains words from LCLH passengers who would switch to an FSC. Words such as easier, ease, and inclusive were used to signify the convenience of the FSC offering. Services and amenities were the core items mentioned by passengers regarding why they would switch to FSC: luggage, suitcase,

meals, snacks, beverage, water, pillows, blankets, service, staff, free, and extras. Long was central to the word cloud, indicating the impact of long-haul travel.



Figure 31. Why LCLH passengers would switch to an FSC. Image generated using Zygomatic WordCloud software, 2017.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter discussed the results of the passenger survey research including identification of a factor structure, what variables/factors affected a passenger's choice of an LCLH or an FSC, a passenger's willingness to switch from LCLH $\leftarrow \rightarrow$ FSC, a passenger's willingness to pay to switch from LCLH $\leftarrow \rightarrow$ FSC, and open-ended comments. The discussion was structured by research questions followed by a summary of LCLH vs. LCSH findings. Next, after a discussion of the resiliency of LCLH carriers, conclusions which include theoretical contributions, practical implications, and limitations were discussed. Then the recommendations were shared, followed by suggestions for future research.

Discussion of RQ 1 – Factor Structure

What were the underlying constructs for passengers' evaluation of their trans-Atlantic air travel experiences, comprised of passenger satisfaction attributes?

The factor structure consisted of X8 Airfare along with five factors: F1 Operations, F2 Comfort, F3 Onboarding, F4 Service, and F5 Flight Schedule. A shared factor structure for LCLH and FSC was necessary to achieve the key objective of data reduction. Several variables were omitted from consideration, either because both LCLH and FSCs did not offer those amenities or services, or due to a large amount of N/A responses. Two passenger surveys which also utilized EFA were selected as a basis for comparison. Chen and Chao (2015) determined which factors affected airline choice of Chinese and Taiwanese passengers, whereas Min and Min (2015) considered U.S. airline service quality. Table 29 shows a comparison chart with variables common to the dissertation and scholarly literature factor structures shaded in cyan, with variables considered in the dissertation but not within the factor structure shaded in gray.

Table 29

Factor Structure Comparison C	Cnart
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Dissertation	Chen & Chao (2015)	Min & Min (2015)
X8 Airfare	Price	Service Recovery
F1 Operations	Price	Alternative Elight
X29 Reliability	Thee	Reasonable Follow-Un
X30 Punctuality	Ground Services	Reasonable Fonow-Op
X31 Safety	Problem Solving	Service Assurance
X32 Image	Ground Staff	Safety
X33 Reputation	Cabin Crew	Punctuality
noo nopuution	Baggage Handling	Baggage Handling
F2 Comfort	Flight Information	Cleanliness
X19 Legroom	Safety & Reliability	Check In
X20 Seat Width	Punctuality	Employee Courtesy
X21 Seat Comfort	5	1 5 5
X22 Personal Space	Convenience	Service Addition
-	Online Search	Complimentary Drinks
F3 Onboarding	Website	Complimentary Pillows
X12 Check-In	Frequent Flier Program	Prior Service
X13 Bag Policy	Reservations	Amenity
X14 Boarding		
X15 Bag Stowage	In-Flight Services	Customer Loyalty
X16 Seat Assign	Meals	Frequent Flier Program
	Seat Comfort	Codesharing
F4 Service	In-Flight Entertainment	
X24 Cabin Crew	Cabin Cleanliness	Uninterrupted Service
X25 Courtesy & Resp	Image & Reputation	Connecting Flight
X27 Service	Travel Services	Nonstop Flights
		Flight Schedule
F5 Flight Schedule	Travel Availability	
X9 Frequency	Direct/Connecting Flight	
X10 Dep & Arr Times	Flight Schedule	
X11 Nonstop Flts		

X8 Airfare. One of the key passenger choice attributes was anticipated to be X8 Airfare. Both studies also considered Airfare in their factor structure, although Chen and Chao's (2015) Price construct included Promotional Strategies whereas Min and Min's (2015) Service Recovery construct considered Airfare along with Alternative Flight and Reasonable Follow-Up. To ensure that X8 Airfare remained distinct, it was not part of the factor structure, so that its contribution was not diminished or obscured by other variables.

F1 Operations. The F1 Operations construct consisted of five variables: X29 Reliability, X30 Punctuality, X31 Safety, X32 Image, and X33 Reputation. Since X30 Punctuality and the on-time performance of an airline is an element of X29 Reliability, there was an interrelationship seen with an error term covariance. X32 Image and X33 Reputation also had an interrelationship (error term covariance) as those variables tended to go hand-in-hand, which was consistent with feedback during survey development. An airline with a stellar safety record could enhance that airline's image and reputation, with the reverse also holding true—as an accident could tarnish both. Flying as a modern-day airline passenger is incredibly safe, and furthermore many of the trans-Atlantic LCLH carriers are operating shiny new aircraft that came straight from the Airbus and Boeing factories and are equipped with the latest and greatest technology. However, given the exceedingly rare nature of accidents, passengers might form judgments about the perceptions of safety of an airline by its punctuality, reliability, reputation, and image. Thus X31 Safety is the final piece of the F1 Operations construct. This factor structure held together throughout EFA and CFA, and it also had practical significance, since the variables fit well together.

While Chen and Chao (2015) included the same set of variables that the dissertation contained for the F1 Operations construct, they were split between the Ground Services (Safety, Reliability, and Punctuality) and In-Flight Services (Image and Reputation) constructs. However, a flaw in Chen and Chao's (2015) factor structure is they create the perception that those variables pertain to just ground or flight—whereas they are all encompassing. Min and Min (2015) only considered two of those variables: Safety and Punctuality, and grouped them together under their Service Assurance construct.

F2 Comfort. The F2 Comfort construct consisted of four variables: X19 Legroom, X20 Seat Width, X21 Seat Comfort, and X22 Personal Space. Perceptions of X19 Legroom could be influenced by such reasons as how tightly the rows of seats were pitched, thickness of seatbacks, whether a passenger seated in front reclined, how tall the passenger was, and also variations in the amount of legroom—dependent upon the particular seat the passenger had on the aircraft. X20 Seat Width for LCCs has typically been fixed without the ability to fit in an extra seat across, since they have traditionally operated narrow-body jets. However, with wide-body jets airlines often have the choice of whether they want to squeeze in an extra seat per row, which has been done by LCLH and FSCs alike. X21 Seat Comfort is focused on the seat itself rather than its dimensions, and perceptions could be dependent both upon personal preferences and the particular seats that the plane has been outfitted with. X22 Personal Space could be influenced by whether a person seated in front reclined into their space, whether passengers were seated adjacent to them, and the aircraft type. X22 Personal Space can be related back to F2 Comfort by considering how a passenger would feel on a long-haul flight with an empty row of seats to stretch out in, rather than the alternative. The variables for F2 Comfort definitely fit together, although perceptions of comfort could vary depending upon the passenger. While the dissertation has a dedicated F2 Comfort construct signifying its increased emphasis on long-haul flights, Chen and Chao (2015) only included a Seat Comfort variable which was placed under the In-Flight Services construct, whereas Min and Min (2015) did not consider comfort whatsoever.

F3 Onboarding. The F3 Onboarding construct consisted of five variables: X12 Check In, X13 Baggage Policy, X14 Boarding, X15 Baggage Stowage, and X16 Seat Assignment. This was a set of variables grouped together from the interactions beginning when passengers arrived at the airport until they were seated on the jet, ready for departure. Going in sequential order, X12 Check In was the first interaction with the airline, whether that was completed online or in-person. Next was X13 Baggage Policy, which ran the gammut of complimentary checked and carry-on baggage on an FSC to, perhaps, surprise fees on an LCLH carrier which escalate the closer a passenger gets to departure time. For X14 Boarding, when CFA was performed, it had an error covariance with e30 Punctuality, indicating its relationship to timely boarding of a flight for passengers. For X15 Baggage Stowage satisfaction, that might depend upon how full the aircraft is, whether the overhead bin space is gratis—or in the case of LCLH carriers, if it requires a fee to access—and also the size of the aircraft's stowbins. Regarding X16 Seat Assignment satisfaction, it could be affected by whether the passenger got their preferred seat (i.e. window vs. aisle), whether they got to be seated next to any travel companions, whether they could select their seat in advance, and if there was an associated fee. While X17 Cabin Design was placed under the F3 Onboarding construct for CFA, it was eliminated since it had a cross-loading issue with F2 Comfort. While the overall EFA showed that X18 Cleanliness could have fit under F3 Onboarding, based upon the results of LCLH and FSC EFA it was excluded, as it had cross-loading issues with multiple other constructs. Cleanliness was included in the In-Flight Services (Chen & Chao, 2015) and Service Assurance (Min & Min, 2015) constructs. F3 Onboarding was among the weaker constructs, as the relationship between the variables was more sequential rather than holding practical significance. While the dissertation had the F3 Onboarding construct, Chen and Chao (2015) did not consider any of those variables in their factor structure, whereas Min and Min (2015) only included Check In and placed it under the Service Assurance construct.

F4 Service. The F4 Service construct consisted of three variables: X24 Cabin Crew, X25 Courtesy and Responsiveness, and X27 Customer Service. X24 Cabin Crew was at the core of the service construct, since the majority of a passenger's long-haul experience is within the confines of an aircraft. X25 Courtesy and Responsiveness was intended to capture the overall impressions of airline staff. While X23 Pilots would have best fit this construct, the results of EFA led to omitting it from the factor structure. On long-haul flights, the pilots are typically low key to let the passengers rest, so their limited interactions with passengers might consist of pre-departure and pre-arrival announcements and greeting passengers as they deplane, unless a non-routine situation arises. F4 Service was a more unusual construct, since variables were a mix of those focused on particular employees (X24 Cabin Crew), behaviors (X25 Courtesy & Responsiveness), and overall impressions of how passengers felt the airline treated them (X27 Customer Service)—all of which were approaches taken in the existing literature.

While the dissertation had the F4 Service construct, Chen and Chao (2015) lumped their service-related variables under Ground Services. On the other hand, Min and Min (2015) structured Service differently with related variables placed under the Service Recovery, Service Assurance, and Service Addition constructs.

F5 Flight Schedule. The F5 Flight Schedule construct consisted of three variables: X9 Frequency, Departure and Arrival Times, and X11 Nonstop Flights. The F5 Flight Schedule construct captured the essence of how a passenger would evaluate decisions regarding flight schedule. This construct was comparable to those of Travel Availability (Chen & Chao, 2015) and Uninterrupted Service (Min & Min, 2015).

Discussion of RQ 2 – Passenger Choice of LCLH or FSC

How do passengers prioritize impact variables/factors when selecting their trans-Atlantic LCLH or FSC, and which impact variables/factors, demographics, and trip characteristics influenced choice of carrier?

Logistic regression was performed with demographics, trip, and traveler characteristics with the first model utilizing factors and the second model using the individual Likert scale variables. In order to show the relative importance of the variables/factors that affected passenger choice of LCLH or FSC, Table 30 places them in rank order on the basis of the absolute value of the odds ratio from the logistic regression models, where the variable/factor with the highest odds ratio has the greatest impact on passenger choice of carrier type. X8 Airfare prevailed as the most important predictor of choice of carrier type, followed by F2 Comfort, F4 Service, and F5 Flight Schedule. Satisfaction with X8 Airfare and F2 Comfort were associated with choice of an LCLH carrier, whereas satisfaction with F4 Service and F5 Flight Schedule were associated with choice of an FSC. In the discussion that follows, the results will be organized by factor, with the variables that comprise each factor discussed in turn.

Table 30

Relative Importance of Variables and Factors

Variable/Factor	Choice of LCLH	Choice of FSC	No Impact
Gender			Х
Age	Younger	Older	
Education	Less Educated	More Educated	
Income			Х
Class of Service	Economy	Premium Economy	
Travel Frequency			Х
Trip Purpose			Х
X8 Airfare	#1 Impact		
F1 Operations			Х
F2 Comfort	#2 Impact		
F3 Onboarding			Х
F4 Service		#3 Impact	
F5 Flight Schedule		#4 Impact	
X8 Airfare	#1 Impact	<u>^</u>	
X9 Frequency	Î	#7 Impact	
X10 Dep & Arr Times		<u>^</u>	Х
X11 Nonstop Flights	#10 Impact		
X12 Check-In	#2 Impact		
X13 Baggage Policy	Î	#4 Impact	
X14 Boarding		<u>^</u>	Х
X15 Baggage Stowage	#12 Impact		
X16 Seat Assignment	#9 Impact		
X17 Cabin Design			Х
X18 Cleanliness	#8 Impact		
X19 Legroom	#3 Impact		
X20 Seat Width			Х
X21 Seat Comfort		#13 Impact	
X22 Personal Space			Х
X23 Pilots			Х
X24 Cabin Crew		#5 Impact	
X25 Courtesy & Resp			Х
X27 Customer Service			Х
X29 Reliability			Х
X30 Punctuality			Х
X31 Safety			Х
X32 Image			Х
X33 Reputation		#11 Impact	
X34 Flight Booking			Х
X37 Food & Beverage		#6 Impact	
X39 Baggage Handling			Х

Demographics, trip, and traveler characteristics. Gender was not a predictor of passenger choice of carrier, which was consistent with the findings in the existing literature (Castillo-Manzano & Marchena-Gómez, 2011; Ong & Tan, 2010).

Age was deemed important in passenger choice of carrier in the trans-Atlantic market, with younger passengers preferring LCLH and older passengers FSCs; and this is a key finding, since this is the *first known study* performed in a long-haul market. This was consistent with the findings of O'Connell and Williams (2005) in the short-haul European market. While age did not play a role in passenger choice of LCC or FSC for other studies, they were only conducted within short-haul markets (Castillo-Manzano & Marchena-Gómez, 2011; Thanasupsin et al., 2010).

Education affected passenger choice of LCLH or FSC, with less educated passengers preferring an LCLH carrier and more educated passengers preferring an FSC. It should be noted that college students who had not completed their degrees were classified in the lowest education category (high school education). Therefore, the less educated also included the younger college students who might not yet be in the workforce and thus could have limited financial resources. Research performed by Ong and Tan (2010) in the Malaysian market also determined that passengers with more education preferred flying FSCs; however, Castillo-Manzano and Marchena-Gómez (2011) saw no impact on the basis of education.

Income level did not show up as a predictor of passenger choice of carrier, which was consistent with the findings of Ong and Tan (2010). However, Thanasupsin et al. (2010) found that Thai passengers with lower income gravitated to LCCs, whereas those with higher income were more likely to choose an FSC. The household income profiles

of LCLH and FSC passengers were fairly consistent, although the FSC passengers had slightly higher incomes. The majority of passengers surveyed for the dissertation were traveling for leisure purposes, primarily visiting friends and relatives or vacation, thus it is assumed they had a certain level of affluence and disposable income in order to afford a trans-Atlantic trip.

Class of service also affected passenger choice of carrier, with those flying economy preferring an LCLH carrier and those flying premium economy preferring an FSC. Travel frequency and trip purpose did not affect passenger choice of LCLH or FSC. Since the sampling frame was limited to those flying economy or premium economy, the vast majority of those surveyed were infrequent fliers traveling for leisure purposes.

The findings of demographic variables and whether they play a role in passenger choice of LCC or FSC often lack consistency from one passenger survey to the next. In particular, studies are often very localized to passengers of one nationality or geographic region. The core difference is that the existing literature reviewed consists of studies performed in short-haul markets, whereas the dissertation research was carried out in a long-haul market. It is expected that the finding of younger passengers preferring LCLH and older passengers preferring FSC will be generalizable to other long-haul markets.

X8 Airfare. When considering all of the factors and Likert scale variables, X8 Airfare was the number one predictor of passenger choice of an LCLH carrier in the trans-Atlantic market. This was a key finding, since Airfare even prevailed over Comfort and Service for long-haul travel. This substantiated the claim of Wensveen (2011), who noted that since long-haul travel is often more expensive, airfare could be of greater importance to passengers. The significance of X8 Airfare is consistent with the existing scholarly research on LCCs in short-haul markets (Kurtulmuşoğlu et al., 2016; Mikulić & Prebežac, 2011; O'Connell & Williams, 2005; Ong & Tan, 2010; Thanasupsin et al., 2010). Yeung et al. (2012) had respondents rate importance of attributes and found that airfare was equally important for LCSH and prospective LCLH travelers. Jiang's (2013) research on Asia-Pacific LCLH carriers AirAsia X and Jetstar also found that airfare was one of the most important attributes for passengers.

