



Ministry of Infrastructure and the
Environment

The potential of the long-haul low-cost business model and its impact on the Netherlands

KiM | Netherlands Institute for Transport Policy Analysis



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Summary

It is expected that low-cost carriers (LCCs) will operate more on long-haul. However, the long-haul low-cost (LHLC) business model will not revolutionize the air transport market as the LCCs did on short-haul. That's because many of the features which enable LCCs to compete so effectively with the incumbent full-service carriers (FSCs) are less applicable on long-haul. Cost savings are therefore smaller. Because of that only few airlines worldwide apply the LHLC business model successfully. Due to, among other things, the development of more energy efficient aircraft and new transfer options (such as self-transfer) it is expected that long-haul low-cost carriers (LHLCCs) will enter the Dutch market nonetheless, particularly at Amsterdam Airport Schiphol and (to a lesser extent) Eindhoven Airport. Its impact on the connectivity of Schiphol and the network of KLM is probably rather limited.

In this report the KiM Netherlands Institute for Transport Policy Analysis studies the potential of the LHLC business model in light of developments in the labour market, aircraft market and transfer market. KiM performed this research project because, from a policy perspective, it is important to have insights into uncertainties surrounding the potential of LHLC, and its possible consequences for the connectivity of Schiphol and the network of KLM. The report is based on a literature study complemented with several interviews with aviation experts of varying backgrounds. Furthermore, Airneth organized a seminar on the potential of LHLC.

The limitations of low-cost on long-haul

The basic strategy of low-cost carriers is simple: they eliminate all activities that are not essential to delivering the core product, which is a seat from A to B. Offering nothing else keeps costs low and satisfies the basic customer need. Customers however demand more services when flight duration increases. Moreover, other factors, such as the need to attract feeder traffic, also render the pure LCC-model inapplicable on long-haul routes.

In order to compete on long-haul with the incumbent FSCs, LCCs will have to adapt their business model. Consequently, the cost advantage over FSCs will be lower compared to short-haul flights. The total cost difference with full-service carriers (FSCs) is therefore much smaller on long-haul than on short-haul. Aviation experts question whether the cost advantage is going to be sufficient to compete effectively. Apart from that, route choice (and a focus on uncontested markets) is also deemed important for the success of long-haul low-cost carriers (LHLCCs).

Only a small number of LHLCCs currently exist worldwide. AirAsia X and Norwegian are the largest among them. These airlines show some similarities with 'typical' LCCs, such as a single aircraft type and a high-density configuration, but they have also made alterations - each in its own way - to the LCC-model. Both airlines for example facilitate transfer between their short-haul and long-haul flights. But while AirAsia X is concentrated on its large hub in Kuala Lumpur, Norwegian uses multiple mini-hubs. The observed differences between the two airlines, and the adjustments to their businesses over time, indicate that they are still going through a learning process as to how to apply the long-haul low-cost business model most profitably.

Developments in the air transport market

The following developments in the air transport market are relevant for the potential of the LHLC business model:

1. Developments in the labour market, because labour is a large cost component for airlines;
2. Developments in the aircraft market, because new aircraft types offer improved fuel efficiency and extended range;
3. Developments in the transfer market, because transfer passengers are needed to fill empty seats on most long-haul routes.

Savings on labour costs

LHLCs can gain the largest cost advantage over FSCs in labour costs. There are two uncertainties that have to be kept in mind. Firstly, low-cost carriers often pay low wages and some of their staff is employed on 'atypical' contracts, including pay-to-fly schemes. It is questionable to what extent society (in particular politics) will accept these arrangements. Secondly, the potential difference in labour costs between FSCs and LHLCs may decline because of FSCs bringing their costs down (at least in Europe), either through negotiations or replacement of staff. This leads to frequent strikes among their pilots and cabin crew.

Long-haul low-cost carriers benefit from new aircraft types

Boeing and Airbus have recently introduced new wide-body aircraft¹ (for example the B787 and A350), and not too long from now they will introduce new narrow-bodies as well (for example the B737MAX and A321XLR). Because of improved fuel efficiency and extended range, it is plausible that narrow-body aircraft will be used more frequently on long-haul. LHLCs benefit more from these developments in the aircraft market than FSCs for several reasons:

- the improvements in fuel efficiency cause a declining share of fuel in total operational costs, creating room for more competition on (other) costs;
- the narrow-body aircraft enlarge the number of route options (especially in niche markets where FSCs have no interest), owing to their extended range and relatively small size;
- narrow-body aircraft allow LCCs (with a long-haul branch) to maintain a homogeneous fleet and achieve higher aircraft utilisation, because of the substitutability of the aircraft between short- and long-haul flights;
- the deployment of new aircraft types helps to lower the LHLCs' operational costs compared to FSCs with a relatively old fleet. This is a temporary advantage.

Transfer passengers may go for long-haul low-cost

Furthermore, developments in the transfer market are relevant and advantageous for LHLCs: self-transfer and low-cost transfer. Self-transfer is a process in which the passenger arranges the entire transfer himself. Currently, self-transfer is relatively unknown, but that is changing. Search engines like Skyscanner have recently started to show self-transfer travel options in their search results. And airports such as Gatwick now offer services to simplify the transfer process for passengers, becoming so-called 'virtual hubs'.

Low-cost transfer refers to both interlining, in which case an itinerary is executed by two independent LCCs, and intralining, in which case an itinerary is executed by two LCCs from the same airline group. Because of the organisational complexities inherent to the transfer process, LCCs are currently rarely involved in interlining nor intralining, but this is changing as well. In Europe, several airlines have taken explorative steps, such as the cooperation between Ryanair and Norwegian at Gatwick. The success of these developments in the transfer market will depend on the incremental revenues and costs for the airlines involved, such as the risk of lost luggage and missed connecting flights.

¹ A wide-body is an aircraft with two aisles, whereas a narrow-body has only one aisle, and the capacity of wide-bodies is larger.

Long-haul low-cost in the Netherlands

It is expected that LHLCCs will enter the Dutch market. A low-cost carrier that is already active in long-haul markets, such as Norwegian, seems like an obvious entrant. It is also plausible that a LHLCC from another continent will add a Dutch airport to its route network, provided they have traffic rights. Conversely, it seems unlikely that Air France-KLM will establish a LHLCC in Amsterdam. Air France-KLM announced that it will start a new airline for long-haul flights, (preliminarily) named Boost, but that airline will be based at Paris Charles de Gaulle. Hence, even if Boost develops into a long-haul low-cost airline, it will not be based at Schiphol.

Limited impact on Schiphol and KLM

Compared to other Dutch airports, Amsterdam Airport Schiphol and Eindhoven Airport are best suited to accommodate LHLCCs. This is primarily due to their infrastructure, catchment area and current low-cost traffic volume. However, slot availability restricts the expansion of the long-haul low-cost segment. Schiphol has nearly reached its maximum (capped) capacity of 500,000 flight movements per year, and the reliever airport Lelystad will not be operational until 2019. Eindhoven holds a limited capacity as well. Moreover, the possibilities to transfer to other flights are scarce compared to Schiphol.

The impact of market entry by LHLCCs will mainly depend on the routes these airlines choose. If they primarily operate in uncontested (niche) markets, the consequences for Schiphol's connectivity and the KLM network are likely to be rather limited. Nonetheless, low-cost entry can disrupt a certain market, such as, for instance over the Atlantic Ocean, where the dominant airline alliances may respond to market entry by lowering fares. These airlines know that while a low-cost entrant may initiate some market creation, it can potentially take business away through hub-bypassing, for example.

Hub-bypassing might also pose a threat for Schiphol, since low-cost airlines enlarge the number of direct connections and some passengers no longer need a hub airport. Schiphol can therefore try to attract LHLCCs itself by stimulating self-transfer, for example. It may be in two minds about this however, as the growth of self-transfer could come at the expense of the KLM network, which is more important for Schiphol's connectivity.

1

Introduction

Background

Low-cost carriers (LCCs) have revolutionised the air transport market globally. They have increased the number of direct connections available at low air fares, and hence caused enormous growth in passenger numbers and aircraft movements. Although LCCs are traditionally focused on short-haul routes, there have been examples of airlines applying the low-cost business model on long-haul (>6 hours flight time), with the Icelandic carrier Loftleidir (1944-1973), and the British carrier Laker Airways (1966-1982), the first among them. Such long-haul low-cost carriers (LHLCCs) have however been far less successful than their short-haul counterparts.

In 2007, Airneth² organized a seminar on long-haul low-cost, concluding that many of the key elements of the low-cost business model are difficult to translate into long-haul operations. Moreover, a number of entry barriers exist (Airneth, 2007). Recent developments in the labour market, the aircraft market and the transfer market may however enhance the potential for LHLCCs. Labour comprises a large part of an airline's operational costs, and hence it is important to consider labour market developments. The same applies to aircraft developments, since the type of aircraft strongly affects fuel costs. New aircraft, such as the Boeing 787 Dreamliner and 737 MAX, have increased fuel efficiency. Finally, developments in the transfer market can also benefit LHLCCs. On long-haul, fewer routes exist that are large enough to sustain a direct flight solely on an origin-destination (O/D) basis. Adding transfer traffic enlarges the number of viable routes.

From a regulatory perspective, it is important to have an understanding of such developments in the aviation industry. The Netherlands has a growing air transport market. A successful expansion of the low-cost model into long-haul markets can have a major impact on (for instance) airport capacity and network quality. This is important, considering that the hub airport Amsterdam Airport Schiphol handled 450,000 aircraft movements in 2015³, while it has a regulatory cap of 500,000 per year. Further, the hub airline Air France-KLM faces competition from low-cost airlines. The scope of Air France-KLM's network is in the public interest of the Netherlands, as it provides direct connections to all over the world and attracts international businesses. It is therefore also relevant to study the potential of the long-haul low-cost business model from a Dutch perspective.

Research questions

Policy makers often take long-term decisions that are clouded with uncertainty. For air transport, long-term uncertainty exists regarding traffic growth, for instance. By exploring the potential for LHLC, this report provides insights into such uncertainty, although it does not quantify any effects on traffic volumes. The aim is to sketch a general picture of where the LHLC market is heading and how this might affect Amsterdam Airport Schiphol.

² Airneth is a network of aviation researchers.

³ Schiphol expects to handle 480,000 flights in 2016.

The report's primary research question is:

Which developments can be expected from the long-haul low-cost business model and what are the possible consequences for the hub Amsterdam Airport Schiphol?

In order to answer this question, we must first understand exactly what low-cost and long-haul means. Many definitions can be found in the literature, and they even change over time. In this report, we will therefore examine the fundamentals of LHLC:

What are the features that enable low-cost carriers to operate at low costs, and how suitable are these features for long-haul operations?

Third, we make the transition from a theoretical point of view to the real world, examining the existing long-haul low-cost carriers. Because we are interested in potential effects for Schiphol, we also consider the airport effects where possible:

Which carriers apply the LHLC business model and what do their operations look like?

Fourth, as was previously noted, earlier studies found that some key elements of the low-cost model are difficult to translate to long-haul (Airneth, 2007). However, developments in the air transport market give reason to once again study the potential for LHLC:

Which developments occur in the air transport market that might affect the potential for LHLC, and how do they affect that potential?

Finally, the report considers the likelihood that long-haul low-cost carriers will start operating in the Netherlands, looking at for instance the suitability of Dutch airports and also the possible interest of airlines. Further, we discuss the potential consequences of LHLC, including hub bypassing:

How likely is it that long-haul low-cost airlines enter the Dutch market and what are the possible consequences?

Research approach

This report is based on a literature study, complemented with a set of interviews with aviation experts of varying backgrounds, the latter of which was necessary owing to the specific nature of some of the research questions. The list of interviewees is found in the Appendix; they are referred to as 'personal communication' throughout the report. Finally, Airneth organized a second seminar on the potential for long-haul low-cost. This seminar was held in December 2015, in The Hague. The list of speakers is found in the Appendix as well.

Outline of the report

Chapter 2 begins by examining the general features of the low-cost business model. In addition to a description of the 'normal' model, it also details the so-called 'hybridisation of airlines'. A hybrid airline adopts features of distinct business models. Further, the chapter assesses the extent to which low-cost features remain applicable on long-haul routes. The chapter concludes by considering the cost advantages for low-cost carriers over full-service carriers on the long-haul, and discusses the potential profitability of LHLCs.

Chapter 3 looks at existing long-haul low-cost carriers, with a focus on the relatively successful LHLCs AirAsia X and Norwegian, describing their fleets and destinations, and assessing how their operations compare to the theoretical findings of Chapter 2.

Chapter 4 examines the developments in the air transport sector that could benefit long-haul low-cost carriers and hence demand closer examination. These are primarily developments in the labour market, the aircraft market and the transfer market. The chapter considers how new (more fuel-efficient) aircraft types can benefit low-cost carriers, for example.

Chapter 5 focuses on the situation in the Netherlands, looking at for instance the markets that can be served from Schiphol with new aircraft types. Further, the chapter analyses how suitable Dutch commercial airports are for long-haul low-cost. The chapter concludes by investigating the likelihood of LHLCCs expansion in the Netherlands.

The sixth and final chapter presents the report's main conclusions.

2

An analysis of the long-haul low-cost business model

The long-haul low-cost business model is an extension of the short-haul low-cost business model. This chapter begins by describing the 'normal' LCC-model, before proceeding to its applicability on long-haul. Further, the chapter discusses the model's viability, including the competitive responses from incumbent (full-service) airlines.

2.1 Introduction to the low-cost air transport market

Regulation and deregulation

The need for a comprehensive regulatory framework for the post-war period served as the background to the 1944 Chicago Convention, where it was proclaimed that every country should have complete and exclusive sovereignty over the airspace above its territory. It was concluded that all international scheduled flights were forbidden, unless explicitly permitted by the contracting state. Article 6 reads: "No scheduled international air service may be operated over or into the territory of a contracting state, except with the special permission or authorization of that state, and in accordance with the terms of such permission or authorisation" (ICAO, 1944).

Following the convention, a strong tendency towards protectionism emerged. In order to protect their own national aviation industries, states acted restrictively towards foreign carriers. Restrictions were placed on destinations, frequencies and fares. In the United States, however, the unprofitability of airlines induced Congress to pass in 1978 the Airline Deregulation Act, which phased out federal regulation of rates, routes and services for domestic airlines, thereby opening up the industry to market forces. This enabled new carriers to compete on fares with established legacy carriers, and, consequently, fares in real terms fell sharply, despite fuel cost increases (Burghouwt et al., 2015).

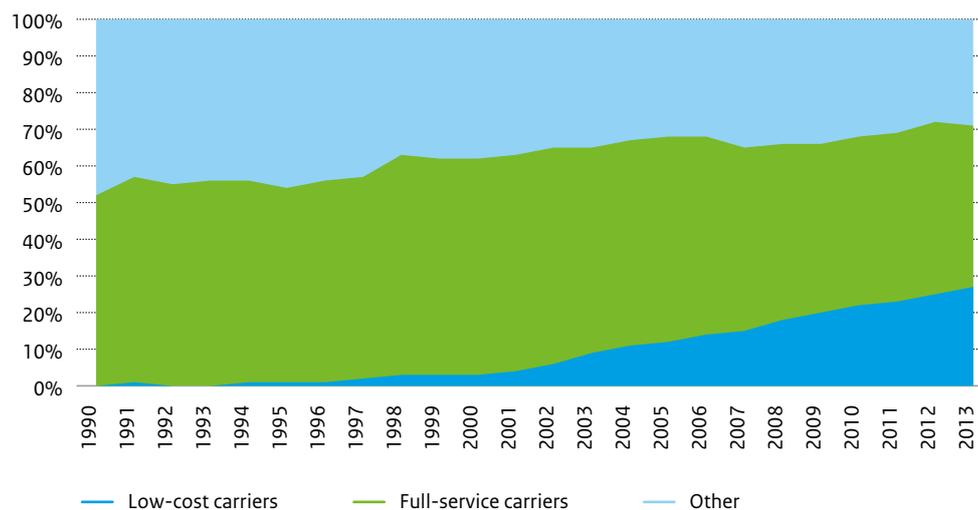
One of these new market entrants was Southwest Airlines, based in Texas, which offered generally low fares in exchange for eliminating frills, such as free drinks and baggage allowances. Some of the airline's other key attributes were point-to-point services, a single aircraft type, and high aircraft utilisation (Doganis, 2006). The *Southwest model* is deemed an early example for low-cost carriers and has since been copied by many other airlines worldwide (Francis, 2006).

Europe lagged behind the US with regard to deregulation. However, a decisive moment for the continent was when the Single European Act (SEA) came into force in 1987. Liberalisation of the European air transport market arrived in the form of three packages of regulatory measures, covering market access, air fares, and the licensing of air carriers. These packages opened up to competition all international

routes within the EU in 1992, and all domestic EU routes in 1997, when full cabotage⁴ rights were extended to every EU carrier (Burghouwt et al., 2015). European carriers could now compete on all international routes within the EU, as well as within member states.

Market deregulation has been a key driver behind the growth of European low-cost carriers. Ryanair and easyJet copied the *Southwest model* and expanded rapidly. Ryanair for instance carried 2.2 million passengers in 1995, while operating 11 aircraft; in 2005, Ryanair's passenger numbers had grown to 34.8 million and a fleet of nearly 100 aircraft in service; and finally, by 2015, Ryanair carried some 105 million passengers and operated 308 aircraft (Ryanair, n.d.), making it the largest single airline in Europe in terms of passenger numbers. Figure 1.1 shows the fraction of intra-European flights operated by a low-cost airline – 27 percent in 2013. Further, the figure illustrates the rapid growth of low-cost carriers in recent decades.

Figure 1.1 Development of the market share of low-cost carriers in Europe. Note that it concerns the share of different carrier types in the total number of intra-EU15+2 flights. Included in the other-category are airlines with a business model that is not clearly full-service or low-cost, as well as extra-EU airlines that use 5th freedom rights to carry passengers within the EU. Source: Burghouwt et al., 2015.