F1 Operations. The F1 Operations construct was not a predictor of passenger choice of LCLH or FSC in the trans-Atlantic market. When logistic regression was rerun with variables, those that comprised the F1 Operations construct (X29 Reliability, X30 Punctuality, X31 Safety, X32 Image, and X33 Reputation) were all considered individually. X33 Reputation was the only variable affecting passenger choice, and it was associated with flying an FSC. Chen et al. (2008) found that Taiwanese students taking long-haul flights were cognizant of the reputation of their chosen airline; an awareness formed on the basis of their air travel experience, along with the experiences shared by others or what they had read about the airline. Iconic airlines such as American or British Airways are well known, and their reputations have been built over time, and they traditionally have offered an all-inclusive long-haul product with service, food and beverage, and amenities that could be appealing to passengers. With a spate of LCLH carriers entering the trans-Atlantic market, they tend to be unknowns— particularly if they are unaffiliated, as passengers may not have flown them before or

heard of experiences from others. While Norwegian Air is well known throughout Europe since it is one of the largest LCCs, it is a newer entrant to the U.S. market and is less established. As mentioned previously, LCLH carrier Norwegian Air has been unfairly portrayed as a villain in the media with falsehoods spread, claiming that it is attempting to undercut union airline jobs and put the U.S. industry at risk.

X32 Image did not show up as a predictor for choice of carrier in the trans-Atlantic market, nor was it found to be of much relevance in the existing literature (Alamdari, 1999; Lu & Tsai, 2004; Park, 2007; Yeung et al., 2012). Also, X29 Reliability and X30 Punctuality did not play a role in passenger choice of carrier type however, if this survey would have been conducted several years ago during Norwegian Air's B787 entry-into-service, when it was plagued with operational difficulties (mostly due to Thor who has since been rehabilitated), they could have been key differentiators. While Norwegian's dispatch reliability and punctuality suffered during B787 entry-intoservice, as previously noted, all new aircraft tend to have teething pains, and that is one of the perils of being amongst the first operators of a new aircraft type. Reliability and punctuality are attributes that are very specific to particular airlines and markets, thus these findings are not expected to be generalizable to other long-haul markets.

X31 Safety was not found to play a role in passenger choice of carrier in the trans-Atlantic market. The research of Yeung et al. (2012) in the Hong Kong market showed that safety was the number one most important attribute for prospective LCLH passengers; however, that was also influenced by a spate of accidents involving LCCs in Asia. That finding was supported by Jiang (2013) who surveyed LCLH passengers from AirAsia X and Jetstar, and who also deemed that safety was highest in importance. Ringle et al. (2011) found that operating new aircraft—such as LCLH carriers Norwegian and WOW air—could instill confidence in the passengers and serve as an indicator to passengers that airlines are investing in their fleet, thus perceptions of safety are enhanced. Furthermore, LCLH carriers in the trans-Atlantic market have unblemished safety records, and in North America and Europe commercial aviation is safer than in other geographic regions (Allianz, 2014). O'Connell and Williams (2005) also found that safety did not affect passenger choice of LCC or FSC in short-haul European markets.

F2 Comfort. F2 Comfort was the number two priority for long-haul trans-Atlantic passengers. Comfort being important to long-haul passengers was consistent with the existing scholarly research that had been performed in Asia (Chen et al., 2008; Lu & Tsai, 2004) and Europe (Mintel, as cited in Hugon-Duprat & O'Connell, 2015; Vink et al., 2012), suggesting that this finding holds generalizability. Furthermore, this finding was substantiated by Boeing passenger survey research done in support of the B787, which found that comfort was important to long-haul passengers (Emery, 2010).

It was also discovered that F2 Comfort was positively related to passenger choice of an LCLH carrier. While comfort is typically associated with FSCs, one possible explanation for this unconventional finding is fleet type. Vink et al. (2012) noted that new wide-body jets with modern interiors, which describe the fleet types that LCLH carriers utilized predominately on the routes passengers were surveyed from, could have led to passenger perceptions of greater comfort.

Norwegian Air is flying its brand-new B787-9 Dreamliners on trans-Atlantic flights from both SEA and LAX to London–Gatwick. The B787 Dreamliner was

designed with passenger comfort in mind and features lower cabin altitude, higher humidity, oversized windows (30% larger), quieter interiors (60% less noise), mood lighting, and a gust suppression system to smooth out the ride (CNN, 2011; Emery, 2010). Regarding WOW air, all but one of their A330s was recently delivered from the Airbus factory. In contrast, at the time that this survey was conducted, although American and British Airways had B787s in their fleet, they were operating older fleet types out of SEA and LAX on their trans-Atlantic flights, on which the majority of passengers surveyed flew. The average age of the core fleet types that FSC passengers might have flown on included an American B777 (13 years), British Airways A380 (4 years), British Airways B747 (21 years), or British Airways B777 (15 years) (Planespotters, 2018). While Virgin Atlantic flies Dream Girl, Miss Chief, Queen Bee, Leading Lady, and its other B787-9s (average age of two years) out of SEA and LAX, its passengers only comprised 13% of the FSC sample. Since FSCs often focus their attention and dollars on continually updating and refreshing their premium cabins, economy cabins tend to be more of an afterthought, thus depending upon the airline, older airplanes might have more tired and worn interiors.

As LCLH carriers—including Norwegian, Primera Air, and WOW air—expand usage of narrow-body aircraft, it may diminish perceptions of personal space (lower ceilings, more confined space with a single-aisle jet) although, to some extent, it could be offset by these airlines deploying new derivative aircraft, which might provide a better passenger experience.

When logistic regression was rerun with variables, those that comprised the F2 Comfort construct (X19 Legroom, X20 Seat Width, X21 Seat Comfort, X22 Personal Space) were considered individually. The two variables which proved to be important to passenger choice of carrier were X19 Legroom and X21 Seat Comfort, which is substantiated by the research of Vink et al. (2012) who noted those as the two most influential aspects affecting passenger comfort. X19 Legroom was *positively* associated and X21 Seat Comfort was *negatively* associated with choice of an LCLH carrier. Norwegian Air and WOW air both feature slimline seats, thus for a given seat pitch—since the seatback is thinner—passengers have more legroom. Norwegian attributes the two extra inches of legroom on its B787s to the use of slimline seats (Sumers, 2016b). Furthermore, with WOW air, all economy class seats are not created equal: while its standard seats offer a 29 to 31-inch pitch, the airline also has XL (32 to 33-inch pitch) and XXL (35-inch pitch) seats. The tradeoff with slimline seats is they are often notorious for being quite uncomfortable for passengers, as they tend to lack the cushioning and support of the prior era of seats, thus legroom and seat comfort tend to be diametrically opposed.

X20 Seat Width did not play a role in what affected a passenger's choice of carrier type. While WOW air offered 17-inch seat width on its A330 and Norwegian Air 17.2-inch seat width on its B787-9, the British Airways A380 and the Virgin Atlantic B787-9 had 17.5-inch width. American B777s had 16.2 to 18.5-inch seat width, depending upon whether the aircraft was configured with 9 or 10 seats across (SeatGuru, 2018). Vink et al. (2012) also noted that the amount of space that the armrests take up could alter passenger perception of seat width, thus the particular seats an airline has outfitted its planes with could affect this. X22 Personal Space did not influence passenger choice of carrier type, as perceptions were likely to be dependent upon considerations such as whether or not passengers had empty seat(s) adjacent to them or how high the load factor was.

F3 Onboarding. F3 Onboarding was not a predictor for passenger choice of carrier type, which is understandable since this was a catch-all category. When logistic regression was rerun with variables, those that comprised the F3 Onboarding construct (X12 Check In, X13 Baggage Policy, X14 Boarding, X15 Baggage Stowage, X16 Seat Assignment) were all considered individually. While X12 Check In was positively associated with choice of an LCLH carrier, the rationale for this was not known—perhaps it was the length of the queue, online check-in procedure, in-person process, or other considerations. Yeung et al. (2012) noted that respondents considered check in to be more important if flying an LCLH rather than an LCSH carrier.

X13 Checked and Carry-On Baggage Policies and Fees had a negative relationship with choice of an LCLH carrier. This can be explained by reviewing the baggage policies that airlines have. FSCs American Airlines, British Airways, and Virgin Atlantic traditionally have offered their economy class travelers as complimentary one checked bag, one carry-on bag, and one personal item. Norwegian Air charges a flat fee per checked bag, and the ticket purchased determines the allowable weight of carryon baggage. WOW air charges for both checked and carry-on baggage, and the fees get progressively higher the longer a passenger waits to pay them, which could result in sticker shock at the gate. While LCLH carriers benefit from the ancillary revenue generated by checked and carry-on baggage, their policies also encourage passengers to travel lighter which, in turn, reduces aircraft fuel burn and operating costs. While Chang and Sun (2012) found that an LCC that charged for baggage could lead to a reduction in the tickets purchased, checked and carry-on baggage fees are the norm for LCLH carriers. Furthermore, a recent development in the trans-Atlantic market, which has transpired since this survey was conducted, has been the introduction of FSC handbaggage-only (HBO) fares, currently being pitched as part of a basic economy product. It is too early to tell if competitive pressures lead FSCs to establish compulsory checked baggage fees for all FSC economy passengers, or if restrictions and fees are placed on hand baggage, which has already been done by FSCs in the U.S. domestic market.

X14 Boarding did not play a role in passenger choice. While FSCs often had a greater number of passengers to board, such as with British Airways operating the gargantuan A380, their enplaning process was witnessed to be very organized and efficient—queuing and strategies for efficient boarding have been extensively analyzed in the scholarly literature, thus airlines have it down to an exact science, although their processes may differ. The implementation of HBO fares by FSCs, could very well impede the boarding process due to increased carry-on baggage by passengers wanting to avoid checked baggage fees. The IATA Global Passenger Survey (2017) determined that 37% of respondents cited excess carry-on baggage as one of their top three concerns with aircraft boarding.

X15 Baggage Stowage Space was positively associated with choice of an LCLH carrier. Norwegian Air has a carry-on baggage allowance, and WOW air charges for carry-on baggage over a certain amount, resulting in freed overhead bin space. Boeing and Airbus have both redesigned the overhead baggage stowage bins, so that aircraft are capable of holding a greater volume of baggage. Overhead space is often at a premium in

the era of checked baggage fees and jam-packed flights with a high load factor. The B787s operated by Norwegian Air have Space Bins capable of holding 30% more baggage than the older B777 aircraft (CNN, 2011). With FSCs introducing HBO fares, this is likely going to lead to their passengers carrying on more baggage than ever before, which could be problematic for older aircraft with cramped stowbins. While X16 Seat Assignment and Fees was positively associated with LCLH carriers, the reason for this has not yet been determined. FSCs have traditionally offered an advance seat assignment as complimentary. While an LCLH passenger might be charged for a seat assignment, Norwegian Air features a more upscale economy experience relative to most LCCs, and a perk of WOW air is that passengers can choose seats with additional legroom for a fee.

F4 Service. F4 Service ended up being the number three priority of passengers, and it was positively associated with choice of an FSC in the trans-Atlantic market. This research was consistent with the findings of Thanasupsin et al. (2010) who noted that Thai passengers who valued service were more likely to opt for an FSC. While service has traditionally been deemed relatively unimportant in the scholarly literature (Alamdari, 1999; Kurtulmuşoğlu et al., 2016; Lu & Tsai, 2004; Mason, 2001; O'Connell & Williams, 2005; Yeung et al., 2012), the findings from this research support its being a differentiator for long-haul passengers.

When logistic regression was rerun with variables, those that comprised the F4 Service construct (X24 Cabin Crew, X25 Courtesy & Responsiveness, X27 Customer Service) were all considered individually. X24 Cabin Crew was positively associated with choice of an FSC. Cabin crew on FSCs have more services and amenities to offer their passengers, making for a more pleasant crossing of the North Atlantic, and the most time a passenger spends with an airline is while aboard the airplane. Although Kurtulmuşoğlu et al. (2016) deemed X24 Cabin Crew, X25 Courtesy and Responsiveness, and X27 Customer Service relatively unimportant, it should be noted that their research was carried out in the Turkish domestic market, and not in a long-haul market.

F5 Flight schedule. F5 Flight Schedule was positively associated with choice of an FSC, and this was the number four priority for passengers. This finding was supported by the research of Proussaloglou and Koppelman (1995), who determined that carrier market presence and schedule convenience are often associated with FSCs. However, Ong and Tan (2010) determined that passengers favoring flight schedule would select LCC AirAsia rather than FSC Malaysia Airlines. Thus flight schedule is highly dependent upon the particular market and airlines, so findings pertaining to passenger choice are not expected to be generalizable. When logistic regression was rerun with variables, those that comprised the F5 Flight Schedule construct (X9 Frequency, X10 Departure & Arrival Times, X11 Nonstop Flights) were all considered individually. The results will be discussed at the variable (rather than construct) level for clarity and further elaboration on the trans-Atlantic market.

X9 Frequency was positively associated with choice of an FSC. At the time the survey was conducted, FSCs American and British Airways each offered twice daily service between LAX and London. Since American and British Airways are both Oneworld alliance members and codeshare, passengers who had booked through either British Airways or American would have had four daily flights available to them. In comparison, at the time this survey was conducted, Norwegian Air only offered daily service between LAX and London. Also at the time of this survey, on the SEA to London route, FSCs British Airways and Virgin Atlantic had higher frequency service than Norwegian Air, which only served that route four times per week, while WOW air operated daily service between LAX and Keflavík. As LCLH carriers expand, their frequency of service often grows, if demand is sufficient to warrant it. For example, Norwegian will be ramping up its service between the U.S. and London by adding 150,000 seats during summer of 2018, boosting the frequency of service on existing routes, including increasing its LAX to London–Gatwick service from seven to eleven weekly flights (Davies, 2018). LCLH carriers also serve thinner routes with insufficient demand for service on a more frequent basis than weekly.

X10 Departure and Arrival Times did not affect passenger choice of carrier. LCLH carriers tend to have departure and arrival times at inopportune times for several reasons—difficulty getting choice airport slots, wanting to achieve higher aircraft utilization, and lack of need to coordinate the timing of flights for connecting passengers. However, the reality is that flying a long-haul, trans-Atlantic flight and crossing multiple time zones is always rather inconvenient in comparison to short-haul flights where both departure and arrival times can be optimized for passenger convenience. Proussaloglou and Koppelman (1995) did note the importance of departure times for business travelers. As Norwegian has begun increasing its frequency of service on key routes, this is leading to greater choice for passengers in respect to departure and arrival times. X11 Nonstop Flights was positively associated with choice of LCLH carrier. This was supported by Yeung et al. (2012), who found that nonstop flights were the most important aspect of flight schedule for prospective LCLH passengers. Suzuki (2004) also determined that passengers favored nonstop flights. While direct flights have typically been associated with a higher cost than nonstop flights, LCLH carriers are swooping in to offer direct service at a lower fare. A cornerstone of the strategy of LCLH carriers in the trans-Atlantic market has been the establishment of uncontested nonstop routes. For WOW air, passenger perceptions of nonstop flight availability were dependent upon the travelers' origin/destination being Iceland or the continuation on to mainland Europe. Several passengers had noted they had chosen WOW air for their nonstop service, making it more convenient than an indirect routing on an FSC, thus schedule was the core reason for their choice rather than airfare. A point-to-point route structure is not a strategy that FSCs could easily emulate, since their operations are configured for a hub-and-spoke network.

The trans-Atlantic market is dynamic and ever changing, thus the findings from this dissertation concerning schedule are merely a snapshot at one point in time. Whether an LCLH or an FSC is strongest on flight schedule is market dependent and also hinges upon the service levels of the respective carriers—broad, sweeping generalizations cannot be made. While in high volume markets the FSCs may prevail, LCLH carriers could have the edge in markets where they are the sole provider of nonstop flights on a given route, stimulating demand and also acquiring travelers who would have taken an indirect routing on an FSC. While a weakness of LCLH carriers is that they do not have feeder traffic on U.S. ends of their routes; they have counteracted this hindrance by utilizing narrow-body aircraft and offering lower frequency service on thin routes. However, as they expand and grow their operations, feeder traffic could become more important. What was not considered was the lack of connectivity that LCLH carriers have, particularly on the U.S. ends of their routes—as that could greatly impact convenience. That could also put independent LCLH carriers at a disadvantage, relative to LCLH AWAs such as Joon and LEVEL that have feeder traffic on both ends of their routes, due to their parent FSCs along with alliances and partnerships.

Other variables. Finally, the variables not part of the factor structure will be discussed in turn. X17 Cabin Design was rather arbitrary since it referred to a general perception about an aircraft's interior. X18 Cleanliness was positively associated with passenger choice of LCLH carrier, a finding that was expected, since brand-new aircraft straight from the factory tend to be cleaner, although it also depends upon the level of carrier. LCLH AWAs like LEVEL and Joon are plucking seasoned pilots with long-haul wide-body jet experience from their FSC operations to pilot their aircraft, and independent LCLH carriers are recruiting experienced pilots to serve as their captains. The interactions that pilots have with passengers were expected to be no different based upon whether they flew for an LCLH or an FSC. X34 Flight Booking was not associated with passenger choice of LCLH carrier either—these days with the prevelance of Internet and web-based booking, the playing field amongst carriers is level, thus no differences were anticipated.

X37 Food and Beverage was negatively associated with passenger choice of an LCLH carrier and positively associated with choice of an FSC. This was an expected finding because passengers flying an LCLH carrier had to pay for food and beverage, and even a cup of water was associated with a fee. Whereas, at the time this survey was conducted, FSCs in general provided complimentary food and beverage for long-haul flights. Food and beverage being positively associated with FSCs rather than LCCs was found to be the case by Fourie and Lubbe (2006) along with Thanasupsin et al. (2010). While the existing literature suggested that food and beverage was of low importance to passengers (Fourie & Lubbe, 2006; Kurtulmuşoğlu et al., 2016; Min & Min, 2015), this research has demonstrated that food and beverage does indeed matter for long-haul travelers and is a differentiator between the offerings of LCLH and FSCs.

X39 Baggage Handling did not play a role in passenger choice of LCLH carrier. For long-haul, international travel, passengers typically have to clear customs—which could entail a lengthy wait, thus the speed at which their baggage arrives on the carousel is of less relevance. Furthermore, baggage handling is not typically a memorable experience unless an atypical service failure occurs resulting in a passenger's baggage being damaged, delayed, misrouted, or forever lost.

Discussion of RQ 3 – LCLH Passenger Switching Behavior

Were LCLH passengers willing to switch to an FSC for a trans-Atlantic flight? If so, how much more in airfare were they willing to pay, and which impact variables/factors and demographics were determinants?

Willingness to switch from LCLH to FSC. The results will be discussed for willingness to switch from an LCLH to an FSC. Since decision tree analysis has been utilized, the researcher has intentionally commingled demographics with airline service attributes for this discussion. Regarding LCLH passengers who were surveyed, 55% would remain loyal, whereas 45% were willing to switch to an FSC. The predictors for willingness to switch were X8 Airfare, Income, Education, Age, Gender, F2 Comfort, and F1 Operations. Respondents who were Very Dissatisfied/Dissatisfied with X8 Airfare for their respective LCLH carrier were least willing to switch (28%) to an FSC. Passengers dissatisfied with what they paid in LCLH airfare likely presumed that if they switched to an FSC it would be even more expensive. While FSCs are introducing HBO/basic economy fares, it is not known how competitive on price they will be. The threshold for Household Income affecting willingness to switch decisions was at the \$25,000 mark, with respondents earning less tending to be more inclined to stay with an LCLH carrier (65%). Thus passengers who had limited financial means also tended to be more price-sensitive.

F2 Comfort was important to retention of LCLH passengers, as 49% of respondents who were Very Dissatisfied/Dissatisfied/Neutral versus 35% of those who were Satisfied/Very Satisfied were willing to switch to an FSC. However, for age 55 and

above passengers, F2 Comfort was a chief concern for those who were Neutral/Satisfied with X8 Airfare and earned \$25,000 or more. If the age 55 and above passengers were Satisfied/Very Satisfied with F2 Comfort of their chosen LCLH carrier, only 28% would switch. However, 74% of those passengers Very Dissatisfied/Dissatisfied/Neutral with F2 Comfort would be willing to switch to an FSC. This was consistent with the findings of Balcombe et al. (2009) that older passengers were willing to pay more for comfort. For those who were age 55 and above and were not satisfied with F2 Comfort, an overwhelming 94% who were Very Dissatisfied/Dissatisfied/Neutral with F1 Operations (which is comprised of Reliability, Punctuality, Safety, Image, Reputation) would switch to an FSC.

Regarding passengers who were Very Satisfied with X8 Airfare, those with a High School/Bachelor's or less education were more willing to switch (42%) than those who held advanced degrees such as an MS or a Ph.D. (22%). While the rationale for this difference is unknown, perhaps since graduate school teaches critical thinking skills, the better-educated passengers had more carefully researched their air travel options prior to purchasing their tickets or, since they got a good fare, they were less inclined to switch. Females holding advanced degrees and feeling Very Satisfied with X8 Airfare were less likely to switch to an FSC (12%) and tended to be more loyal than the Males (37%).

Willingness to pay to switch from LCLH to FSC. For amount willing to pay more to switch from LCLH to FSC, Table 31 shows the results of the logistic regression model. Only demographics and trip attributes were included in the model, although airline service attributes were also considered.

Table 31

	Increase in Airfare	Increase in Airfare
	Switch to FSC	Switch to FSC
Variable	\$1 to \$130	\$131 to \$2,334
Age	Younger	Older
Education	More Educated	Less Educated
Class	Economy	Premium Economy
LCLH Airline	Norwegian	WOW air

Willingness to Pay More to Switch from LCLH to FSC

Older LCLH passengers were willing to pay a higher amount in airfare to switch to an FSC, whereas younger passengers were willing to pay less. Thus not only do older travelers prefer FSCs, but this is evidence they also have a greater willingness to pay to switch to an FSC. However, passengers with less education tended to be willing to pay a higher amount in airfare to switch to an FSC, whereas more educated passengers were willing to pay less. Passengers who had flown premium economy said they would pay more to switch to an FSC than passengers who had flown economy. WOW air passengers would pay a higher amount in airfare to switch to an FSC relative to Norwegian Air passengers; however, this result ended up not being statistically significant in the regression model. Since Norwegian Air offers a more upscale experience than WOW air—its offering positioned closer on the spectrum to an FSC— perhaps that was why passengers were less inclined to pay more to switch.

Passenger insights – why remain loyal to LCLH. As expected, the chief reasons why passengers would stay loyal to LCLH carriers were fiscally related. Some LCLH passengers noted they were students or otherwise on limited budgets. Also, some

passengers stated they wanted to spend the bulk of their money on their actual vacation rather than transportation. Several passengers said that if trans-Atlantic fares were lower, they would travel by air more frequently, which fits with the notion of lower fares stimulating demand. Some LCLH passengers expressed their preference for an unbundled/a la carte offering, paying only for the amenities and services they would use, whereas others liked having the option of bundled items.

Passengers who had realistic expectations for an LCLH experience and who adequately prepared themselves—such as by bringing along food and beverage, a pillow/blanket, entertainment, packing light to avoid baggage fees, were cognizant of the fee structure, and were prepared to pay for the items they needed—tended to be more content. Passengers who slept during long-haul flights stated they had no need for services and amenities. Passengers also liked WOW air's direct flights between LAX and Keflavík, since flying an FSC would have required an indirect routing. LCLH passengers also noted their satisfaction with their chosen airline and the level of service provided, even to the extent that several of them considered their LCLH flight superior to their past experiences on an FSC. The Norwegian B787 Dreamliners received accolades, and passengers specifically said they liked flying this type of aircraft. Passenger comments are listed below.

- → "I was very satisfied with the service I received. I am quite frugal with my
 money!"
- → "I purchase tickets at the best value. My Norwegian flight was much less expensive than any other airline. The perks won't sway me; the price will."

- → "I chose to fly a budget airline so that I would pay a low fare and could pay a la carte for the additional services I needed (which were not many)."
- → "I love the airline I fly with [Norwegian]."
- → "The only reason we were even traveling across the Atlantic was because of how inexpensive WOW Air was."
- → "Importance is the destination rather than the journey. If I can save on the flight I can spend more on holiday or take another with the money saved."
- → "Prices were cheaper. Being a student who does not make a lot of money and loves to travel, I go with the cheapest option to get me where I want to go."
- \Rightarrow "The flight was better than many full-service airlines I've flown."
- → "As a premium economy customer all meals, checked baggage are included as well as snacks, drinks, pillows and blankets. Norwegian Air as a standard in economy has an excellent array of free in-flight entertainment, which I have found is better than some other airlines."
- → "I like having the options around baggage, food, drinks, etc. and building my own
 personalized package of what is required and not required."
- → "Happy to fly with an airline with good customer service and reputation even if they don't offer the additional services."
- → "I chose WOW because it had a direct flight from LAX to KEF. Other airlines (full service) required a dogleg through Seattle or some other intermediate stop, with a layover. Cost was not a significant factor in the decision."
- "The two biggest factors in my selection of flight/airline were cost and travel time. WOW offered the lowest price with a direct flight to Iceland."

- → "If you are careful selecting low cost airlines, then I prefer them. In the case of my two most recent flights, the low cost airline (WOW) was inexpensive enough so that we booked premium economy class seats. And we returned (across Atlantic) on Norwegian for an inexpensive fare on a nice new plane with a surprising amount of legroom. So it worked for us."
- → "WOW's premium economy class offers most of these services at a good price."

Passenger insights – why switch to an FSC. Several key themes emerged from the open-ended responses pertaining to why LCLH passengers would prefer an FSC for future trans-Atlantic travel. Time and time again, passengers emphasized that this was a long-haul, extended duration, nine-to-12-hour flight, and they were less tolerant of a budget experience. Passengers noted that it was a hassle having to pay for the extra services and amenities individually, and they voiced discontent with hidden fees that caught them by surprise, and questioned whether an LCLH carrier really was a lower cost option than flying an FSC when considering the total cost of the trans-Atlantic flight (airfare plus ancillary fees). Passengers longed for the convenience, peace of mind, and extra services and amenities that FSCs offer for long-haul travel. There was a disconnect between the expectations that passengers had for their LCLH experience, versus the reality of what exactly the airline would provide them. However, LCLH carriers Norwegian Air and WOW air do list out what the base airfare or bundled packages include at the time of booking via their website. Inevitably LCLH passengers showed up for their flights astonished that services and amenities they had grown to expect on longhaul flights were not included. Perhaps their booking channel lacked this information,

someone other than the passenger purchased the ticket, or they simply did not pay attention or forgot. The onus is on passengers to educate themselves prior to booking air travel and research what prospective carriers are offering. Depending upon the services and amenities required, they should make the appropriate calculations to determine the actual cost of their air travel in advance, since the initial quoted price is often deceptively low.

Certain aspects of LCLH travel tended to alienate passengers. The lack of free water was a key point of contention and a major irritation—having to pay for a bottle of water resulted in passengers either becoming thirsty and dehydrated, or forking over what they considered an excessive fee. Also, some passengers were expecting their LCLH carrier to provide complimentary food and beverage, and were surprised when it was not included. As a result, they showed up without any food of their own and did not preorder a meal, and inevitably the airline ran out of food. For long-haul travel, baggage is often a requisite item. Even if passengers can pack lighter and avoid the checked baggage fees, they still could be charged for carry-on baggage or be subjected to a restricted hand baggage allowance. Passengers also lamented the lack of complimentary pillows/blankets, as these amenities were deemed more important on a long-haul flight.

Since passengers tended to bring along their electronic gadgets, they also noted the absence of Wi-Fi as a reason for disliking LCLH carriers. While Norwegian Air offers an IFE system, passengers complained about its absence on WOW air flights. LCLH passenger gripes are listed below.

 → "Low food quality/lack of entertainment/lack of Wi-Fi. A larger, full-service airline would also presumably have many flight slots per day in case there was a
problem or delay in the scheduled flight, allowing for the trip to proceed even if later. WOW air only has one flight per day scheduled from most airports. If there was a problem I'm not sure how it would be rectified. Of course in their favor is that most of their equipment is fairly new and in good condition."

- → "The pay for services was too extreme. I understand paying for food or checked baggage, but I should be able to get a cup of water on a nine-hour flight without paying \$3. It feels like extortion, when I don't have another option since security doesn't allow liquids. And I shouldn't have to pay extra to sit next to my family if we're already sitting in coach. There has to be a better balance than this."
- → "We were not told the flight did not include meals, and the sandwiches available for people who did not preorder a meal were sold out almost immediately, if they actually had any at all. So we flew trans-Atlantic with no food, lunch, or dinner. Needless to say we were pretty hungry when we arrived."
- → "I dislike being quoted one price to then have to pay extra when I have to add baggage, seats, etc. . . . I would expect a meal to be included on long haul flights as it is a long time to go without food and drink."
- → "Trans-Atlantic service requires extra services. Too inconvenient to have to supply all extra services yourself, especially for those traveling with children.
 Blankets are a necessity."
- → "On long haul flights there is a health issue for which an airline should have a duty of care to hydrate and feed passengers. With baggage restrictions it's harder to carry things to help you sleep and you spend more in the terminal. I would

rather pay more and know what to expect. There is no 'experience' to low cost flying."

- → "After paying for all the additional services such as baggage allowance, meal and on drinks the flight came to much more than I was originally quoted. A fullservice flight would be easier to book and possibly cheaper in the end."
- → "It was a long flight and they even charged for water. I would have appreciated a snack and water for free, as well as a carry-on."

Discussion of RQ 4 – FSC Passenger Switching Behavior

Were FSC passengers willing to switch to an LCLH carrier for a trans-Atlantic flight? If so, how much less in airfare were they willing to pay, and which impact variables/factors and demographics were determinants?

Willingness to switch from FSC to LCLH. The results of decision tree analysis will be discussed for willingness to switch from FSC to LCLH. Regarding the FSC passengers surveyed, 24% would be willing to switch to an LCLH carrier, whereas 76% would remain loyal to an FSC. This is in contrast to Yeung et al. (2012) who performed research in Hong Kong which found that 77% of respondents would be willing to try an LCLH carrier, whereas 23% would not. However, while the passengers whom Yeung et al. (2012) had surveyed had flown an LCSH carrier before, it is not known how many had experienced long-haul travel, which is of utmost importance.

The predictors for willingness to switch from FSC to LCLH consisted of Gender, F4 Service, X8 Airfare, and F3 Onboarding. Gender most impacted passengers' decision of whether or not to switch from an FSC to an LCLH carrier. Male travelers tended to be impulsive and more inclined to switch on a whim (31%). Whereas Female travelers proved to be more loyal (only 18% would switch) and took into account their satisfaction with F4 Service, X8 Airfare, and F3 Onboarding when making their decision.

F4 Service proved to be the first consideration of female travelers when considering whether to switch to an LCLH carrier. Yeung et al. (2012) found that inflight service was more important for prospective LCLH passengers relative to LCSH passengers, as anticipated, due to flights of longer duration. Yeung et al. (2012) also discovered that LCSH passengers were not willing to try LCLH carriers due to their preference of service over price. If Females were Very Dissatisfied/Dissatisfied/Neutral with both F4 Service and X8 Airfare, then they were most willing to switch to an LCLH carrier (37%). Perhaps they felt that it was not worthwhile paying more to fly an FSC in this instance. In contrast, even if Female respondents were not satisfied with F4 Service, all who were Very Satisfied with X8 Airfare would remain loyal to an FSC. It was a bit perplexing that Females who were Satisfied/Very Satisfied with F3 Onboarding would be willing to switch to an LCLH carrier in greater numbers (50%) versus those who were Very Dissatisfied/Dissatisfied/Neutral (13%). A possible explanation for this conundrum is that passengers who were not satisfied with F3 Onboarding as FSC passengers did not want to further degrade their experience by switching to an LCLH carrier.