The low-cost business model

Francis et al. (2006) argue that it is more appropriate to talk about low-cost *business models* rather than low-cost *carriers*. Generally, airline business models are essentially devised for one purpose: to create sufficient route density or, in other words, to generate sufficient demand to cover the total cost of the flight (Krul & Burghouwt, 2013).

A business model exists independently of competitors and the current state of the market, which is where strategy comes in. The business strategy describes how the company will engage competitors, identify and segment customers, and respond to the actual market environment (Noren, 2013). Michael Porter (as cited in Krul & Burghouwt, 2013) distinguishes three generic strategies that companies can apply to gain a competitive advantage:

- product differentiation, whereby a company delivers a unique product;
- cost leadership, whereby a company delivers the cheapest product;
- market segmentation, whereby a company focuses on a specific product for a specific market.

⁴ Cabotage is the air transport of goods or passengers between two places in the same country by an airline from another country.

Krul and Burghouwt (2013) and Francis et al. (2007) argue that low-cost carriers (LCCs) apply a cost leadership strategy to generate sufficient route density, striving to create new demand and lure passengers away from other transport modes and other airlines. By offering low fares, LCCs enlarge their catchment area at the origin and destination (O/D) of the route.

Conversely, full-service carriers⁵ (FSCs) try to solve the route density problem by providing connectivity through their hub-and-spoke system, and by cooperating with strategic alliance partners in order to connect O/D-markets worldwide and hence deliver a unique product to their customers (product differentiation). For example, in and of itself, such an O/D-market cannot sustain a direct flight at an acceptable frequency, but due to the FSC's network operations, it can be connected. By doing so, FSCs 'artificially' enlarge their catchment area (Krul & Burghouwt, 2013). Due to these density advantages, full-service carriers are not incentivised to compete directly on each other's local markets (Pels, 2008).

The market segmentation strategy is generally applied by charter airlines, which focus on leisure destinations (Morell, 2008) and routinely sell holiday packages in cooperation (or even integration) with tour operators. This differs greatly from low-cost carriers, which offer an unbundled product (see Table 2.1 below). Finally, charter airlines must cope with strong seasonality.

As clearly as Porter distinguished these three strategies, so unclear have the differences between airlines become. Klopheus et al. (2012) observed the so-called 'hybridisation of airlines', in which low-cost carriers adopt features of full-service carriers and vice versa. This is a surprising development, given that carriers which only adopt some of the 'archetypical' low-cost features (discussed below) seem to have a greater propensity to fail (Francis et al., 2006). Despite the occurrence of hybrid carriers, it remains very common in the airline industry to refer to low-cost and full-service carriers. Although this terminology is adopted throughout this report, the reader is advised to use it loosely.

Features of a low-cost carrier

Doganis (2006, p.149) describes low-cost carriers as airlines that provide: "easily accessible scheduled short-haul services at very low unrestricted fares close to and often lower than those of charter airlines but with 'no frills', that is, without many of the traditional product features of either scheduled or charter services". In the literature, it is common to list a set of features of low-cost carriers to describe the reasons behind their success. Table 2.1 offers an overview of these features.

Table 2.1

Features of a low-cost carrier	Reasons why it contributes to LCC success
Point-to-point traffic	Servicing only point-to-point traffic prevents having to pay for an expensive baggage transfer system and diminishes the risk of a missed flight for passengers. Also, it gives more flexibility in scheduling compared to the hub-and-spoke-model that requires a wave structure. Shorter routes offer the greatest potential to achieve cost competitiveness over FSCs.
High density single class	LCCs usually have a high-density economy-only class. Not having a business class eliminates the need to facilitate business passengers: no airport lounges, frequent flyer programs, nor service on board. A high-density configuration simply means that more tickets can be sold.
Homogeneous fleet	A homogeneous fleet (usually the A320 or B737 family) leads to cost savings on maintenance, crew training and pilot licensing, for example.
No frills	LCCs strip frills from the core product (flying from A to B) and sells them separately (e.g. bag transfer, extra leg room, drinks). This raises ancillary revenues and lowers operational costs. The focus on short-haul services enlarges the number of unique passengers and thereby the potential for selling ancillary products. After all, a single passenger will purchase some ancillaries, such as a hotel booking, only once.

⁵ Other names for essentially the same type of carrier include legacy carrier, network carrier, and hub-and-spoke airline.

Features of a low-cost carrier	Reasons why it contributes to LCC success
High fleet utilisation and fast turnaround	The lack of frills lowers the turnaround time (e.g. less aircraft cleaning and resupplying needed). Further, LCCs make maximum use of airport opening hours. Both arguments lead to high aircraft utilisation (i.e. maximize the time in the air). This lowers the capital cost per seat mile.
No cargo	LCCs do not ship any belly cargo on short-haul. Road transport is a strong competitor on short-haul and not shipping cargo contributes to a short turnaround time.
Secondary airports	A predominant use of secondary airports prevents delays due to congestion and having to pay high airport charges.
Low labour and overhead cost	LCCs are newly established airlines and are therefore not bound to long-term labour agreements with (older) crew, unlike European legacy carriers. Overhead costs are lower due to the fact that LCC crew are brought back to base every day (hence, no overnight stays in expensive hotels).
Low distribution cost	LCCs differ from FSCs in terms of pricing schemes and distribution channels. LCCs primarily sell tickets through their own websites in order to avoid distribution costs ⁶ , and they start by selling the cheapest tickets first.
Traffic generation	Because of their low air fares, LCCs tend to divert traffic from surface modes rather than from other airlines, and generate new traffic because travel expenses decrease. This is sometimes referred to as the <i>Southwest effect</i> .
Avoid direct competition	LCCs aim to achieve a first mover advantage in markets where FSCs are unlikely to follow: this is called the <i>blue ocean strategy</i> ⁷ . Their presence can deter the competition, as it is a barrier to entry. The process of hybridisation however is certainly blurring this feature, with LCCs more frequently moving to primary hubs.

Source: Francis et al. (2007); Delicostea & Schaal (2015); Gudmundsson (2015a); JLS Consulting (2015).

Given this set of features, one can argue that low-cost carriers derive their competitive advantage from operational efficiencies in a non-complex organisation. Doganis (2006) shows that low-cost carriers can operate at around 49 percent of the cost of a full-service carrier. The main cost advantage is obtained from the relatively high seating density, the relatively low sales costs and the absence of the requirement to pay travel agents' commissions. According to Morrell (2008), as compared to full-service carriers, LCCs have cut unit costs⁸ by approximately 50 to 60 percent.

On the revenue side, De Wit & Zuidberg (2012) revealed that Allegiant, a low-cost US carrier, obtained 29.2 percent of its total revenues from ancillaries in 2009. Ryanair (22.2%) and easyJet (19.4%) also generate a significant share of their revenue through ancillaries.

2.2 Extending the low-cost business model to long-haul routes

A definition of long-haul

The previous section discussed the features that make low-cost so successful on short-haul. This section examines the extent to which these features are applicable on long-haul. However, before we come to this, it is perhaps helpful to consider a definition of long-haul.

As with low-cost, no clear cut definition of long-haul exists. Usually, a threshold between short- and long-haul is based on either flight distance or flight time. Daft and Albers (2012) regard long-haul flights as segments with a length of more than 3,000km. The Association of European Airlines (AEA) (as cited in

⁶ Ryanair sells 90% of its bookings through its own distribution channels, according to Ryanair's Chief Marketing Officer, Kenny Jacobs (as cited in "Airports can have a different conversation with Ryanair now", 2015).

⁷ The core of a blue ocean strategy is to explore new markets where competition is absent. This is in contrast with the red ocean strategy, in which competitors fight over an existing market (Kim & Mauborgne, 2005).

⁸ The measure of unit cost in aviation is the cost per available seat mile, which is the total operating costs for the airline divided by the number of seat miles produced.

Francis et al., 2007) distinguishes between short-, medium- and long-haul, with six hours flight time being the threshold to long-haul. CAPA (n.d. a) moreover defines long-haul as flights over six hours.

Francis et al. (2007) note that six hours flight time is not as random as it may seem: six hours is approximately equivalent to the maximum range of an unmodified⁹ Airbus 320 and a Boeing 737, aircraft that dominate the short- and medium-range markets. Note that this research was conducted in 2007, and that the later versions of these aircraft can now fly beyond six hours. Further, Doganis (personal communication, November 30, 2015) argues that a six-hour flight (or close to it) is the limit, as this then allows for a return flight with the same crew under the pilot flight time regulations of many jurisdictions. In others, the Civil Aviation Authority may grant special dispensation. A round trip flight means that no costs for overnight stays for pilots and cabin crew need be incurred.

Based on the above arguments, the six hours flight time threshold is also used here. Table 2.2 provides an overview: in addition to long-haul, the table distinguishes between short-, medium- and ultra long-haul, as this makes it easier to refer to certain stage lengths. From a European perspective, the Atlantic Ocean and the Sahara Desert form clear-cut, natural dividers; for example, a trip between Amsterdam and Cairo is medium-haul, whereas Amsterdam to New York is long-haul.