Willingness to pay to switch from FSC to LCLH. For the reduction in amount willing to pay to switch from an FSC to an LCLH carrier, Table 32 shows that only airline service attributes were included in the regression equation—although

demographics and trip attributes were also considered. A passenger who was satisfied with X11 Nonstop Flights provided by an FSC expected the greatest reduction in airfare (\$250 to \$1,000) to switch an LCLH carrier, whereas a dissatisfied passenger would switch for less of a reduction in airfare (\$50 to \$200). A passenger who was satisfied with X8 Airfare and X25 Courtesy and Responsiveness on an FSC expected less of a reduction in airfare (\$50 to \$200) to switch to an LCLH carrier; whereas a passenger who was dissatisfied expected more of a reduction in airfare (\$250 to \$1,000).

Table 32

Willingness to Pay Less to Switch from FSC to LCLH

	Reduction in Airfare	Reduction in Airfare
	Switch to LCLH	Switch to LCLH
Variable	\$50 to \$200	\$250 to \$1,000
X8 Airfare	Х	
X11 Nonstop Flights		Х
X25 Courtesy & Resp	Х	

Passenger insights – why remain loyal to an FSC. Passengers who would remain loyal to FSCs noted they preferred an all-inclusive airfare without the hidden fees and hassles associated with unbundled/a la carte pricing. Also, many FSC passengers called into question whether flying an LCLH carrier would actually be cheaper or lead to a cost savings. They often perceived that flying an LCLH carrier could be equally or more expensive than an FSC once all of the extra fees were accounted for. Passengers who would remain loyal to FSCs overwhelmingly noted that because trans-Atlantic flights were long-haul, the extra services and amenities offered by an FSC were of great importance. FSC passengers who were unwilling to fly an LCLH tended to envision it as a very unpleasant experience, and often had overly negative perceptions about LCLH carriers to the extent they would not even consider them for future trips. Traveling via an LCLH carrier clearly is not for everyone, as some passengers noted they would only fly an LCC if it was on short-haul flights, or they simply did not fly LCCs at all.

- ↔ "Not interested for trans-Atlantic. I'd like more comfort and service for this distance and would prefer to simply pay once and just be able to relax."
- → "Would rather just be able to pay in advance and be done with it. Peace of mind is more valuable."
- → "It's already uncomfortable enough traveling in economy for long-haul flights so I wouldn't want my experience to degrade anymore!!"
- → "My experience with these airlines is that savings are illusionary, typically turns into a bait-and-switch behavior."
- → "I want some service with my ride, not just a seat on the plane. I never like being treated like cattle."
- → "Spending 10 hours on an airplane should be at least tolerable with a minimum of creature comforts; not being nickeled-and-dimed at every turn."
- → "I dislike feeling like a hostage. If people are not buying as many blankets as expected, what's stopping the airline from turning down the heat? I prefer paying once and for all."
- → "Because I'd rather know the full list of flight costs rather than having to add on all the extras and watch the price of ticket climb!"
- → "I really dislike extra fees. I find them particularly annoying and underhanded."

- → "I don't like the potential hidden fees of such airlines; it makes comparisons very difficult when pricing the holiday. It makes me feel the airline is not trustworthy in other aspects when they try to trick you into additional fees."
- → "Feel it's usually too much hassle. Prefer to pay a bit more and not have to worry about seat assignment or having to pay extra for each item you want to bring on board. Usually the luggage allowance on low cost airlines is not sufficient for long haul travel."
- → "A la carte travel is coming. I have too much to think about when traveling to deal with 'one from column A one from Column B.' It will also allow airlines to charge any amount they want. We already deal with the 'let's pump up the bottom line' mentality. A la carte pricing may be all right for the single probably male passenger but for other older passengers, families with children and me it is not appealing. Long haul travel is difficult enough for the average traveller."
- → "For long haul you need comfort, good service, good food and drink, good entertainment, more space. Budget brands usually offer none of these. A long haul flight with basics only would be an unpleasant experience."
- → "After choosing all the amenities needed I think the cost would end up being the same as or more than on the low-cost long-haul airline and all the add-ons would be an irritation."

Passenger insights – why switch to an LCLH. The prime motivation for FSC passengers willing to switch to an LCLH carrier was fiscal. Passengers noted that trans-Atlantic flying was still an expensive endeavor. An Irish male (age 25–34) who flew an FSC noted that, "The high cost of trans-Atlantic flying limits my ability to travel to the USA so I'd be interested in cheaper alternatives." A British male (age 25–34) who flew an FSC stated, "We need more competition out of Seattle to drive prices down for the mass market cabins." Another British male (age 25–34) wrote, "Trans-Atlantic fares remain prohibitively expensive. British Airways, at least, has a superb reputation and I always actively enjoy flying with them—but I would still like the price to come down by about 1/3rd before I think it becomes reasonable." Passengers also expressed that they did not find it worthwhile to spend their dollars on traveling to/from their destinations. An American female (age 25–34) noted that, "If with all of the extra fees I could still save a significant amount of money, it would be worth it. The less I spend on the airfare, the more I can spend while on vacation."

Passengers who were willing to switch to an LCLH carrier were also accepting of an unbundled/a la carte offering, paying only for the amenities and services they would use, and they also planned to show up for their LCLH flight well prepared. An American female (age 18–24) stated, "I am willing to pack my own food, pillow, and blanket and travel with less luggage in order to save money."

Even though passengers were willing to switch from an FSC to an LCLH carrier, they often qualified that statement by noting that other aspects of their experience particularly comfort, service, and amenities—were still important to them. Those willing to switch often fell into one of two camps—price was more important than anything and they would be willing to sacrifice, or they wanted to fly an LCLH carrier but still expected more service and amenities for a long-haul flight. A British female (age 55–64) who flew an FSC noted, "Cost is of high importance to me. I can manage without the frills." In contrast, a French male (age 25–34) wrote, "I could switch to a low cost airline only if a minimum set of services is still provided by the airline company (reasonable width of seats, reasonable price for food and beverages, etc.)."

Several passengers based their willingness to switch decision on a previous LCLH travel experience that satisfied them. A British female (age 45–54) said that she previously had "flown with Norwegian Air. . . . Brand-new Dreamliner planes at really cheap prices and excellent service." FSC passengers also mentioned that low cost did not necessarily equate to low quality. An open-minded British male (age 18–24) stated in regard to LCLH that "An airline could potentially offer a similarly good service for a lower cost, but it's unknown until you have tried one." Alternatively, a handful of passengers were willing to switch, because they were dissatisfied with their FSC for various reasons. Passengers also noted they would switch to an LCLH carrier if it offered convenience. A British female (age 25–34) who flew an FSC noted: "It's important to me to spend as little time traveling as possible to optimize time in my destination—if it was a direct flight I would happily go without extras for the affordability."

Discussion of LCLH vs. LCSH Findings

This section will compare the findings of LCLH versus LCSH passenger survey research to determine how flights of increased stage length affected passenger preferences. This research found that younger trans-Atlantic passengers exhibited a preference for an LCLH carrier—this finding has external validity since multiple LCLH carriers are targeting the younger passenger segment. However, whether or not the age variable truly influences passenger preference toward LCSH carriers has been inconclusive—although the research of O'Connell and Williams (2005) supported the finding of younger passengers preferring LCSH carriers. This dissertation also found that airfare was the number one priority of LCLH passengers—airfare as a key predictor was supported by the research of Jiang (2013) and was consistent with the existing LCSH literature (Forgas et al., 2010; O'Connell & Williams, 2005; Ong & Tan, 2010; Thanasupsin et al., 2010). Yeung et al. (2012) found that airfare was the number one priority for LCSH passengers, and the number two priority for prospective LCLH passengers. While comfort was the second priority for LCLH passengers surveyed in the dissertation, it was deemed unimportant to LCSH passengers in multiple markets (O'Connell & Williams, 2005; Thanasupsin et al., 2010) to the extent that it was often omitted from LCSH survey instruments. Comfort being more important to LCLH than LCSH passengers was a finding supported by the research of Yeung et al. (2012). While this dissertation found that service was the third most important priority of long-haul trans-Atlantic passengers, it was not a reason why passengers selected an LCLH carrier. Yeung et al. (2012) did discover that service was more important to LCLH than LCSH passengers. The passenger comments from the survey indicated that LCLH travelers placed greater importance on aspects such as comfort, service, food and beverage, IFE, and Wi-Fi for long-haul flights. If LCLH carriers opt to fly ultra-long-haul routes in the future, the differences in passenger perceptions of LCLH versus LCSH carriers could become more pronounced.

Resiliency of LCLH Carriers

The LCLH business model has garnered mixed reactions from airline leadership and industry analysts; however, it is gaining traction and significant interest. CAPA will even be holding the first ever LCLH Global Summit in 2018 in Seville, Spain, which is a signal that LCLH is here to stay. The current generation of independent trans-Atlantic LCLH carriers have the resiliency that their predecessors—including Laker Airways, People Express, and Zoom Airlines—lacked. This researcher has identified six reasons for the current resiliency. The majority of these LCLH carriers have a young fleet of Boeing and/or Airbus aircraft, which will buffer them against future fuel price increases. Many of these independent LCLH carriers initially started their operations as LCSH carriers, thus they are experienced at running a low-cost operation and often have feeder traffic at one end or in the middle of their routes to support long-haul operations. The independent LCLH carriers are agile, and they are taking decisive action entering and exiting markets as they see fit to best match their capacity to where the demand lies. The LCLH carriers have a diversified portfolio of routes moving boldly into high-profile markets, such as New York–London, offering service on thin routes that may only sustain one flight per week, and by creating new point-to-point uncontested routes. These LCLH carriers are reducing their reliance on leisure travelers by placing greater emphasis on premium economy cabins and attracting business travelers. Also, LCLH carriers in the trans-Atlantic market have broader aspirations and are seeking to expand their long-haul operations to other parts of the world which are underserved, thus opening a path to sustained growth opportunities. Therefore, the independent LCLH carriers are so firmly

entrenched in the marketplace that FSCs could not easily outmaneuver them or apply competitive pressures to force them out, which was what had occurred in the past.

While the LCLH AWAs in the trans-Atlantic market might have the financial backing of their parent companies and could leverage their resources in regard to their network, feeder traffic, loyalty programs, and relationships; most appear to be lacking the necessary autonomy and cost structure that have been the cornerstone of the success Jetstar and Scoot have achieved in the Asia-Pacific market. It is unclear if these LCLH AWAs will ever play a pivotal role in the trans-Atlantic market, but for now they do not appear to be much of a threat to the independent LCLH carriers. British Airways parent IAG has acquired 4.6% of Norwegian and has made two takeover bids, both of which were rejected (Torrance, 2018). If IAG succeeds in adding Norwegian to its portfolio, it could rapidly scale up its LCLH AWA operations with a modern fuel-efficient fleet, while giving Norwegian the needed cash infusion to keep its operations growing. This could also ease the competitive pressures that IAG is facing in the trans-Atlantic market, which has led to stagnant growth and declining yields, by cooperating rather than competing with Norwegian.

However, with the price of jet fuel on an upward trajectory and with competition on the North Atlantic intensifying as LCLH carriers initiate and expand service, an economic downturn amidst declining yields could put these airlines into a weakened state. Aviation lawyer Brian Havel claims that "not a single LCLH carrier has ever survived a full economic cycle" (Silk, 2018, para. 16). Malaysia Airlines CEO Peter Bellew believes that LCLH carriers are merely the latest fad:

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I fundamentally personally don't believe it will ever work. When oil prices hit and there's some shock to the economic system, if you don't have business class travelers up in the front of a long-haul aircraft it's very, very difficult to make money or break even. (Routes Online, as cited in CAPA, 2016d)

Thus the next economic downturn or oil crisis will determine which LCLH carriers have the capability to survive. According to IAG CEO Willie Walsh:

We need to define what success looks like and I think success will be a long-haul, low-cost carrier that makes money. There will be lots of long-haul low-costs that will set up but which will never make a penny, just as there are lots of short-haul low-cost airlines that don't. (Robertson, 2016, para. 7–8)

In response to the recent trend of LCLH carriers deploying narrow-body aircraft on trans-Atlantic routes from secondary airports, aviation analyst John Strickland stated:

Long haul, low cost is a growing business model but that doesn't mean it is immune to challenges of developing and sustaining smaller regional markets. Such markets tend to be more price sensitive and more seasonal all of which makes airline profitability more elusive. We've recently seen Norwegian cancelling and reducing frequencies on a number of its new European/U.S. regional routes. (Calder, 2018, para. 14–15)

Conclusions

When Sonja and her Norwegian Air Dreamliner sisters began tiptoeing across the Atlantic, British Airways CEO Willie Walsh stated: "We don't see any impact from Norwegian" (Mutzabaugh, 2014, para. 3). However, the trans-Atlantic market has

undergone drastic changes over the past few years leading British Airways to reverse its stance. LCLH carriers are swiftly adding capacity and bringing lower airfares to the trans-Atlantic market that historically has seen scarce competition, and passengers have benefitted from lower airfares and increased nonstop flight options. As a result, FSCs have to compete for long-haul economy class travelers as never before.

Protectionism no longer has a place in the trans-Atlantic market, as Norwegian Air has broken down the barriers that existed with regulators. Speculation that trans-Atlantic LCLH carriers will compromise safety has proven unfounded, as many of these airlines are investing in their fleets by operating brand-new, state-of-the-art Airbus and/or Boeing aircraft. Airports are benefitting from trans-Atlantic LCLH carriers by gaining new international service, a higher frequency of flights, increased competition, and lower fares, which have boosted demand for trans-Atlantic travel. The use of narrow-body jets has enabled LCLH carriers to offer trans-Atlantic flights to/from smaller secondary airports, which was an unforeseen strategy. Trans-Atlantic travel at a lower price point and with the convenience of increased non-stop flight options has led to more choice for passengers in this market than ever before.

While free advertising in the trans-Atlantic market has abounded for LCLH carriers, with their low fares and new service catching the headlines, information from the passenger perspective has been lacking. The emphasis in the scholarly literature was on research from the financial standpoint—and the recency of the business model led to speculation on the passenger element of LCLH. Multiple experts (Francis et al., 2007; Wensveen & Leick, 2009; Whyte & Lohmann, 2015) theorized that passengers would not be willing to give up services and amenities for flights of a long-haul duration. While

there was evidence, as indicated by the rapid expansion and gain in market share, that passengers were flocking to the LCLH carriers in the trans-Atlantic market for their longhaul flights; without any passenger research in the public domain, it is impossible to substantiate what the experiences of these passengers actually were, and how they felt about giving up service and amenities in exchange for a lower fare. And furthermore, it was not known whether trans-Atlantic LCLH was a once-in-a-lifetime experience for these passengers, or if they would be repeat customers who would opt for the LCLH experience again for future travel. Likewise, it is not known how FSC passengers felt about their long-haul air travel experience, and whether they would be willing to forgo services and amenities to switch to an LCLH carrier for a future trans-Atlantic flight. Both LCLH and FSCs cater to passengers with different priorities and needs, and both have a place in the marketplace, which will be elaborated upon further.

Theoretical contributions. The scholarly literature on LCLH contains a lot of speculation as to what trans-Atlantic passengers really want. Due to the recency of the LCLH business model becoming mainstream, this researcher is only aware of three scholarly studies that have been focused on LCLH passenger survey research. While Yeung et al. (2012) surveyed LCSH passengers in Hong Kong regarding their willingness to try an LCLH carrier, it was not known if the respondents had ever experienced long-haul travel. While Jiang (2013) compared service quality of two LCLH carriers— AirAsia X (an independent) with Jetstar (AWA of Qantas)—which both operate in the Asia-Pacific market, FSC passengers were not included in the survey. Rodríguez and O'Connell (2018) considered the willingness of long-haul charter passengers in Spain who had purchased an all-inclusive holiday package to switch to an LCLH carrier.