Table 2.2

Categorization of stage length	
Short-haul	Under 3 hours
Medium-haul	3 to 6 hours
Long-haul	6 to 12 hours
Ultra long-haul	Over 12 hours

Applicability of low-cost features on long-haul operations

In section 2.1 we have seen that flying short-haul is one of the characteristics of a low-cost carrier. One might therefore assume that long-haul low-cost is a contradiction in terms. In the literature, long-haul low-cost is *not* seen as an impossible model to operate. However, a substantial level of doubt exists about the transferability of low-cost features to long-haul. Table 2.3 discusses the applicability of the features from Table 2.1 to long-haul.

Table 2.3

Features of a low-cost carrier	Applicability to the long-haul
Point-to-point traffic	Short-haul low-cost carriers can achieve high load-factors from point-to-point traffic alone. By contrast, if LHLCCs do not seek connecting traffic, this undermines the viability and sustainability of their business model. Only a few long-haul markets are large enough for point-to-point year-round flights, but these markets are highly competitive.
High density single class	Class segmentation is very important on long-haul routes to attract high-yield passengers, as they are needed for cross-subsidisation, which makes the marginal cost of supplying economy class seats much lower. Abandoning the single class-concept leads to additional costs (frills, marketing, etc.). Further, LHLCCs cannot reduce the seat pitches in economy class as much as they can on short-haul, as passengers do not want to be cramped up in their seats for too long.

⁹ A business version of these aircraft is usually equipped with additional fuel tanks and hence capable of flying beyond six hours.

Features of a low-cost carrier	Applicability to the long-haul
Homogeneous fleet	Operating a single aircraft type leads to significant cost advantages. However, capacity issues are more prevalent on long-haul than on short-haul. Finding the right route for the aircraft is a necessity. It is therefore more difficult to maintain a uniform fleet, but not impossible.
No frills	Some of the frills remain needed based on flight duration. Even if payment is required for food and extra baggage, the costs of cleaning and baggage handling remain. The cost advantage is (much) less compared to short-haul. And from a revenue perspective, the advantage of no frills is also smaller, because there are fewer total passengers on long-haul to sell ancillaries to.
High fleet utilisation and fast turnaround	High fleet utilisation by LCCs compared to FSCs on short-haul is achieved by making maximum use of an airport's opening hours and by keeping the turnaround time as short as possible. However, full service carriers already achieve approximately 15-16 flying hours per day on long-haul, compared to 10-12 hours per day on short-haul. It is hard to squeeze out much more than that, owing to time window constraints, maintenance requirements, and punctuality risks. The turnaround time is less important, since the aircraft spends more time in the air. The difference a LHLCC can make compared to a FSC is therefore much smaller.
No cargo	FSCs handle large amounts of cargo on long-haul, which brings in additional revenue against relatively low additional costs. Handling cargo can also benefit long-haul low-cost carriers, but it is questionable whether they can mimic the FSCs' performance in this respect, as LHLCCs not only for example lack the route network, but their all-economy configurations are also likely to result in increased numbers of passenger bags, and hence a reduction in available belly capacity (and revenue from cargo).
Secondary airports	Fewer airports possess the facilities (e.g. runway and terminal capacity) to handle wide-body aircraft, and fewer are located in large enough catchment areas. Further, airport charges are less important (i.e. a smaller proportion of total operating costs) on long-haul.
Low labour and overhead cost	LCCs generally have a younger staff and are not bound to previously concluded labour agreements. However, if overnight stays are required, labour productivity declines. This is especially costly on low-frequency routes. Also, varying regulatory regimes might come into play. The simplicity of operations can largely be maintained.
Low distribution cost	Additional distribution channels (e.g. Global Distribution Systems) might be needed to attract enough passengers. Brand awareness is low outside of the airline's home continent.
Traffic generation	There are fewer possibilities to generate traffic on long-haul compared to short-haul. This is because there is no substitution from surface modes. Moreover, the air fare is a relatively small share of the total expenditures of a long holiday. Further, people may not have enough free time to travel long distances and (therefore) stay at the destined location for longer than just a weekend.
Avoid direct competition	Competitive responses are more likely on the long-haul, because those markets are more profitable for FSCs. Moreover, only a limited number of discounted seats are needed to compete with a LHLCC, and when it comes to scheduling, FSCs can easily 'sandwich' their competitor on the main hub airports. ¹⁰

Source: Francis et al. (2007); Delicostea & Schaal (2015); Gudmundsson (2015a); JLS Consulting (2015).

Assessing the applicability of each feature of LCCs reveals that they are not easily transferable to long-haul. Either LHLCCs would incur higher costs, or the potential cost difference with FSCs is small. Francis et al. (2007) note that applying a cost leadership strategy to long-haul routes is not necessarily dependent on achieving all the cost efficiencies in the same manner as short-haul low-cost carriers. The researchers found that a possible 20 percent cost advantage exists for low-cost carriers over full-service carriers on long-haul (compared to a 50-60 percent cost advantage on short-haul, as previously noted).

¹⁰ That means having a flight prior to and after the long-haul low-cost competitor.

It is questionable whether that cost difference is large enough to sustain direct competition from a full-service airline. Doganis (personal communication, November 30, 2015) noted that ‘nibbling at the edge’ of trunk routes has thus far failed the long-haul low-cost carriers.

Strategy considerations are therefore also important. Francis et al. (2007) argue that full-service carriers lose their advantage in markets where there is no business traffic. Gudmundsson (personal communication, June 23, 2016) states that LHLCCs should focus on markets where they can get a first mover advantage and where FSCs are unlikely to follow, such as markets that are unconnected to hub airports. Their presence can deter the competition, as it is a barrier to entry. Finally, expanding an LHLCC operation is very different from short-haul, requiring adjustments to the marketing, pricing and distribution strategies.

2.3 The viability of long-haul low-cost carriers

Estimating the profitability of long-haul low-cost

Marianne de Poret, Frankie O’Connell and David Warnock-Smith (2015) studied the economic viability of long-haul low-cost operations. Their study contains a financial assessment of low-cost operations on the transatlantic market, which mimics the real world as much as possible. For their analysis, they assumed a long-haul low-cost airline to be using a Boeing 787-8 Dreamliner with 294 seats¹¹, which mimics Norwegian’s configuration (see section 3.2). They choose this aircraft because a new entrant is more likely to favour it, as the aircraft is relatively small and can therefore offer a higher frequency, while also offering superior fuel efficiency compared to other smaller wide-bodies (e.g. B767 and A330).

They compared two routes: 1) Manchester – New York Newark (MAN-EWR), and 2) London Gatwick – Los Angeles (LGW-LAX). These are point-to-point connections, but 10 percent (self-) transfer is assumed. The ticket price was set 30 percent below that of a FSC, which resulted in an average roundtrip fare of US\$ 568 for MAN-EWR, and US\$ 1,036 for LGW-LAX. The load factor was 80 percent, and cargo was also included. On the cost-side, they assumed a crew-cost 20 percent below that of FSCs.

The research results revealed that a LHLCC could generate a financial return on the assessed routes, but profitability varies. On the (longer) LGW-LAX route, profits per round-trip were US\$ 20,200 compared to US\$1,400 on the MAN-EWR route. Crew, airport and fuel costs accounted for two-thirds of the total operating cost, which confirmed both the potential for savings on the crew side and the importance of fuel costs.

The authors questioned whether the shorter route is sustainable in the event of changes in demand or fuel prices. They therefore analysed two scenarios: one where the load factor drops from 80 percent to 60 percent, and one where the fuel price rises. The results revealed that the rise in fuel prices leads to losses on both routes; fuel accounts for as much as 45 percent of the total operating costs. Profits also turn into losses in the demand-scenario. In both scenarios, the longer route gives the best results.

The authors conclude that aircraft like the B787-8 certainly create opportunities for establishing new point-to-point opportunities, given its seat/range/payload capabilities. However, fluctuations in fares, load factors, fuel prices and crew costs can easily turn profits into losses. It is therefore essential for any LHLCC to expand its sources of revenue (e.g. ancillaries and cargo) and hedge against fuel price fluctuations. Moreover, crew costs must be carefully managed. Finally, De Poret et al. (2015) argue that if established European low-cost carriers extended their operations to long-haul sectors, they could benefit from their short-haul networks. Conversely, a standalone operator would have to find either routes with sufficient potential for point-to-point leisure traffic or sources of feeder traffic at both ends of the routes operated. Connecting the hubs of US and European short-haul low-cost carriers may be considered as a solution to the latter. This shows the importance of transfer traffic for long-haul low-cost carriers, and thereby the hybridisation of airlines.

¹¹ De Poret et al. (2015) also conducted analyses of other configurations of the B787, but this section is limited to the results of the 294-seater.

Competitive responses by incumbent carriers

The research results of De Poret et al. (2015) derived from a static analysis of the competitive responses of other airlines. Their demand scenario, with a lower load factor, may result from competition. According to Gudmundsson (2015b), one must acknowledge that full-service airlines remain strong competitors, operating large aircraft, distributing costs over more seats, benefitting from strong density economics, and retaining positional strength in large hubs (e.g. grandfather rights to slots).

In response to competition from a LHLC competitor, FSCs have four response options (Gudmundsson, 2015b):

- Reinforce the network model;
- Start a price war;
- Start a low-cost subsidiary;
- Do nothing.

Starting with the last point, Francis et al. (2007) argue that a competitive response is especially likely in cases of traffic diversion rather than traffic generation. Hence, when the *Southwest effect* (see section 2.2) is large, an incumbent full-service airline's optimal response might be to do nothing. After all, it is not losing traffic.

When a FSC decides to respond, Gudmundsson (2015b) argues that, based on strategy principles (see section 2.1), the FSC should focus on differentiating itself from the low-cost carrier, or, in other words, reinforcing the network model. The option of starting a price war in secondary markets will not work, because LHLCCs are leaner. To the contrary, Doganis (personal communication, 30 November, 2015) argued that incumbent carriers only need to lower their fares on a limited number of seats per flight to remain very competitive with their long-haul low-cost competitors, provided that the incumbent carrier has high frequencies on the routes involved. This may adversely impact the LHLCC's average yields and possibly also push down its load factor to unsustainable levels.

Finally, starting up (or acquiring) a low-cost subsidiary is a frequently used strategy, at least in the short-haul market. The large airline groups in Europe have all done this: IAG has Vueling, Air France-KLM has Transavia, and Lufthansa has Germanwings/Eurowings. Although these airlines are currently prospering, many low-cost subsidiaries have failed in the past; for instance, Buzz (1999-2003, KLM), GO (1997-2002, BA) and Snowflake (2002-2004, SAS) have all exited the market (Gudmundsson, 2015b). The next chapter contains examples of long-haul low-cost subsidiaries.

British Airways provided an example of the expected competitive responses: because Norwegian started operating between London Gatwick and New York JFK in 2015, BA re-opened its service between those two airports in 2016 (Cohen, 2016).

2.4 Conclusions

This chapter has shown that the basic strategy behind low-cost carriers is simple: eliminate all activities that are not essential to delivering the core product. The core product is a seat from A to B. Offering nothing else keeps costs very low and satisfies the basic customer need. However, customers demand more services when flight duration increases. Consequently, the low-cost model is unlikely to work in its purest form on long haul and therefore needs adjustments.

And it is in those adjustments to the model where the difficulties for long-haul low-cost carriers lie. We have seen that for every feature of LCCs, cost advantages are harder to obtain on long-haul: the total cost difference with full-service airlines is much smaller than on short-haul. One could question whether that gap is large enough. However, customers are increasingly searching for value for money. Further, De Poret et al. (2015) have shown that there is a potential profit, albeit in a static analysis.

Long-haul low-cost carriers may want to try to diversify revenues by shipping cargo, for instance. The main challenge for LHLCCs is to maintain the high productivity advantage that short-haul LCCs enjoy over the FSCs, and to stimulate enough demand to distribute direct operating costs over as many seats as possible. Attracting feeder traffic is essential. However, travel options for transferring passengers are scarcer at secondary airports. Moreover, with traditional interlining agreements come organisational complexities, such as baggage transfer and revenue sharing.

Facilitating transfer options also brings a low-cost airline closer to the business model of full-service airlines. Taking into account the fact that it is also harder to generate traffic on long-haul, it thus becomes more likely to expect competitive responses from incumbent carriers. Route choice, and avoidance of direct competition, may be of vital importance for LHLCCs.

Despite the operational difficulties, several airlines are attempting long-haul low-cost. The following chapter examines some (successful) examples of long-haul low-cost and assesses how these airlines cope with the challenges identified in this chapter.

3

Empirical examples of long-haul low-cost carriers

All of the (15) present-day long-haul low-cost carriers have been established since 2007. In the full-service segment, only seven carriers began operating on long-haul during the same period. Low-cost carriers are clearly exploring the boundaries of the business model. This chapter focuses on two of the largest LHLCCs, AirAsia X and Norwegian, describing their fleets and schedules, in order to determine how these airlines deal with the difficulties detailed in Chapter 2.

3.1 An overview of long-haul low-cost carriers

Laker Airways' 'SkyTrain' (1977-1982) is considered one of the first examples of a long-haul low-cost carrier, operating between London Gatwick and New York, Los Angeles and Miami. Some features this airline had in common with modern low-cost carriers were: point-to-point operations, in-flight catering available at extra cost, and high density single class seating. Passengers had to queue up at the airport to purchase a ticket, as no ticket distribution was available. The carrier's eventual failure was a result of the economic downturn in the early 1980s, strong competition from other transatlantic carriers, and the rapid depreciation of its base country's currency (Morrell, 2008).

There have been quite a few attempts to operate long-haul low-cost since Laker Airways, but none was really successful (see examples in JLS Consulting, 2015). Based on CAPA's news reports (e.g. 2015a), we identified 15 present-day LHLCCs operating scheduled international services¹². In the Asia-Pacific region, these include: AirAsia X, Thai AirAsia X, Indonesia AirAsia X, Lion Air, Jetstar, Scoot, NokScoot, Cebu Pacific and Jin Air. In Europe, they are Norwegian, Germany's Eurowings and Iceland's WOW Air. In North America, they are Air Canada Rouge and WestJet (also from Canada). Finally, the Brazilian airline, Azul, is the only long-haul low-cost airline in South America. Apart from the European carriers, only WestJet has operations into the European continent.

The previous chapter discussed the possibility for FSCs to start low-cost subsidiaries as competitive responses to low-cost market entry. When examining the above-listed carriers, several of them are in fact subsidiaries or part of a multi-brand airline group: Jetstar is owned by Qantas, Scoot by Singapore Airlines, Jin Air by Korean Air, Eurowings by Lufthansa, and Air Canada Rouge by Air Canada. Furthermore, Virgin is also said to be considering a long-haul low-cost subsidiary (Robertson, 2016).

¹² Admittedly, any list of carriers is debatable either due to definitions or market entry and exit. An example here is the exclusion of charter airlines, based on the differences in market strategy between them and low-cost airlines (see section 2.1).

The other carriers (AirAsia X, Cebu Pacific, Norwegian, WestJet, Azul and WOW) are either short-haul LCCs with a (small) long-haul operation or subsidiaries of short-haul LCCs. Other LCCs have also show interest in long-haul, such as, for instance, the US LCC JetBlue, possibly with a connection to Amsterdam (*“Amerikaanse prijsvechter JetBlue”*, 2016). The same applies to the Chinese LCC Lucky Air (Maslen, 2016). Finally, European low-cost market leader, Ryanair, has repeatedly expressed interest in starting a long-haul subsidiary, but the company is said to be waiting for an opportunity to acquire the required aircraft (CAPA, 2015b).

3.2 Norwegian

Norwegian is the third largest low-cost carrier in Europe (after Ryanair and easyJet, and ahead of Vueling and Wizz Air), with nearly 26 million passengers in 2015 (CAPA, n.d. b). As of May 2016, Norwegian operates 106 aircraft, of which 97 are Boeing 737s, and 10 are Boeing 787 Dreamliners (CAPA, n.d. c). Norwegian’s 787-8s have 291 seats (including 8 premium economy and 24 business class seats), which is a high density configuration compared to British Airways’ 214-seat 787-8s, for instance. It also transports cargo. Norwegian has a strong position in Scandinavia, but also operates throughout Europe. With the arrival of its Dreamliners, Norwegian started to operate on transatlantic and Asian routes as well.

Table 3.1 shows (the frequencies of) Norwegian’s intercontinental network in May 2016. The longest routes are to Bangkok and Los Angeles (both around 11.5 hours). The long-haul flights had a high load factor of 91 percent in the first half of 2015 (CAPA, 2015c). Further, the airline keeps its B787s flying for 17-18 hours per day, as it does not have to wait for connecting flights. This compares favourably to the 15-16 hours that its full-service rivals achieve. Given that aircraft need maintenance, and that schedules must include some margin for delays, Norwegian’s utilisation is close to the maximum¹³. Where possible, and as it does in short-haul, Norwegian flies to secondary airports with lower fees (*“Making Laker’s dream come true”*, 2014).

Table 3.1 The weekly frequency for Norwegian Air Shuttle on long-haul routes from 2nd May - 8th May 2016. Source: CAPA n.d. d.