The first theoretical contribution of this researcher's study comes from the awareness that it is the *first known LCLH passenger survey to be performed in the trans-Atlantic market* with the intent of being published as scholarly literature. Also, another distinguishing characteristic is that this research was performed in the airside departure lounge areas of U.S. airports (LAX and SEA), which is a *rarity* in the literature.

The second theoretical contribution is the establishment of a *factor structure common to both LCLH and FSC passengers*, since this is the first known study to have done so in any long-haul market. The factors consisted of F1 Operations, F2 Comfort, F3 Onboarding, F4 Service, and F5 Flight Schedule—with X8 Airfare remaining a distinct variable. Reducing the large number of passenger satisfaction variables to a manageable set of underlying constructs also proved beneficial for data reduction purposes. Different insights were gleaned from running statistics with the factors versus the individual variables, which led to more meaningful analyses and results.

The third theoretical contribution lies in the fact that this study specifically considers *which factors/variables affect passenger choice* of LCLH or FSC in long-haul markets, as the existing literature found was focused solely on the short-haul contingent. The litany of existing literature evaluating choice of an LCC or an FSC in short-haul markets served as a basis for comparison. A key finding is that *X8 Airfare is most important* to passenger choice of LCLH carrier, and that proved consistent with the existing literature, which noted that it was typically the most important variable for LCSH passengers as well. While it was expected that F2 Comfort, often overlooked in

short-haul passenger survey research, would also be important to long-haul passengers, an unorthodox finding is that it is associated with choice of an LCLH carrier, which is attributed to the new wide-body aircraft that Norwegian and WOW air are operating. F4 Service, which also was often overlooked in short-haul research, is associated with choice of an FSC, confirming that *service matters* to long-haul passengers. F5 Flight Schedule is associated with choice of FSCs, due to their strength in the markets in which passengers were surveyed.

The fourth theoretical contribution is that this is the first known study to evaluate *passenger switching behavior* from an LCLH to an FSC, or from an FSC to an LCLH, in any long-haul air market. Since respondents based their switching decision upon their trans-Atlantic flight experience, this strengthened the validity of this researcher's approach. The use of decision tree analyses illustrates the relationships between variables that affected this switching decision. Furthermore, willingness to pay was analyzed to determine what factors/variables actually affected the amount willing to pay more to switch to an FSC or amount willing to pay less to switch to an LCLH carrier. The open-ended comments on what affected a passenger's switching decision sheds light on passenger experiences that could not have been gleaned from statistical analysis alone— thus *having the voice of the passengers to back up the data* strengthened this research and offered greater insights.

Practical implications. The first practical implication of this research is that *airfare* is the chief predictor of passenger choice of carrier in the trans-Atlantic market, and it is positively associated with LCLH. From the passenger comments, it becomes

evident a subset of price-sensitive LCLH passengers would select the lowest airfare regardless of the lack of amenities and services. LCLH passengers who were Very Dissatisfied/Dissatisfied with airfare were the least likely to switch to an FSC, as they perceive it to be more expensive. Of the females who were not satisfied with the service of their FSC, if they were Very Satisfied with airfare they would remain loyal. This leads into a recent development of the introduction of HBO fares by FSCs in the trans-Atlantic market. While FSCs want to offer trans-Atlantic fares at a lower price point, it is not known to what extent they might be competitive on price, or if they would be capable of attracting the most price-sensitive of travelers.

The second practical implication of this research pertains to *comfort*, the number two priority affecting passenger choice, which also is associated with LCLH carriers. There is compelling evidence that fleet type leads to more favorable perceptions of comfort from those who have flown an LCLH carrier, considering that Norwegian and WOW air are now deploying new aircraft on trans-Atlantic routes. Also, it is apparent that comfort is important to older passengers, as those who were 55+ considered their satisfaction with comfort as a decisive element regarding whether they would remain loyal to an LCLH carrier or switch to an FSC.

The third practical implication is that *flight schedule* does affect passenger choice, and it is positively associated with selection of an FSC. In major trans-Atlantic markets, FSCs often hold the advantage by offering passengers multiple frequencies and times of day to suit travelers' preferences, which is supported by this research. One advantage of LCLH carriers like Norwegian Air and WOW air is that through launching multiple new routes, they are giving passengers unprecedented options for *nonstop service* in the transAtlantic market, which is shown in this researcher's data. Passengers often favor the convenience of a nonstop flight over the hassle of connecting via a hub or an indirect routing—this is validated by passenger comments specifically stating that nonstop service had been the prime reason they had chosen WOW air. It is not known how out-of-the-way secondary airports that airlines such as Norwegian are utilizing for LCLH flights could affect passenger perceptions of flight schedule and convenience. An advantage that LCLH AWAs hold is they can leverage the resources and relationships of their parent companies such as with codesharing and alliances, thus enhancing their market presence and flight schedule, giving them an advantage over independent LCLH carriers.

The fourth practical implication is that the majority of passengers surveyed *prefer the offerings of FSCs*, as 76% of passengers would remain loyal. This also signals an opportunity for FSCs to acquire former LCLH passengers, because 45% of them say they would switch to an FSC for future travel. Unlike most short-haul markets with commoditized offerings, at the time this survey was conducted, there still was differentiation within the products offered by FSCs in the trans-Atlantic market, relative to LCLH carriers. Passengers found service of FSCs to be important for long-haul trans-Atlantic flights, and specifically service offered by the cabin crew. Passengers liked that FSCs had an all-inclusive airfare, which included service, IFE, pillows, blankets, seat assignment, checked and carry-on baggage, and food and beverage; and they were willing to pay for it. While in the domestic market, FSCs might have been able to pull away services and amenities to compete on the basis of price; this research shows that longhaul trans-Atlantic passengers value all-inclusive offerings. The fifth practical implication is that a subset of *trans-Atlantic passengers do want an LCLH experience in exchange for a lower fare.* Therefore, 55% of LCLH passengers say they will remain loyal to this carrier type, and it held particular appeal for those who are more price-sensitive, and also for younger travelers. LCLH passengers who were planners and were well prepared for the experience and had expectations inline with reality were often satisfied and stayed loyal because of the airfare, or they actually found they liked their chosen LCLH carrier and other aspects of their offering. Furthermore, 24% of FSC passengers say they would be willing to switch to an LCLH carrier, with females citing dissatisfaction with service or airfare as reasons why they might switch.

The sixth practical implication is that *age affects passenger choice of carrier*, with younger passengers—who also tend to have more limited financial means—favoring LCLH carriers. For LCLH respondents surveyed, those who earned less than \$25,000 comprised 57% of 18 to 24 year olds and 82% of 18 to 34 year olds. Thus the \$25,000 and under category is disproportionally comprised of Millennials who may still be in college or not yet established in the workforce. New LCLH carriers LEVEL and Joon were both created with the intent of appealing to the younger demographic (Millennials), and the findings of this dissertation support the fact that this group is the ideal demographic to target.

The seventh practical implication pertains to *aircraft manufacturers*. Boeing's commitment to the passenger experience with its B787 Dreamliner aircraft was evident in this research, with passengers noting they preferred this fleet type. As the LCLH business model flourishes and carriers seek to expand into new long-haul markets,

passengers will be spending increased flight durations on aircraft often without the services and amenities that have traditionally been part of the long-haul experience. Furthermore, single-aisle aircraft derivatives with cramped quarters are being pressed into service on flights of increasing stage lengths to take advantage of their increased range. Thus aircraft manufacturers need to put renewed focus on the economy class cabins in partnership with seat vendors, in-flight connectivity providers, and cabin designers to continually improve the passenger experience and perceptions of comfort.

However, aircraft manufacturers did not foresee the needs of LCLH carriers operating in high-density, single-class configurations when they developed their new wide-body aircraft. While the A330-300 has a maximum capacity of 440 passengers, LCLH carrier Cebu Pacific learned that the B787-9 air conditioning system might have to be redesigned to be capable of an equivalent passenger count, whereas the A350 could require additional emergency exits to be able to carry more than 440 passengers—in order to rationalize the added fuel expenditures due to its increased weight (CAPA, 2018d). As Boeing considers its development of a mid-size long-haul jet, it must make provisions to ensure that it would be suitable for the needs of LCLH carriers; because as the business model spreads to emerging markets and geographic regions where passengers are increasingly price sensitive, densification could be of increased importance for LCLH carriers that wish to maintain fares at the lowest possible price point.

Limitations. Nine specific limitations pertain to the dissertation. First, since passengers were predominately surveyed from routes to/from West Coast Airports SEA

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and LAX, it is not known to what extent passenger perceptions and willingness to switch/pay differ from passengers who take shorter trans-Atlantic flights from the Eastern Seaboard of the U.S. Second, the survey was adversely impacted by passengers who had not yet taken their trans-Atlantic flight being ineligible to complete the survey in-person, which lowered response rates and decreased willingness to participate. Third, neither a pure leisure market such as Orlando nor one of the highest density markets like New York was considered. Fourth, not all trans-Atlantic LCLH carriers had equal representation in the passenger survey. Due to airport selection, the sample consists primarily of Norwegian Air and WOW air passengers. Only a token number of passengers were surveyed from other LCLH carriers. Fifth, fleet type could not be used in the statistical analysis, since this data was self reported by passengers and proved unreliable. However, generalizations can be made on the basis of airline flown, since the fleet types that the majority of passengers flew on were known. Sixth, non-response bias testing for the overall survey could not be performed, due to the sensitivity involved in asking demographic/traveler characteristic questions in the U.S. of passengers who did not want to participate. Seventh, when the passenger switching question was asked, increased comfort was not mentioned when asking if a passenger would be willing to pay more to fly an FSC. Although FSCs may not offer appreciably increased seat pitch/width, the results could have differed if this item was specifically addressed. Eighth, the results from willingness to pay analysis are not as meaningful as they might have been if data were available on what airfare passengers had paid. Ninth, in the intervening months since this survey was conducted, Norwegian's strategy has shifted to aggressively pursue business travelers in order to fill its premium economy cabins on

trans-Atlantic flights. Insufficient data was collected on this demographic to conduct further statistical analysis: only 5% of passengers were traveling for business (n = 38), 4% of LCLH passengers surveyed had flown premium economy (n = 32), and a mere 0.4% were business travelers who had flown premium economy (n = 3).

Recommendations for LCLH Carriers

The first recommendation is that LCLH carriers provide complimentary water, which would go a long way in generating goodwill amongst passengers. Having to pay for water, or remaining thirsty and dehydrated, alienates passengers, some to the extent they would be unwilling to ever fly an LCLH carrier again. In making the above recommendation, however, it is understood that having bottled water available free of charge on flights would increase operating costs for the LCLH carrier, because the added weight of the water would increase fuel burn. Furthermore, airlines are likely counting on the sale of water to offset catering costs and contribute to ancillary revenue. A costeffective solution would be for LCLH carriers to provide tap water at no charge to passengers from the aircraft's potable water system as an alternative to bottled water. However, while aircraft tap water is considered fit for human consumption, the facts are that it might hold limited appeal for passengers and it also might contain bacteria. However, the B787 uses high-intensity ultra-violet light to kill bacteria and viruses making its potable water supply more palatable. Airline staff should notify passengers at check-in and also make an annoucement at the gate, well in advance of the boarding process, to allow passengers sufficient time to purchase bottled water or other beverages of their choice. Adequate hydration on long-haul flights is mandatory, since it is wellknown that remaining seated for extended periods of time can lead to deep vein thrombosis, a condition that can occur and result in a medical emergency, due to a passenger having a stroke or heart attack, during the flight.

The second recommendation is for LCLH carriers to focus on customer transparency strategies, given that 45% of passengers who flew an LCLH would not choose this carrier type again. Although it is acknowledged that LCLH carriers may not be as concerned with reducing passenger attrition, since they may be less reliant upon repeat customers for long-haul leisure travel and would rather find new passengers to fill their trans-Atlantic flights, good marketing must always be an ongoing effort in any business, most especially those with heavy competition. LCLH carriers must make every effort to communicate the realities to be encountered on a flight well in advance of arrival at the airport or even the gate. Meals, snacks, and beverages are not included unless the customer pre-orders them or has paid a fare that includes them. Passengers flying LCLH often make the assumption that amenities will be provided on an extended-duration flight, which is no longer the case these days. Boarding an LCLH flight without knowing that numerous perks once provided automatically are now only available for purchase if quantities hold out, will definitely deter unaware passengers from considering that airline for future flights, especially if supplies aboard were limited, as the airline neglected to estimate passenger needs accurately.

In addition, LCLH passengers expressed a desire for Wi-Fi on long-haul flights at the time the survey was conducted neither Norwegian or WOW air offered it. Norwegian has announced that it will be configuring its B787 and B737MAX aircraft flying trans-Atlantic routes for Wi-Fi, which will be launched by the end of 2018, with low-speed connectivity being complimentary and high-speed connectivity offered for a fee (Moores, 2018). WOW air should consider offering Wi-Fi to be competitive with the rest of the trans-Atlantic LCLH carriers which are offering this service including Eurowings, French Bee, LEVEL, Primera Air, and WestJet. Inmarsat's (2017) In-Flight Connectivity Survey lends support to this recommendation as it found that 60% of passengers considered Wi-Fi to be essential, 89% of leisure passengers would be willing to pay for Wi-Fi on a long-haul flight, and those most willing to pay were 25 to 34 year olds—which is the target demographic for LCLH carriers.

The third recommendation is that LCLH carriers continue efforts to make their operations appealing to business travelers. Norwegian is upping its premium economy seat count on B787-9s from 35 to 56 seats due to high demand on routes to/from London (Spinks, 2018a). In the New York and Los Angeles markets, Norwegian recently has bolstered its service, thus it now has London flights arriving/departing in the morning as well as the evening, which is a strategy to appeal to business travelers. Independent LCLH carriers, like Norwegian and WOW air, that do not have connectivity on the U.S. end of their routes might want to consider forming alliances and/or partnerships with U.S. LCCs to generate feeder traffic to support long-haul routes. While Norwegian is a member of Airlines 4 Europe, it has not established any partnerships or alliances with U.S. carriers. Passengers would benefit from online connections making an itinerary with more than one airline a more seamless booking and travel experience. Furthermore, an alliance or partnership to facilitate the process of Norwegian's passengers earning and redeeming frequent flier miles linked to U.S. LCCs would provide a significant benefit, thus encouraging passsenger loyalty on both sides of the Atlantic. Only 15% of

Norwegian's passengers surveyed were frequent flier program members. Since WOW air's one-stop service between the U.S. and mainland Europe is less convenient than nonstop service on Norwegian, passengers traveling for business purposes would have to be given worthwhile incentives to fly WOW air. To have greater appeal to business travelers, a frequent flier program would be a logical next step for WOW air. For example: A promotion offering a free trans-Atlantic voucher following the completion of X flights on Wow air; or a smaller incentive for less frequent fliers of a free beverage or an extra carry-on bag.

The fourth recommendation involves strategies for LCLH carriers that want to extract the maximum ancillary revenue from their passengers. A gripe that LCLH passengers had was they would pay for advance seat assignments, only to learn that those who had not paid extra were still allowed to sit together, which seemed unjust to them. If LCLH carriers withhold seat assignments from passengers who do not pay for specific seats until just prior to boarding, travelers could then be given the option, at the gate, of paying a higher fee to sit together. Passenger feedback indicates that long-haul travel, in general, is an uncomfortable experience made more so by passengers in the seats in front of them reclining and, thus, diminishing available legroom and personal space. If the number of reclining seats were reduced and there was an additional charge for passengers selecting those seats, and the fare for those seated behind recliners was concurrently reduced, perhaps this would alleviate some of the complaints and engender more passenger loyalty on LCLH carriers. LCLH carrier Scoot has taken a tactic from the playbook of movie theaters by banning outside food and drinks on its flights. Trans-Atlantic LCLH carriers could follow suit to bolster in-flight food and beverage sales.