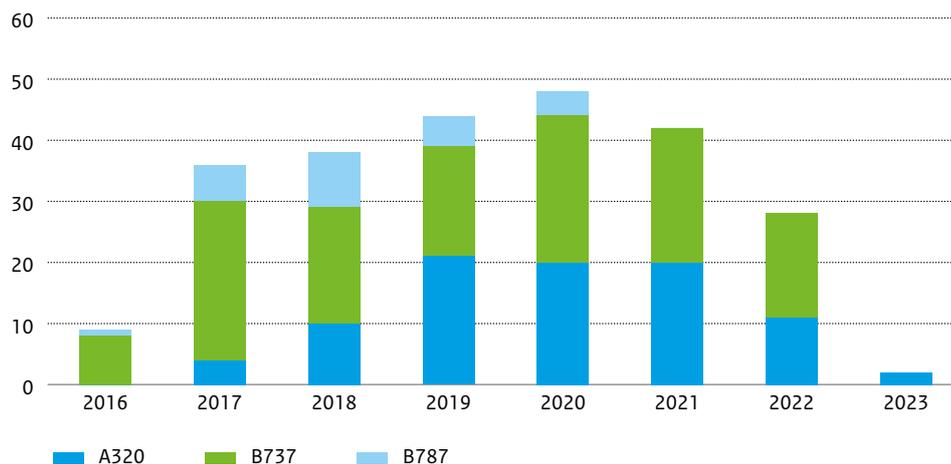
	Oslo	Copenhagen	Stockholm	London (LGW)	Total
Bangkok	2	1	1	0	4
Los Angeles	2	3	3	4	12
Las Vegas	0	1	1	0	2
Oakland	2	0	3	0	5
Fort Lauderdale/Miami	2	2	1	1	6
Orlando	1	1	0	2	4
New York (JFK)	4	4	4	7	19
Boston	1	0	0	1	2
Total	14	12	13	15	54

Norwegian has ambitious plans to expand, having placed very large orders with Boeing and Airbus. The airline will take delivery of 247 aircraft between 2016 and 2023, including for instance 108 B737-8s (MAX) and 25 B787-9s (Dreamliner) – see Figure 3.1 for Norwegian’s complete projected deliveries. It is said that Norwegian’s 2012 orders with Boeing and Airbus for 222 aircraft required an investment of 21.5 billion USD (*“Norwegian fliegt mit Boeing”*, 2015). Some critics argue that the large order numbers are

¹³ JLS Consulting (2015) reports that Norwegian (in 2014) suffered from numerous extensive flight delays and the need to rent in aircraft capacity. This can be a consequence of tight scheduling and low frequencies.

Norwegian's Achilles heel, because it primarily finances the aircraft with bonds and export credits (Cohen, 2016). Finally, Norwegian made a profit of 26 million euro in 2015¹⁴, after incurring a loss of 114 million euro in 2014 (Norwegian Air Shuttle ASA, 2016).

Figure 3.1 Projected delivery of aircraft ordered by Norwegian Group (as at August 3 2016). Source: CAPA n.d. c.



The intercontinental routes have generated a great amount of publicity for Norwegian, because the airline intends to operate these routes through its Irish subsidiary, Norwegian Air International (NAI)¹⁵. Opposing airlines, which include almost all of the largest American and European carriers, as well as labour unions, accuse Norwegian of choosing a *flag of convenience* to circumvent Norway's high labour costs¹⁶. Three former US Secretaries of Transportation support NAI however, arguing that opponents intend to block competition in transatlantic air travel (CAPA, 2016a).

Norwegian moreover argues that it must be registered in Ireland in order to make use of the European Union's air service agreements. Although Norwegian Air Shuttle is permitted to travel from anywhere in the EU/Norway to anywhere in the US under the EU-US Open Skies Agreement¹⁷, its traffic rights to other long-haul destinations, notably in Asia, are limited to those available under bilateral agreements negotiated by Norway (CAPA, 2016a). This makes it more difficult to operate intercontinentally. For the same reasons, the company founded the UK subsidiary, Norwegian Air UK, in March 2016.

The first long-haul route that NAI will operate when granted permission by the US authorities¹⁸ is from Cork (Ireland) to Boston, using a Boeing 737-800. The initial one-way fare would be just \$69.00 USD. Norwegian says it wants to test thin routes with narrow-bodied aircraft ("*Norwegian darf mit Boeing*", 2016).

¹⁴ They report in Norwegian Krone. Exchange rate used 1 NOK=0.1066 euro (conversion date: July 22, 2016).

¹⁵ However, presently (as of May 12, 2016) NAI does not operate on a single route longer than six hours. Possibly, this is because Norwegian is awaiting approval by the US Department of Transportation (DoT) of a foreign carrier permit. Norwegian applied for this permit in winter 2013, but the US DoT has postponed approval.

¹⁶ Chapter 4 deals with labor developments in more detail and shows that Norwegian currently has the second highest average employee costs among European airlines (after SAS).

¹⁷ Although Norway is not an EU member state, it is part of the European Common Aviation Area (for which it pays a fee to the EU), and ECAA-members are given access to the EU-US Open Skies Agreement.

¹⁸ As of August 2016, Norwegian has been given tentative approval by the US DoT. However, Norwegian cannot launch its services without the DoT's final approval. Because that process is so protracted, the European Commission announced that it will start an arbitration case in September (Dron, 2016).

3.3 AirAsia X

AirAsia X is the long-haul subsidiary of AirAsia and carried 3.6 million passengers in 2015. Its main base is Kuala Lumpur, Malaysia, but the airline has bases across Asia. As of May 2016, AirAsia X operates a fleet of 29 Airbus A330-300s, configured in a high-density layout of 377 seats (including 12 business class lie-flat beds). For comparison: Malaysia Airlines' A330-300s have 286 seats¹⁹, and they also transport cargo. AirAsia X has 66 A330-900NEOs and ten A350-900s on order, to be delivered between 2018 and 2027. These are moderate expansion plans compared to Norwegian's huge order numbers, but are still quite substantial.

AirAsia, the mother company of AirAsia X, is a short-haul low-cost carrier. Its strategy is to establish subsidiaries in various (Asian) countries, in order to make use of each country's bilateral air service agreements. Unlike for instance Ryanair and easyJet in Europe, AirAsia cannot operate under an Open Skies agreement in the ASEAN region. Similarly, AirAsia X has (two) subsidiaries.

Table 3.2 The weekly frequency for AirAsia X (incl. subsidiaries) on long-haul routes from 9th May - 15th May 2016. Note that the flight time from Bangkok to Osaka and Seoul is less than six hours; they're added for completeness. Source: CAPA, n.d. e.

	Kuala Lumpur	Bali	Bangkok	Total
Jeddah	5			5
Gold Coast	7			7
Sydney	7	5		12
Melbourne	14	5		12
Sapporo	5			5
Tokyo	7		14	21
Osaka	7		7	14
Seoul	14		7	21
Busan	4			4
Beijing	7			7
Total	77	10	28	108

Table 3.2 shows AirAsia X's routes longer than six hours. Jeddah²⁰, in Saudi Arabia, has the longest flight time, namely 9.5 hours. Beijing is just over 6 hours from Kuala Lumpur. The shortest route from Kuala Lumpur is still around 4.5 hours, which is medium-haul (and hence not shown in Table 3.2).

Kuala Lumpur is the hub airport in AirAsia's and AirAsia X's network, providing valuable connecting traffic. According to AirAsia's CEO, Tony Fernandes, the short-haul and long-haul have a "symbiotic relationship" (as cited in JLS Consulting, 2015). Approximately half of AirAsia X's passengers are connecting, and 75 percent of that group connected to AirAsia's short-haul network. This is a full-service product, purchased on a single ticket with automated baggage transfer (CAPA, 2014). The share of transfer passengers approaches that of a full-service airline, such as KLM, which states that about 70 percent of its passengers transfer at its hub airport Amsterdam Airport Schiphol (KLM Royal Dutch Airlines, 2015).

¹⁹ The large difference is explained by the number of business class seats and the width of the seats in economy class: Malaysia airlines has eight seats abreast, whereas AirAsia X has nine.

²⁰ The city is near Mecca, which makes it likely that large numbers of pilgrims take this flight.

2015 was a bad year for AirAsia X. Table 3.3 shows that the load factor and aircraft utilisation dropped drastically from 2014 to 2015. These are important performance indicators. Further, the table shows that their fleet grew rapidly. CAPA points to over-capacity as an explanation for AirAsia X's financial losses (not shown) (CAPA, 2015d).

Table 3.3 Performance of AirAsia X. Source: AirAsia X, 2016.

	2011	2012	2013	2014	2015
Number of passengers (millions)	2,5	2,6	3,2	4,2	3,6
Load factor (%)	80	84	82	82	75
Aircraft utilization (hours per day)	15,8	16,2	16,3	16,3	15
Number of aircraft	11	11	19	26	27
Average stage length (km)	5664	5306	5002	4927	4761

An additional finding is that the average flight distance, or stage length, decreases over the years. This is consistent with the (theoretical) argument from Chapter 2, which is that the cost difference with FSCs can be larger on shorter stages, and that shorter average stages mean more flight movements per aircraft per day and hence more passenger ancillaries.

In light of the declining stage lengths, it is worth noting what AirAsia X's planned operations looked like in 2007, with Van der Bruggen (2007) stating that Manchester, London Stansted, Prague and Moscow were scheduled. Possible explanations for AirAsia X's withdrawal from these markets are the fierce competition in the UK-Asia/Australia market and the higher costs associated with ultra long-haul flights (JLS Consulting, 2015). Meanwhile, AirAsia X has stated its intention to return to the Kuala Lumpur – London market starting in 2017 (CAPA, 2016b).

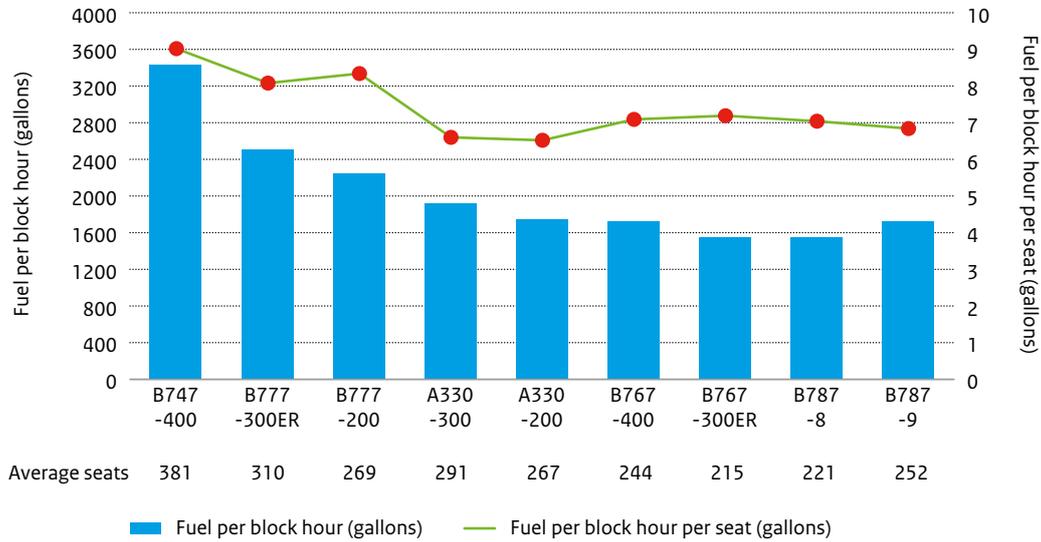
3.4 Comparison between Norwegian and AirAsia X

Thus far this chapter has described the operations of Norwegian and AirAsia X. This section examines their commonalities and differences in greater detail, firstly as related to their fleet and secondly to their network.

Fleet comparison

Both carriers operate a single aircraft type fleet on long-haul routes. Norwegian uses the B787-8 with 291 seats, while AirAsia X operates the A330-300 with 377 seats. Both aircraft have a high-density configuration and include premium seats, and both aircraft are also quite fuel efficient, see Figure 3.2.

Figure 3.2 Fuel use per block hour for several wide-body aircraft types. Note that the data are for U.S. airlines in 2015. Source: ESG Aviation Services, 2016.



The figure shows that the B787-8 uses fewer gallons of fuel per block hour than the A330-300²¹. The A330-300 is more fuel efficient when considering the gallons per block hour *per seat*, which means that when both aircraft are fully loaded, the A330-300 has a better fuel performance. However, the A330-300 requires more passengers, and this is where AirAsia X struggles: its load factors of around 80 percent (and even 75 percent in 2015) are significantly lower than Norwegian’s. This finding underlines the need to attract connecting traffic, as well as having a careful growth strategy.

Network comparison

We have seen that both carriers operate wide-body aircraft on long-haul. Bigger aircraft mean that more seats must be filled. More seats to fill means a) serving a big point-to-point market that can accommodate all those seats, b) less frequencies, or c) having a hub-and-spoke model based on connections. CAPA describes AirAsia X as essentially a network carrier on a low-cost chassis (CAPA, 2015d). Over half of AirAsia X’s passengers connect, primarily through its Kuala Lumpur hub and primarily onto short-haul routes provided by AirAsia.

For Norwegian, this is a different matter: the carrier is not as concentrated on a single airport. However, it does offer a transfer product, albeit at a fee²². Furthermore, it is exploring interlining with Ryanair. But an agreement between an (independent) LCC and Norwegian might be more complex than between two airlines from the same group. Difficulties arise with regards to the increased complexities of the operation (who is responsible for lost baggage and missed connections?), as well as the distribution of air fare revenue.

The yield²³ for transfer passengers is usually lower than the yield for O/D passengers. This forces LHLCCs relying on transfer traffic into an even stronger cost discipline, as well as a careful growth strategy, as previously mentioned. We observe AirAsia X flying double-daily on three routes, and daily services on several others, which is quite high compared to Norwegian’s operations, although perhaps this is necessary given that AirAsia X operates in more markets with direct competition (Perry & Williams,

²¹ A block hour is a measure for aircraft performance/utilisation. The number of block hours is the time between the moment an aircraft closes its doors for departure and opens its doors after landing.

²² The fee is 9.00 euro per person, per leg (Norwegian, n.d.). More on transfer developments in section 4.3.

²³ The yield is a measure of the average fare paid per kilometre, per passenger.

2015). Conversely, Norwegian, especially out of the three Scandinavian airports, does not face much direct competition on long-haul and therefore does not have to compete on frequency.

3.5 Conclusions

There are only a few long-haul low-cost carriers in the world. The airlines that do apply this business model are young and often a subsidiary of either a FSC or LCC. There is not a single airline that has a standalone LHLC operation. This is likely inherent to long-haul. Airlines need to find ways to circumvent the strict regulations pertaining to landing rights, for example, while also improving the connectivity required to attract enough transfer passengers. For full-service airline groups, a long-haul low-cost subsidiary can lead to better market coverage, tailored to the route involved, which in turn allows them to compete more effectively with other FSCs.

This chapter focused on Norwegian and AirAsia X. Both airlines have several characteristics that one would expect from a low-cost carrier, such as a single aircraft type and a high-density configuration. However, both airlines have made alterations, as compared to the typical LCC model, and this is consistent with the trend in aviation whereby the distinction between different business models becomes blurred.

Chapter 2 highlighted one of the potential flaws in the long-haul low-cost business model: that is, the lack of transfer passengers to fill the aircraft. This chapter showed that Norwegian and AirAsia X deal with this in their own ways, but as previously stated, cooperating with a short-haul partner seems essential. At present both airlines focus on transfers between airlines of the same group (intra-lining). However, the recent cooperation between Norwegian and Ryanair (inter-lining) is a very interesting development to follow, even though Ryanair only has six routes to Gatwick (compared to Norwegian's 35) (CAPA, 2016c).

The observed differences between the two airlines and their adjustments over time (e.g. AirAsia X's withdrawal from Europe) show us that carriers are still going through a learning process in terms of how to apply the long-haul low-cost business model most profitably. Imitating other airlines – as was the case with the Southwest model – may not be suitable here. However, what we do know for certain is that a low-cost carrier on the long-haul will look very different compared to the short-haul (e.g. with respect to transfer options, cargo and class segmentation). As the examples have shown, they will be hybrid airlines combining features of both LCCs and FSCs.

Finally, when examining the effects of LHLC on airports, we found that new destinations are being served and passenger transfers may increase. Additional transfer traffic may require adjustments to the design of airports. Apart from these findings, no other effects were identified.

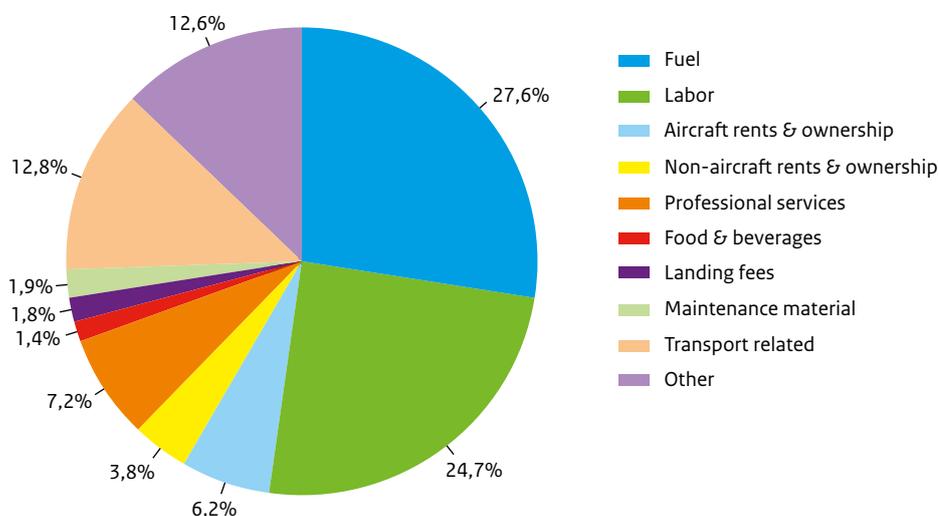
4

Developments that influence the potential for long-haul low-cost

Previous chapters revealed that operating long-haul low-cost is difficult. This chapter looks at the (exogenous) developments that might change the odds. These developments are in the labour market, the aircraft market and the transfer market.

The first two developments are relevant in that they comprise the largest operational costs for airlines, as illustrated in Figure 4.1. Fuel accounts for well over a quarter of the total costs, with labour close behind. The exact percentages differ greatly among airlines and types of business models, however. Moreover, changing fuel prices can also significantly alter the cost composition for airlines. Finally, developments in the transfer market can benefit LHLCCs, because few long-haul markets are large enough in terms of passenger numbers to provide scheduled year-round services. This chapter examines self-transfer and low-cost transfer.

Figure 4.1 United States' passenger airlines operating costs (2014). Source: Airlines for America, 2014.