However, this would require that LCLH carriers adequately provision their flights with food and beverages. Perhaps, as an alternative, LCLH carriers could institute a fee for outside consumption of food and beverage, just as fine dining establishments sometimes charge a corkage or cakeage fee for consumption of outside liquor or cake at a restaurant. This could offset declines in ancillary revenue, due to increased transparency of the fee structure, but it would also reduce on-board food and beverage sales.

While the above strategy might be immediately profitable for an airline, one of the issues facing LCLH carriers in today's trans-Atlantic market is the loss of repeat customers. If all of the revenue-generating strategies suggested above were to alienate passengers, a simple questionnaire given to those on board such a flight might list those strategies beneficial to an airline's bottom line and ask which three would have to be eliminated, for example, in order to entice that passenger's loyalty for a future flight.

Recommendations for FSCs

The first recommendation is for FSCs to keep their all-inclusive economy class product (i.e. seat assignments, food and beverage, IFE) intact in the trans-Atlantic market. The statistical analysis for this dissertation shows that multiple aspects of flying trans-Atlantic economy are positively associated with choice of FSCs including service, cabin crew, food and beverage, reputation, and checked and carry-on baggage policies and fees. While many of these attributes have been overlooked or deemed unimportant in short-haul passenger survey research, they have proven to be vitally important to longhaul travelers. While 76% of FSC passengers say they would remain loyal to this carrier type, 45% of LCLH passengers state their intentions to switch to an FSC for future transAtlantic travels and are willing to pay more in airfare. While in short-haul markets FSCs have been able to pull away services and amenities to compete on the basis of price with LCCs and ULCCs, long-haul markets cannot be treated in the same manner as a commoditized product. This has been reiterated repeatedly by passenger comments. FSCs should focus on stepping up their on-board product offerings for economy class travelers and seeking greater differentiation from LCLH carriers to attain a sustainable competitive advantage, so that FSC passengers will find the experience worthwhile enough to fly that airline again. FSCs really need to follow in the footsteps of Norwegian and institute free Wi-Fi, so as not to be upstaged by an LCLH carrier.

The second recommendation is for FSCs to focus on comfort, which is an area commonly noted by passengers as needing improvement. For trans-Atlantic routes where FSCs are facing the most intense competition, going head-to-head with LCLH carriers and particularly on those routes which appeal to price-sensitive business travelers, FSCs should consider strategically deploying the state-of-the-art B787/A350 type aircraft that exist in their fleets, as they offer the perception of greater comfort. Another means of improving comfort is by offering preferable seating that might feature extra legroom or have other appealing characteristics that passengers might be willing to pay more to get. Furthermore, to bridge the gap between economy and business class and match the offering of LCLH carriers, FSCs lacking a premium economy product in the trans-Atlantic market should consider reconfiguring their aircraft cabins to include it. Research by Hugon-Duprat and O'Connell (2015) found that in the trans-Atlantic market with a B747-400 aircraft "premium economy generates the highest revenues per cabin when compared to its cost of production" (p. 19).

The third recommendation is for FSCs to conduct research examining the concept of competing with LCLH carriers for price-sensitive, trans-Atlantic travelers, since HBO fares were implemented. It poses a great challenge for FSCs to simultaneously satisfy the needs of economy class passengers who prefer an all-inclusive offering, as well as those who make their air travel decisions based upon the lowest airfare, which is the direction in which things are moving. While many FSCs have intently studied their short-haul passengers and their responses to basic economy fares, this dissertation shows that longhaul travel and what passengers want is completely different, and how they react to the loss of services and amenities they have grown accustomed to may not be exactly what the FSCs expect. Therefore, FSCs need to conduct their own research and analysis through surveying passengers, forming focus groups, analyzing airline website airfares through Internet searches, and garnering data from other booking channels to gain an understanding of this phenomenon in long-haul markets; so that their decisions are data driven rather than merely being reactionary. It is critical that FSCs, in running their businesses, bear in mind that passengers will vote with their legs and their wallets, thus making the issues of legroom and price significant enough to drive decisions and foster changes that need to be made for FSCs to maintain viable and profitable businesses.

Future Research

Given the lack of passenger survey research on LCLH carriers and the recent resurfacing of this business model, lots of opportunities exist for future research. Firstly, passengers from additional trans-Atlantic LCLH carriers could be surveyed so that the results will have broader generalizability, since this research is focused predominately on Norwegian Air and WOW air. Secondly, the results of independent LCLH carriers could be compared with those from carriers which are AWAs (i.e. Jetstar, Scoot, LEVEL, Joon). Thirdly, similar research could be performed in the Asia-Pacific market regarding passenger choice of an LCLH or an FSC, for a comparative analysis with the trans-Atlantic market. Fourthly, an evaluation can be made, focused on how fleet type (widebody vs. narrow-body; new vs. old), airport type (primary vs. secondary), flight duration (shorter from East Coast vs. longer from West Coast), level of competition on routes (uncontested vs. LCLH/FSC), and markets with differing demographics (i.e. Orlando is more leisure/family centric, Fort Lauderdale has lots of retirees, and New York is a key business market but also attracts tourists) affect LCLH trans-Atlantic passenger perceptions. Fifth, there are several variables which could be considered for future research. Two Likert variables that both Chen and Chao (2015) and Min and Min (2015) considered in their research were Connecting Flights and Codesharing—both should be considered for future research, since they are of relevance particularly to recently established LCLH AWAs. A demographic variable that could be included is whether a passenger was traveling alone, with family, friends, or with other travel companions. Two dependent variables could be considered for logistic regression: non-stop versus connecting flights using binomial logistic regression, or market share using multinomial logistic regression. Sixth, FSC economy passengers could be surveyed regarding their attitudes and perceptions pertaining to HBO or basic economy fares in the trans-Atlantic market, and also toward their receptiveness to a further unbundled no-frills offering. Seventh, cross-price elasticity could be evaluated by obtaining airfare data from passenger airlines, and utilizing it in conjunction with survey data that focuses on

willingness to pay. Eighth, stated-preferences research could be conducted to further evaluate willingness to pay and decisions pertaining to comfort, service, and amenities of LCLH and FSC passengers in the trans-Atlantic market. Finally, it could be beneficial to study premium economy passengers and business travelers more intently since LCLH carriers, particularly Norwegian, are targeting this demographic.

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APPENDIX A

Summary of Passenger Choice Literature

Author(s)	Vear	Purnose	Sample Size,	Methodology	Impact Variables or Factors	Key Findings
Proussaloglou & Koppelman	1995	Passenger choice of carrier, and determination of factors that influence market share.	2,006 respondents from Chicago and Dallas via mail in 1990.	Survey research. Cluster analysis to identify groups of travelers based upon air travel experience. Multinomial logistic regression.	 On-Time Reliability Schedule Convenience Safety Performance Low Fares Overall Service Quality Frequent Flier Program Market Presence 	Overall, the relative importance of factors was: [1] Schedule Convenience, [2] Low Fares, and [3] On-Time Reliability. Leisure travelers prioritized Low Fares, whereas frequent travelers prioritized On-Time Reliability. Frequent Flier Programs generate a <i>loyalty effect</i> , particularly for members who travel often on a given carrier.
Alamdari	1999	Impact of in-flight entertainment system on passenger choice of airline.	100 passengers surveyed.	Survey research. Descriptive statistics.	 Reliability Punctuality Schedule Flight Crew Seating Comfort Image of Airline Price Previous Experience Frequent Flier Program Aircraft Type In-Flight Entertainment 	Leisure travelers indicated a relative importance of: [1] Price, [2] Seating Comfort, and [3] Reliability and Punctuality. Business travelers pointed to a relative importance of [1] Reliability, [2] Punctuality, and [3] Schedule. IFE was not deemed important regarding passenger choice of airline, although passengers liked having it.
Proussaloglou & Koppelman	1999	Passenger choice of airline, flight, and fare class.	Mail survey for phase 1, and phone survey for phase 2 with respondents from Chicago and Dallas.	Survey research. Reported choices for phase 1, and stated preferences for phase 2. Econometric models of carrier, flight, and fare class.	Fare Class Market Presence Quality Frequent Flier Program Fare Levels Flight Schedule	Passenger choice of airline was improved by the carrier having a substantial market presence, good service quality, and by the passenger being a member of its frequent flier program. Leisure travelers were more affected by airfare, and business travelers by schedule delavs.
Sultan & Simpson	2000	Impact of nationality on perceptions of service quality in the trans-Atlantic market.	1,956 U.S. and European citizens on trans-Atlantic flights in 1994.	Survey research. T-tests.	SERVQUAL Scale • Tangibles • Reliability • Responsiveness • Assurance • Empathy	U.S. and European citizens agreed with order of importance of SERVQUAL factors: [1] Reliability, [2] Responsiveness, [3] Assurance, [4] Empathy, and [5] Tangibles. U.S. citizens had a more favorable evaluation of service quality than European citizens for both U.S. and European airlines.
Mason	2001	Passenger choice of LCC or FSC in the U.K. for short-haul business travel.	227 business travelers at London– Heathrow who flew an FSC, or those at Luton Airport who flew LCC easyJet, in 2000.	Survey research. Analysis of Variance (ANOVA).	Punctuality Frequency Price Ticket Flexibility In-Flight Service Frequent Flier Program Business Lounge	Business travelers flying an FSC rated as most important: [1] Punctuality, [2] Frequency, and [3] Ticket Flexibility. Business travelers flying an LCC rated as most important: [1] Punctuality, [2] Frequency, and [3] Price. LCC travelers rated Price as more important than FSC travelers did. FSC travelers rated In-Flight Service, Frequent Flier Program, and Business Lounge as more important than LCC travelers did.

Author(c)	Voor	Purnoso	Sample Size,	Mathadalam	Impact Variables or	Koy Findings
Gilbert & Wong	2003	Passenger expectations of airline service in Hong Kong.	328 passengers at Hong Kong International Airport in 2001 who were North American, Western European, Chinese, or Japanese.	Survey research. Independent sample t- test. ANOVA.	Assurance Reliability Responsiveness Flight Patterns Employees Facilities Customization	Assurance (Safety) was deemed most important to travelers, with consistent expectations, regardless of nationality or trip purpose. Japanese expected more regarding service. Japanese and Chinese expected more regarding IFE. North Americans and Western Europeans expected more from Frequent Flier
Lu & Tsai	2004	Impact of larger aircraft seats on passenger choice of Taiwanese carrier.	192 passengers at Kaohsiung Airport flying to Taipei.	Survey research. Descriptive statistics for factors affecting passenger choice (listed out) and satisfaction. Binary logit model for stated preferences.	 Schedule of Time Table Safety Ticket Price Seat Comfort Airline Image Punctuality In-Flight Service Frequent Flier Member Reservation & Check- In Service Aircraft Type 	Leisure travelers considered the most important: [1] Schedule of Time Table, [2] Safety, and [3] Ticket Price. Business travelers considered most important: [1] Safety, [2] Schedule of Time Table, and [3] Seat Comfort. Seat comfort was more important to business than leisure travelers. Passenger preference was indicated for a carrier that offered larger seats; however, the relationship with ticket price was not examined.
Suzuki	2004	Impact of prior airline service failure on choice of carrier.	531 trip data sets collected in 2001 from passengers who had flown from Des Moines, Kansas City, Minneapolis, or Omaha.	Survey research. Multinomial logistic regression models were developed: no carryover model considered airline attributes, while the loss-aversion model considered airline and service-failure attributes.	 Frequent Flier Program Airfare Flight Frequency Flight Miles Flight Legs Seat Denials Flight Delays Baggage Mishandling 	Since the fit of both logit models was comparable, it was determined that prior service failure did not affect choice of carrier. Passenger choice of carrier was influenced by Frequent Flier Program, Airfare, Flight Miles, and Flight Legs.
O'Connell & Williams	2005	Passenger choice of LCC or FSC in Europe and Asia.	281 Ryanair or Aer Lingus passengers at Cork and Shannon Airports in Ireland.247 AirAsia or Malaysia Airlines passengers at Kuala Lumpur Airport in Malaysia.	Survey research. Descriptive statistics. Factors were placed in rank order. Willingness to switch from/to LCC or FSC asked on a percentage basis of fare (10%, 20%, 30%, or no switch).	Quality Reliability Connections Fare Flight Schedule Frequent Flier Program Safety Service Comfort Company Policy Internet Holiday Package Miscellaneous	Fare was the key determinant for passenger choice of LCC. The top three reasons for choosing Aer Lingus: [1] Reliability, [2] Fare, and [3] Flight Schedule. If an FSC reduced fares by 30%, then 46% of Ryanair passengers would switch to an FSC. If an FSC increased fares by 30%, then 43% of Aer Lingus passengers would switch to an LCC. 28% of Ryanair's passengers would remain loyal.
Fourie & Lubbe	2006	Business traveler choice of LCC or FSC in South Africa.	100 business travelers at Johannesburg Airport.	Survey research. Mann–Whitney U test utilized to evaluate passenger ratings of LCC and FSC factors.	Seat Comfort Schedule/Frequency Price Pre-Seating Cancellation Charges Airport Lounge Frequent Flier Program Business Class Meals & Drinks Method of Payment In-Flight Entertainment	Factors deemed most important were the same for those who flew an LCC or FSC: Seat Comfort, Schedule / Frequency, and Price. In- Flight Entertainment was deemed least important. Factors rated higher by FSC travelers that were statistically significant: Frequent Flier Program, Schedule/Frequency, Meals and Drinks, Airport Lounge, Business Class Option, and Pre-Seating

			Sample Size,		Impact Variables or	
Author(s)	Year	Purpose	Location, When	Methodology	Factors	Key Findings
Pham & Simpson	2006	Impact of frequency of use on service quality expectations in the trans-Atlantic market.	601 passengers while on a trans- Atlantic flight.	Survey research. Cronbach's alpha used to verify items in scale- represented factors. T-test and Mann– Whitney Z test utilized.	SERVQUAL Scale • Tangibles • Reliability • Responsiveness • Assurance • Empathy	All passengers rated factors: [1] Reliability and [2] Responsiveness. Assurance had statistically significant differences for 1-2 times and 3 times per year travelers; and 7-12 and > 12 times per year passengers. Poliability had statistically
	2005	D. J. J.				significant differences for 7- 12 and > 12 times per year passengers.
Huse & Evangelho	2007	Business traveler heterogeneity regarding LCC or FSC users in Brazil.	91 Brazilian business travelers at Santos Dumont Rio Airport.	Survey research conducted in interview format. EFA to identify business traveler types. Ordered discrete response model controlling for route and passenger characteristics.	 VIP/Busness Lounges In-Flight Services Frequent Flier Program Frequency Punctuality Parking Discounts Hotel Discounts Check-In Ticket Emission Flexibility Red-Eye Flights 	Airfare excluded from study. Business travelers were grouped into <i>luxury-loving</i> and <i>no-frills</i> classifications. "By having access to the low- cost product, passengers tend to reasses their valuations of attributes previously thought to differentiate between FSC and LCC users and are likely to make up their minds about the value for money of the full-service product" (p. 266).
Park	2007	Buying behavior of passengers by foreign or national airline flown, seat class, and usage frequency in the Korean and Australian markets.	592 Korean passengers who had flown from Incheon. 501 Australian passengers who had flown from Sydney.	Survey research. CFA used for service dimensions. One-way ANOVA to evaluate differences by airline. Independent sample t- test used to evaluate differences by seat class and usage frequency.	 In-Flight Service Reservation-Related Service Airport Service Reliability Employee Service Flight Availability Overall Service Quality Ticket Price Value Passenger Satisfaction Airline Image 	There were statistically significant factors affecting buying behavior when evaluated by airline flown, seat class, or usage frequency. Factors that influenced buying behavior were inconsistent between the Korean and Australian markets, indicating that the findings of this study could be localized to those regions.
Chen, Peng, & Hackley	2008	Taiwanese student choice of long-haul airline on Taipei- London route.	60 Taiwanese students attending U.K. universities. 40 students selected from original participants.	Survey research to identify pertinent factors for the first phase. Semi-structured interviews collected qualitative data on factors for second phase.	 Premium Economy Web Service Flight Attendant Service Quality Quality of Food Aircraft Type Seating Comfort IFE System Student Discounts Number of Transfer Points Safety Brand Image & Reputation 	Regarding the in-flight environment, students prioritized food and seat comfort above in-flight entertainment and service quality. The interest that students expressed in the Elite Class offered by EVA Airlines demonstrated that price was not always the prime criterion, and that there could be a willingness to pay more for a premium economy offering.
Balcombe, Fraser, & Harris	2009	Passenger willingness to pay for in-flight service and comfort on a hypothetical charter flight of 4.5– 5.5 hour duration.	568 responses from passengers surveyed via online travel website.	Survey research. Focus groups and interviews were used for survey development. Choice experiment. Bayesian methods used to estimate mixed logit specification.	 Seat Pitch Seat Width Meal Beverage / Bar Service In-Flight Entertainment Ticket Price 	Older travelers or those with a higher income level were more willing to pay for comfort. Men preferred seat pitch, whereas women preferred seat width. Younger travelers or men were more willing to pay for IFE. Younger travelers or those with less education were more willing to pay for bar service. Travelers were willing to forgo a meal; however, they expected a decrease in ticket price in return.
Chiou & Chen	2010	Passenger choice of LCC in China.	968 passengers of LCC Spring Airlines.	Survey research. SEM to determine if the FSC relationships between constructs were relevant to an LCC.	Service Expectation Service Perception Service Value Passenger Satisfaction Airline Image Behavioral Intentions	Four hypotheses were unsupported for LCC passengers. The strongest relationship for an LCC was Service Value having a positive effect on Behavioral Intentions.

			Sample Size,		Impact Variables or		
Author(s)	Year 2010	Purpose Passanger lovalty to	Location, When	Methodology Survey recearch	Factors Satisfaction	Service quality and airford	
Sanchez, &	2010	LCC or FSC on	Iberia, British	Survey research.	Perceived Value	were the main determinants of	
Palau		London-Barcelona	Airways, or easyJet	CFA followed by SEM.	Trust	LCC satisfaction.	
		route.	at Barcelona Airport in 2007		 Loyalty 	Crew professionalism was the	
			m 2007.			main determinant of FSC	
0.0.7	0.010				_	satisfaction.	
Ong & Tan	2010	LCC or FSC in	LCC AirAsia or FSC	Survey research.	 Fare Flight Schedule 	to choose an FSC if they had	
		Malaysia.	Malaysia Airlines at	Logistic regression.	Demographic	postsecondary education or	
			Penang Airport in 2008		Characteristics	were traveling for business.	
			2008.		Trip Attributes	Passengers were more prone	
						to choose an LCC if they	
						airfare important.	
Thanasupsin,	2010	Passenger choice of	2,000 passengers of	Survey research.	Safety	Fare was the primary factor	
Chaichana, & Pliankarom		LCC or FSC in Thailand	LCCs AirAsia, One- Two-Go, or Nok	Mann-Whitney II test	Punctuality	that influenced passenger choice of LCC	
Thunkuronn		Thanana.	Air; or FSC Thai	utilized to evaluate	Comfort	choice of Ecc.	
			Airways at Don	passenger ratings of	 Reliability 	Punctuality, Service, and	
			Bangkok in 2006.	LCC and FSC factors.	In-Flight Food / Deverges	factors that influenced	
			0	A discrete logit choice	In-Flight Entertainment	passenger choice of FSC.	
				model was utilized to determine what factors	Cabin Quality	Passenger ratings of LCC and	
				affected passenger	On-Board Service Ground Service	FSC carriers were statistically	
				choice of an LCC or	Flight Schedule	significant for all factors	
				150.	· Ease of Ticket Buying	except Flight Schedule.	
				Factors utilized in the	Public Relations	Variables used in the logit	
				evaluate impact on	Fare Promotion	deviation to income ratio.	
				demand.		waiting time deviation *	
						income, punctuality, and safety	
Castillo-	2011	Passenger choice of	19,930 passengers at	Survey research.	Demographic	Demographic characteristics	
Manzano &		LCC or FSC in Spain.	Spanish airports	Logistia regregation	Characteristics	gender, age, education level,	
Gómez			during 2005–2007.	Logistic regression.	Trip Attributes	not significant.	
						stays or who were frequent	
						fliers were more likely to	
						choose LCC.	
						Travelers with connecting	
						flights or weekend travel were	
Lambert & Luiz	2011	Service quality	18 airline and travel	Interviews and survey	SERVQUAL Scale	Reliability was ranked as the	
		expectations on long-	industry managers.	research.	Tangibles	most important factor by both	
		flights.		Content analysis for	 Reliability Responsiveness 	airline and travel managers.	
		Ũ		interview data.	Assurance	While airline managers	
				Thurstone Case V	Empathy	important they noted that it	
				method for factor		received a lot of emphasis at	
Mikulić &	2011	Impact of service	30 airline passengers	rankings. Survey recearch	Sarvias Quality	their airline.	
Prebežac	2011	quality and price on	and 4 experts for	Sarvey research.	• Image	influenced by Price, whereas	
		passenger loyalty and	survey development.	Content analysis and	Loyalty	FSC passengers were most	
		LCC or FSC.	986 Croatians who	survey development.	 Price Offer of Flights & 	Programs.	
			were passengers of	Multi loval formativa	Destinations	Departing Service Delichille	
			FSC Croatia	partial least squares	Ticket Purchase	LCC passengers considered	
			Airlines, or FSC	method.	Airport Experience	Safety most important,	
			Airport in 2008.		 Flight Experience 	considered On-Time	
			1		Service Reliability	Performance most important.	
						Regarding Weekly Flight	
						Frequencies, they were	
						important to FSC passengers but not important for LCC	
						passengers.	
Pham	2011	Impact of gender on	642 passengers	Survey research.	SERVQUAL Scale	The factors had same order of	
		expectations and	Atlantic flight.	Cronbach's alpha used	 Tangibles Reliability 	[1] Reliability,	
		perceptions in the	-	to verify items in scales	 Responsiveness 	[2] Responsiveness,	
		trans-Atlantic market.		representing factors.	Assurance Empathy	[5] Assurance, [4] Empathy, and [5] Tangibles.	
				Levene's test of equality	- Empany		
				of variances, and t-test used for factors Mann-		Assurance was the only factor with a statistically significant	
				Whitney U test and		difference by gender, with	
				Wilcoxon W test used		women rating it more highly.	

Author(s)	Year	Purpose	Sample Size, Location, When	Methodology	Impact Variables or Factors	Key Findings	
Ringle, Sarstedt, & Zimmermann	2011	Impact of perceived safety on customer satisfaction.	1,031 passengers at a major Western European airport.	Survey research. SEM.	 Safety Ground Service Flight Service General Capability Customer Satisfaction Customer Loyalty 	Perceived Safety positively impacted Customer Satisfaction of leisure travelers; however, there was no relationship for business travelers.	
						Ground Service, Flight Service, and General Capability had a positive impact on Customer Satisfaction for all travelers.	
						Customer Satisfaction and Customer Loyalty had a positive association for all travelers.	
Chang & Sun	2012	Passenger choice of nonstop LCC, nonstop FSC, or indirect FSC flight in the Taiwan–China market.	30 passengers who had traveled from Taipei to Beijing in 2010. 286 passengers at Tao-Yuan Airport in Taiwan in 2011.	Survey research tor first phase to identify factors that could affect passenger choice of carrier. Stated choice scenario questions for second phase, which included Fare, Arrival Time, Service Frequency, Destination Airport, and Luggage Restrictions.	 Punctuality Nonstop or Not Legroom Fare Arrival Time Airport Access Costs Airport Facilities Flexibility of Booking Changes Service Frequency Destination Airport Booking Channel Luggage Restrictions 	Fare, Destination Airport, and Luggage Restrictions affected the flight choice of all travelers, with Arrival Time important solely for leisure travelers. Travelers who considered fare most important opted less for the nonstop FSC flight. Older travelers or those who prized punctuality considered the indirect FSC flight to be	
				probabilistic choice model.		less appealing.	
Vink, Bazley, Kamp, & Blok.	2012	Impact of factors on passenger comfort.	10,032 Internet trip reports from travelers of 123 airlines in 2008.153 passengers at Amsterdam Airport.	Content analysis. correlation, t-tests, multiple regression to determine factors related to comfort. Survey research. T-tests to evaluate group differences.	Leg Space Personal Space Seat Width Ingress / Egress In-Flight Entertainment Noise Hand Luggage Check-In Boarding Climate Customs Hygiene of Airplane Service Total Comfort	Newer planes provide more comfort than older planes. Wide-body jets provide more comfort than narrow-body jets when flight duration is considered. Height affects comfort, as taller passengers reported lower levels of comfort. Legroom and seat were prime determinants of passenger comfort.	
Yeung, Tsang, &	2012	Passenger importance and performance of factors for LCSH and importance of factors for LCLH in Hong Kong market.	162 Hong Kong residents in 2007 who previously had flown LCSH carrier.	Survey research. Degree of importance and perceived performance of factors rated based upon last LCSH flight. Degree of importance of factors rated for potential LCLH flight. Importance– performance analysis used to plot perceived importance & performance for LCSH factors. Pair sample t-test for significant differences between LCSH and LCLH for degree of importance.	 Airfare Perception of Safety Punctuality Timetable Schedules Nonstop Flight Seat Comfort Reservation & Check-in Service Airline's Image Aircraft Type In-Flight Service Frequent Flier Program 	The top three factors for LCLH passengers were: [1] Perception of Safety, [2] Airfare, and [3] Nonstop Flight. For LCSH passengers: [1] Airfare. Six factors rated on perceived importance had a statistically significant higher mean score for LCLH travel: Perception of Safety, Nonstop Flight, Seat Comfort, Reservation & Check-In Service, In-Flight Service, and Frequent Flier Program 77% of passengers would be willing to fly an LCLH carrier, while 23% would be unwilling due to concerns primarily regarding Safety, Seat Comfort, and Preference of Service to Price.	
Jiang	2013	Service quality of LCLH carriers AirAsia X and Jetstar.	200 passengers at Melbourne Airport in 2011 who were bound for Asia.	Survey research. ANOVA used to test for significant differences by carrier and demographic characteristics of passengers.	 Assurance Airfare and Flight Patterns Reliability Responsiveness Employees Facilities Customization 	Service quality of AirAsia X and Jetstar was comparable. Assurance (Safety) was ranked as the most important factor, with Reliability and Airfare also being important. Income level, education level, or nationality did not affect passenger rating of satisfaction.	

			Sample Size,		Impact Variables or	
Author(s)	Year	Purpose	Location, When	Methodology	Factors	Key Findings
Nagar	2013	Passenger choice of LCC or FSC in India.	180 passengers at Jammu Airport in 2012.	Survey research. Cronbach's alpha used to verify items in scales represented factors.	TangiblesFlight ScheduleFlight AttendantsGround Staff	LCC was rated lower than FSC regarding Tangibles and Flight Attendants. LCC and FSC had no significant differences for
				Independent sample t- test.		Flight Schedule and Ground Staff.
Chen & Chao	2015	Impact of demographics, nationality, and carrier type on importance of factors and choice of carrier for cross-strait flights between Taiwan and China.	320 Taiwanese and Chinese passengers at Kaohsiung Airport in 2013–2014.	Survey research. EFA, ANOVA, and cluster analysis.	 Price Flight Schedule Direct vs. Connecting Punctuality Safety & Reliability Meals In-Flight Entertainment Seat Comfort Cleanliness Cabin Crew Service Problem Solving Speed of Baggage Transport Baggage Handling Reservations Frequent Flier Program Website Online Search System Image & Reputation Ground Service Promotional Strategies Flight Information Travel-Related Services 	Safety & Reliability, Punctuality, and Problem Solving Ability were considered most important. The factors that were identified included Ground Services, Convenience, In- Flight Services, Price, and Travel Availability. Passengers were grouped into one of four clusters: price- oriented, comfort-oriented, convenience-oriented, or services-oriented. Age, income, travel frequency, trip purpose, nationality, and airline chosen affected the importance of constructs for passengers.
Kuljanin & Kalić	2015	Passenger choice of LCC or FSC in Serbia.	766 passengers at Belgrade Airport in 2013.	Survey research. Two-stage cluster analysis and ANOVA.	 Ticket Price Demographic Characteristics Trip Characteristics 	Four clusters of LCC passengers formed on the basis of Decision Maker, Place of Residence, and Frequency of Flying. Emigrants constituted 36% of those flying LCC. Two clusters of FSC passengers (business vs. leisure) formed on the basis of Purpose of Travel, Frequency of Flying, Level of Education, and Ticket Price.
Min & Min	2015	Passenger evaluation of U.S. airline service quality.	171 passengers who had taken U.S. airline; domestic or international flight in 2011–2012.	Survey research. Descriptive statistics and EFA.	 Air Safety Baggage Handling Airfare On-Time Arrival / Departure Alternative Flight Arrangement for Missed Flight Connecting Flight Connecting Flight Connecting Flight Connecting Flight Complimentary Drinks / Snacks Complimentary Pillows / Blankets Frequent Flier Program Codesharing 	Passengers deemed most important: [1] Air Safety, [2] Baggage Handling, and [3] Airfare. Five factors were identified. Service Assurance and Service Recovery were important to service quality. Service Addition, Customer Loyalty, and Uninterrupted Service were not important.

			Sample Size,	Impact Variables or			
Author(s)	Year	Purpose	Location, When	Methodology	Factors	Key Findings	
Hunter & Lambert	2016	Passenger perceptions of airline safety, post 9/11.	125 passengers from the general public or from a university in the U.S. via online survey.	Survey research. EFA. One-way ANOVA.	 Airline Flight Safety (Post 9-11) Airline Employee Safety Preparedness Airline Friendliness Airline Smiling Customer Service 	Passengers' perceptions were that post 9/1 air travel is safer with new security measures in effect. Gender and age both impacted passenger perceptions of Airline Flight Safety. Men felt safer than women, and younger respondents felt safer than older respondents. Airline Friendliness resulted in a positive influence on Airline Flight Safety and Airline Employee Safety Preparedness.	
Kurtulmuşoğlu, Can, & Tolon	2016	Passenger preference of FSC (AF ₁), no- frills LCC (AF ₂), or LCC offering services and amenities a la carte (AF ₃) in the Turkish market on a domestic flight.	348 Turkish economy class passengers at Ataturk International Airport.	Survey research. Focus groups used for survey development. Stochastic multicriteria acceptability analysis – 2.	 Flight Schedule Food & Beverage Ticket Price Ticket Price In-Flight Entertainment Seat Space Air Conditioning Cleanliness of Plane Punctuality On-Time Performance Food & Beverage Variety & Quality Ease of Booking Customization Online Booking Baggage Handling Customer Complaint Handling Frequent Flier Miles Frequent Flier Miles Frequent Flier Program Facilities for Disabled, Pregnant, or Elderly Courtesy & Responsiveness Problem Solving Caring and Friendly Crews Cabin Crew Service Appearance of Flight Crew Flight Safety Website Customer Service 	Airfare was deemed most important for passenger preference of carrier. The most preferred airline was (AF ₃) the LCC offering services and amenities a la carte due to: [1] Ticket Price, [2] Punctuality, and [3] Online Booking. Food and Beverage and Frequent Flier Miles did not impact passenger preference of carrier.	
Rodríguez & O'Connell	2018	Passenger willingness to switch from charter carrier with all- inclusive holiday package to LCLH airline for long-haul travel out of Spain.	110 Air Europa charter passengers at Madrid Airport.	Survey research. One-way ANOVA with Tukey's post hoc analysis; two-way ANOVA.	Accommodation Car Rental Travel Insurance Bus/Train Tickets Airport Parking Tourism Events	60% respondents would opt for a vacation package arranged by a charter operator for long-haul rather than short-haul travel. 70% of younger respondents willing to construct their own vacation package and fly LCLH, whereas only 15% of age 56+ passengers were willing to. Families preferred all-inclusive charter offering for long-haul travel.	

			Sample Size,		Impact Variables or	
Author(s)	Year	Purpose	Location, When	Methodology	Factors	Key Findings
Dissertation	2018	Passenger choice of	1,412 passengers at	Survey Research.	 Airfare 	Findings are stated in
		LCLH or FSC in the	LAX and SEA		 Frequency 	Chapters IV and V of the
		trans-Atlantic market.	Airports in 2017.	EFA, CFA, binomial	 Departure & Arrival 	dissertation.
				logistic regression, and	Times	
				aecision tree.	 Nonstop Flights 	
					Check-In	
					 Baggage Policies & Fees 	
					Aircraft Boarding	
					Baggage Stowage Space	
					Seat Assignment	
					Policies & Fees	
					 Design & Layout of 	
					Cabin & Lavatories	
					 Cleanliness of Cabin & 	
					Lavatories	
					Legroom	
					Seat Width	
					 Seat Comfort 	
					Personal Space	
					Pilot Announcements &	
					Interactions	
					Cabin Crew Service	
					• Courtesy &	
					Responsiveness	
					Customer Service	
					Renability	
					 Functuality Sufate 	
					- Sujely	
					Reputation	
					Flight Booking	
					Food & Reverage	
					Baggage Handling	

APPENDIX B

Permission to Conduct Research

Embry-Riddle Aeronautical University Application for IRB Approval Exempt Determination

Principle Investigator: Jennifer Hunt Other Investigators: Dr. Dothang Truong Role: Student Campus: World Wide College: COA

Project Title: Low-Fare Flights Across the Atlantic: Impact of Low-Cost, Long-Haul, Trans-Atlantic Flights on Passenger Choice of Carrier

Submission Date: 6/20/2017 Determination Date: 6/30/2017

Review Board Use Only

Initial Reviewer: Dr. Mike Wiggins/M.B. McLatchey

Exempt: Yes

Approved:

Mike Wiggins	M.B. McLatchey	June 27, 2017 Expires: June 26, 2018
Pre-Reviewer Signature	Chair of the IRB Signature	Date of Approval / Expiration Date

Brief Description: The purpose of this proposal is to ascertain what affects a passenger's choice of carrier. The chosen methodology is survey research, which will be conducted at Los Angeles International Airport (LAX) and Seattle-Tacoma International Airport (SEA) with low-cost, long-haul (LCLH) air carriers and full-service carriers (FSC) passengers.

This research falls under the exempt category as per 45 CFR 46.101(b) under:

(2) Research involving **only** the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures (of adults), interview procedures (of adults) or observation of public behavior. Participant information obtained will remain anonymous or confidential.

An exempt research project does not require ongoing review by the IRB, unless the project is amended in such a way that it no longer meets the exemption criteria.



Los Angeles World Airports

Embry-Riddle Institutional Review Board Office of Research and Graduate Studies 600 South Clyde Morris Boulevard Daytona Beach, Florida 32114

LAX

Van Nuys City of Los Angele

Eric Garcetti

Board of Airport Co

Sean O. Burton President

Valeria C. Velasco Vice President

Jeffery J. Daar Gabriel L. Eshaghian Beatrice C. Hsu Thomas S. Sayles Dr. Cynthia A. Telles

Deborah Flint Chief Executive Officer

June 16, 2017

Dear Embry-Riddle IRB:

On behalf of Los Angeles World Airports (LAWA), please consider this our approval for Ms. Jennifer Hunt to perform a survey of trans-Atlantic passengers at the Tom Bradley International Terminal (TBIT) at LAX.

We understand that Ms. Hunt is a Ph.D. candidate in Aviation at Embry-Riddle Aeronautical University, and she is currently working on her dissertation titled "Low fare flights across the Atlantic: Impact of low-cost, long-haul trans-Atlantic flights on passenger choice of carrier". Ms. Hunt has indicated that she will survey approximately 400 trans-Atlantic passengers mainly in the hold rooms of the Terminal and intends to use her Airport issued Badge to access the sterile areas.

Coordination with relevant agencies, airlines and Airport Operations will be required when specific dates and times are finalized. We also ask that Ms. Hunt not only complies with all safety and security measures applicable at the Airport, but also remains respectful of ongoing airline operations and passenger convenience.

1 World Way Los Angeles California 90045-5803 Mail ED. Box 92216 Los Angeles California 90009-2216 Telephone 310 646 5252 Internet www.lawa.aero

Thank you.

Vip Indeed

Viji Prasad Director - Terminal Operations Los Angeles International Airports



P.O. Box 1209 Seattle, WA 98111-1209 Tel: 787-3000

www.portseattle.org

June 5, 2017

Embry-Riddle Institutional Review Board Office of Research and Graduate Studies 600 South Clyde Morris Blvd. Daytona Beach, FL 32114

Dear Embry-Riddle IRB,

On behalf of the Port of Seattle, I am writing to grant permission for Jennifer Hunt, a Ph.D. in Aviation candidate at Embry-Riddle Aeronautical University, to conduct her research titled "Low fare flights across the Atlantic: Impact of low-cost, long-haul trans-Atlantic flights on passenger choice of carrier" at Seattle-Tacoma International (SEA) Airport. I understand that Jennifer will be surveying approximately 400 trans-Atlantic passengers at Sea-Tac Airport in support of her dissertation research. The specific dates and times when passengers will be surveyed will be coordinated in advance with Sea-Tac.

Sincerely,

ha Ela Charles E. Goedken

Manager, Terminal Operations

Cc: Jennifer Hunt

APPENDIX C

Data Collection Devices

INFORMED CONSENT FORM

AGREEMENT TO PARTICIPATE IN: Low-Fare Flights Across the Atlantic: Impact of Low-Cost, Long-Haul, Trans-Atlantic Flights on Passenger Choice of Carrier

STUDY LEADERSHIP: Dissertation research project led by Jennifer Hunt, doctoral student, Embry-Riddle Aeronautical University.

PURPOSE: The purpose of this study is to ascertain what affects a passenger's choice of trans-Atlantic airline.

ELIGIBILITY: To be in this study, you must be 18 years or older and a passenger taking a trans-Atlantic flight in economy or premium economy class.

PARTICIPATION: During the study, you will be asked to complete a brief survey about your trans-Atlantic air travel experience including trip characteristics, traveler characteristics, satisfaction with chosen airline, and demographics. The completion of the survey will take approximately 10 minutes.

RISKS OF PARTICIPATION: The risks of participating in this study are minimal, no more than everyday life.

BENEFITS OF PARTICIPATION: I do not expect the study to benefit you personally. Your assistance in this project could benefit future trans-Atlantic passengers by enabling airlines to better understand the priorities and preferences of their travelers, and how to balance aspects such as comfort, amenities, service, and price to best satisfy the needs of their airline passengers.

COMPENSATION: For completing the in-person survey, you will be given a luggage tag as a token of appreciation. For taking part in the post-flight survey, you will be entered into a random drawing for one of several \$50 Amazon gift cards. Your chance of winning (approximately 1 in 50) will depend on the number of survey responses received. If you do not complete the study you will not be eligible for the drawing.

VOLUNTARY PARTICIPATION: Your participation in this study is completely voluntary. You may stop or withdraw from the study at any time or refuse to answer any particular question without it being held against you. Your decision whether or not to participate will have no effect on your current or future connection with anyone at Embry-Riddle Aeronautical University.

RESPONDENT PRIVACY: Your individual information will be protected in all data resulting from this study. <u>Your</u> responses to this survey will be anonymous. No personal information will be collected for the purpose of this research other than basic demographic descriptors. For the prize drawing, contact information will be requested solely to notify the winners. For those taking the online surveys, the system will not save your IP address. In order to protect the anonymity of your responses, they will be kept on a password protected computer.

CONTACT INFORMATION: If you have any questions or would like additional information about this study, please contact Jennifer Hunt, huntj3@my.erau.edu. For any concerns or questions as a participant in this research, contact Teri Gabriel, Embry-Riddle Review Board Assistant Director, at (386) 226-7179 or via email teri.gabriel@erau.edu.

CONSENT: By checking YES below, you certify that: you are 18 years or older, a trans-Atlantic passenger, understand the information on this form, that someone has answered any and all questions you may have about this survey, and you voluntarily agree to participate in the survey.

□ YES, I am a trans-Atlantic passenger who would like to participate in the survey

□ NO, I do not want to participate

LAX / SEA – TRANS-ATLANTIC PASSENGER SURVEY

PART 1: TRIP CHARACTERISTICS

1. Which airline did you fly for your trans-Atlantic flight?

- □ American Airlines
- □ British Airways
- □ Norwegian Air
- □ Virgin Atlantic
- □ WOW air
- Other Write In: _____

2. Your trans-Atlantic flight was to/from which airport in the U.S./Canada?

- □ Los Angeles (LAX)
- □ Seattle–Tacoma (SEA)
- Other Write In: _____

3. Your trans-Atlantic flight was to/from which airport in Europe?

- □ London–Gatwick (LGW)
- □ London–Heathrow (LHR)
- Keflavík (KEF)
- Other Write In: _____

4. What aircraft type did you fly on for your trans-Atlantic flight?

- □ Boeing B747
- □ Boeing B777
- □ Boeing B787
- □ Airbus A330
- □ Airbus A380
- □ I don't know
- Other Write In: _____

5. What cabin were you seated in for your trans-Atlantic flight?

- Economy Class
- Premium Economy Class
- □ Business Class (please discontinue survey)
- □ First Class (please discontinue survey)

6. How long ago has it been since you've taken your trans-Atlantic flight?

- □ Less than 2 weeks
- □ 2-4 weeks
- □ 5-8 weeks
- □ 9-12 weeks
- □ More than 12 weeks
- □ I don't remember

PART 2: TRAVELER CHARACTERISTICS

7. What was the <u>primary</u> purpose of your trans-Atlantic trip? *Please check one.*

- □ Vacation/Holiday
- □ Visiting Friends/Relatives
- □ School
- □ Training/Conference
- □ Work
- □ Medical
- Other Write In: _____

8. Are you a member of the frequent flier program of the airline or alliance partner that you flew for your trans-Atlantic flight?

- □ Yes
- □ No
- □ N/A

9. In the most recent 12 months, how many total round-trips (short-haul and long-haul) do you recall having taken on a commercial airline?

- □ 1 or less (current round-trip)
- □ 2-4
- □ 5-8
- □ 9-12
- □ 13 or more

PART 3: PASSENGER SATISFACTION WITH AIRLINE

	N/A	Very Dissatisfied	Dissatisfied	Neither Satisfied Nor Dissatisfied	Satisfied	Very Satisfied
10. Reasonableness of trans-Atlantic airfare paid.		0	2	3	4	5
11. Trans-Atlantic flight frequencies of chosen airline.		1	2	3	4	5
12. Convenience of flight departure and arrival times.		0	2	3	4	5
13. Nonstop trans-Atlantic flight availability on airline.		0	2	3	4	5
14. Check-in for trans-Atlantic flight.		0	2	3	4	5
15. Checked and carry-on baggage policies and fees.		0	2	3	4	5
16. Efficiency of aircraft boarding.		0	2	3	4	5
17. Baggage stowage space on board aircraft.		0	2	3	4	5
18. Seat assignment policies and fees.		1	2	3	4	5
19. Design and layout of aircraft cabin and lavatories.		0	2	3	4	5
20. Cleanliness of aircraft cabin and lavatories.		0	2	3	4	5
21. Legroom at seat on aircraft.		1	2	3	4	5
22. Width of seat on aircraft.		0	2	3	4	5
23. Comfort of seat on aircraft.		0	2	3	4	5
24. Personal space on board aircraft.		0	2	3	4	5
25. Pilot announcements and interactions.		0	2	3	4	5
26. On board aircraft service of cabin crew.		0	2	3	4	5
27. Courtesy and responsiveness of airline staff.		0	2	3	4	5
28. Customer service of airline staff.		0	2	3	4	5
29. Your perception of chosen airline's reliability.		0	2	3	4	5
30. Your perception of chosen airline's punctuality.		1	2	3	4	5
31. Your perception of chosen airline's safety.		0	2	3	4	5
32. Your perception of chosen airline's image.		1	2	3	4	5
33. Your perception of chosen airline's reputation.		0	2	3	4	5
34. Problem solving ability of airline staff.	N/A	1	2	3	4	5
35. Ease of flight booking.	N/A	0	2	3	4	5
36. In-flight entertainment system of aircraft.	N/A	0	2	3	4	5
37. Airline food and beverage.	N/A	0	2	3	4	5
38. Baggage handling.	N/A	0	2	3	4	5

Please rate your <u>trans-Atlantic flight</u> experience by filling in the bubble or not applicable box.

PART 4: WILLINGNESS TO SWITCH

LCLH:

Suppose a <u>full-service</u> airline offers <u>complimentary</u> checked baggage, carry-on baggage, seat assignments, flight connections, beverages, snacks, meals, headsets, pillows, blankets, and in-flight entertainment which are <u>included</u> in the trans-Atlantic <u>ticket price</u>.

39a. Would you choose to pay MORE in airfare to SWITCH to that FULL-SERVICE airline?

🗆 Yes

□ No (please skip 40a)

40a. If <u>YES</u> how much MORE money in <u>round-trip airfare</u> would you be willing to pay to SWITCH to that FULL-SERVICE airline in U.S. dollars?

41a. What are the reasons for your decision regarding whether or not you'd be willing to switch to a full-service airline?

FSC:

Suppose a <u>low-cost</u>, <u>long-haul</u> airline offers a lower airfare but charges <u>extra fees</u> for checked baggage, carry-on baggage, seat assignments, flight connections, beverages, snacks, meals, headsets, pillows, and blankets on a trans-Atlantic flight.

39b. Would you choose to pay LESS in airfare to SWITCH to that LOW-COST, LONG-HAUL airline?

□ Yes □ No (please skip 40b) 40b. If <u>YES</u> how much LESS money in <u>round-</u> <u>trip airfare</u> would you be willing to pay to SWITCH to that LOW-COST, LONG-HAUL airline in U.S. dollars?



41b. What are the reasons for your decision regarding whether or not you'd be willing to switch to a low-cost, long-haul airline?

PART 5: DEMOGRAPHICS

42. What is your gender?

- Male
- □ Female

43. What region of the world do you live in?

- □ Europe
- □ North America
- Other Write In: _____

44. What is your nationality?

□ Select checkbox

45. Which category best describes your highest level of education completed?

- □ High school diploma or less
- □ Bachelor's degree
- □ Master's or Law degree
- Doctoral degree (i.e. Ph.D., Ed.D., M.D.)

46. What is your age in years?

- □ 18-24
- □ 25-34
- □ 35-44
- □ 45-54
- □ 55-64
- □ 65 and above

47. What was your total household income for 2016 before taxes in U.S. dollars?

- □ Less than \$25,000
- □ \$25,000 to \$49,999
- □ \$50,000 to \$99,999
- □ \$100,000 to \$149,999
- □ \$150,000 to \$199,999
- □ \$200,000 or More

CONTACT INFORMATION FORM – POST-FLIGHT SURVEY

PART 1: AIRLINE

1. What airline are you flying on for your trans-Atlantic flight to Europe?

- □ American Airlines
- □ British Airways
- □ Norwegian Air
- □ Virgin Atlantic
- □ WOW air

PART 2: CONTACT INFORMATION

2. Please provide your contact information.

First Name

Email Address

PART 3: DEMOGRAPHICS

3. In the most recent 12 months, how many total round-trips (short-haul and long-haul) do you recall having taken on a commercial airline?

- □ 1 or less (current round-trip)
- □ 2-4
- □ 5-8
- □ 9-12
- □ 13 or more

4. Which category best describes your highest level of education completed?

- □ High school diploma or less
- □ Bachelor's degree
- □ Master's or Law degree
- Doctoral degree (i.e. Ph.D., Ed.D., M.D.)

5. For demographic purposes, please note your age range.

- □ 18-34
- □ 35-54
- □ 55 and above