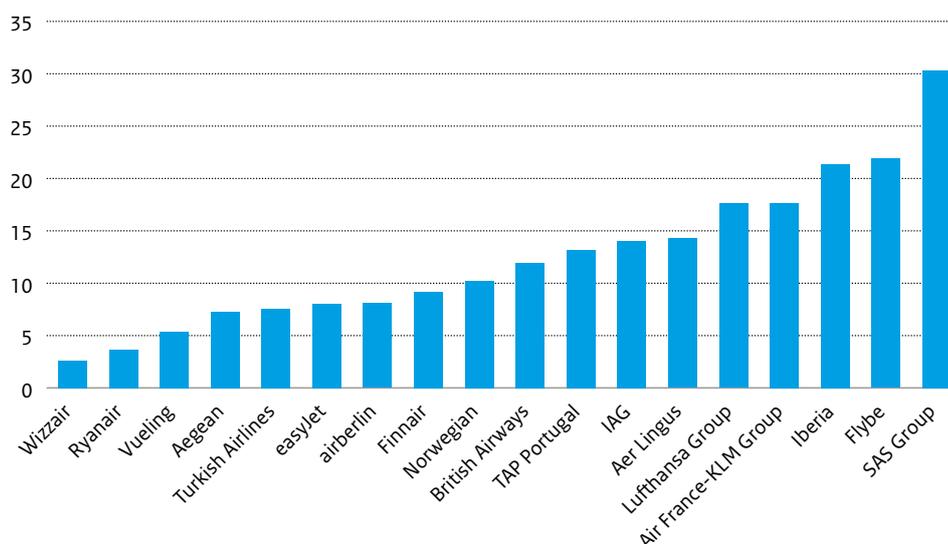


4.1 Labour market developments

The labour market from a legacy carrier perspective

Labour costs differ greatly between carriers. Francis et al. (2007) argue that the most substantial scope for cutting costs comes from labour. Figure 4.2 shows the employee cost per available tonne-kilometre (ATK) for a number of European carriers and airline groups. This metric combines employee costs per employee with ATK per employee, and basically reveals how much one employee must be paid in order to produce one unit of traffic. It is an important measure of labour productivity from a cost point of view. Low-cost carriers, such as Wizz Air, are on the low side of the graph, whereas legacy carriers²⁴, like SAS and Air France-KLM, have high employee cost per ATK.

Figure 4.2 European airlines employee cost (EUR cent) per available tonne-kilometer in 2012. Note that it concerns 2011 for TAP Portugal, and that for all others the 2012 financial year ends as follows: Ryanair, Flybe, Wizz Air to Mar-2012; easyJet to Sept-2012; SAS to Oct-2012; Lufthansa, Air France-KLM, IAG, Turkish Airlines, Norwegian, Vueling, Aer Lingus, Finnair, airberlin, Iberia, British Airways to Dec-2012. Source: CAPA, 2013.

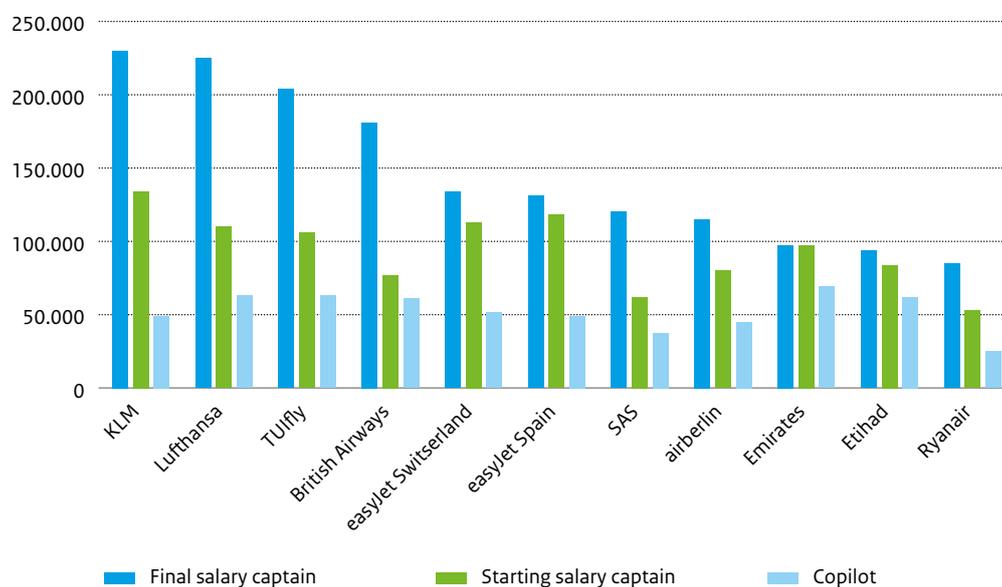


The wage differences between the two types of airlines (legacy versus LCC) stem from the regulated era, when low-cost was absent and legacy airlines monopolised the air transport market (see section 1.2). At that time trade unions were in a strong position and negotiated high employee salaries. Deregulation subsequently led to the emergence of low-cost airlines, which were not bound to such agreements. Consequently, the low-cost airlines were not only able to undercut the legacy airlines' labour costs, but they also were also able to base their crew in lower wage countries. Figure 4.3 shows the annual salaries for pilots at the various airlines: pilots for legacy airlines, such as Air France-KLM and Lufthansa, have very promising career paths²⁵.

²⁴ This section (4.1) uses the terminology legacy airline rather than full-service airline, because their actual legacy (in terms of labor agreements) is relevant here.

²⁵ A caveat here is that LCCs, such as Ryanair, only use B737s, whereas captains at Air-France-KLM and BA can progress to A380s. This blurs the wage difference. However, Emirates only operates wide-body aircraft and they too pay significantly less than the European legacy airlines.

Figure 4.3 Pilot salaries at European airlines. Source: “Das verdienen Lufthansa-Piloten”, 2014.



Today, legacy airlines face much more competition, including from LCCs that compete with their short-haul feeder network and from Gulf airlines that undercut their fares on long-haul routes. This puts enormous pressure on legacy airlines to restructure²⁶; for example, Lufthansa has started to merge the smaller European point-to-point routes of Lufthansa, Austrian, Swiss and Brussels Airlines under the brand name Eurowings (Somsen, 2015). The German newspaper Der Spiegel reported that this means a significant drop in pilots’ salaries, see Table 4.1. Naturally, pilot unions objected and went on strike (“Lufthansa schrapt honderden vluchten”, 2016). Other European countries (e.g. France and the Netherlands) also regularly experience (the threat of) pilot strikes.

Table 4.1 Comparison between the salaries of pilots at Eurowings and Lufthansa (EUR). Source: Der Spiegel as cited in “Lufthansa vs. Eurowings”, 2015.

		Lufthansa	Eurowings	Reduction
Copilot	Start salary	65,000	44,000	32%
	After 10 year	105,000	58,000	45%
Captain	Start salary	136,000	78,000	43%
	After 10 year	189,000	102,000	46%

The labour market from a low-cost carrier perspective

The world looks very different for low-cost carriers. Contrary to legacy airlines, unionization rates are low among their staff, and this means that the unions’ relative power and ability to undertake collective bargaining is low as well. Consequently, the working conditions for LCC pilots and cabin crew are quite poor compared to their colleagues at legacy airlines. Jorens et al. (2015) found all manner of atypical employment at LCCs.

²⁶ Airlines in the US invoked Chapter 11 and declared bankruptcy in order to nullify previously existing labor agreements and negotiate new, more moderate deals with unions.

There are cases in which airlines:

- employ cabin crews in multiple jurisdictions with more favourable labour standards;
- base their cabin attendants in lower wage countries but use them on flights between higher wage countries;
- hire pilots on a pay-to-fly scheme, which means that the pilot pays the airline (to accumulate flying hours);
- hire self-employed pilots who fly for various airlines as an external service provider rather than an airline employee.

These labour models have raised significant concerns over their legality, desirability and sustainability.

The trend towards atypical employment is also relevant to LHLC. Chapter 3 described how Norwegian's Irish subsidiary NAI is struggling to get a permit to operate between Cork and Boston. Their opponents in this case object to Norwegian's intention to hire Thai crew for flights between the EU and the US, as is common practice on Norwegian's flights between the EU and Bangkok, and which is permitted under Irish labour law but prohibited under Norway's. Unions, as well as US and European legacy carriers, strongly object to this atypical employment proposal. The crux of the matter is the fear that Norwegian's plan will set a precedent that other airlines can follow. To ease the pressure, Norwegian has currently renounced their initial plans and instead now pledges to only use staff from the US and Europe on transatlantic routes.

All told, by cutting labour costs, airlines (both FSCs and LCCs) have achieved substantial improvements in staff productivity. These are estimated to be 15-23 percent over the period 2000-2010 (European Commission, 2012). LCCs, however, clearly stand out in comparison to FSCs. Taking into account several measures of labour productivity, CAPA (2013) finds that Wizz Air, Ryanair and Vueling top the European rankings, while Air France-KLM, Iberia and SAS are at the lower end. Apart from having lower employee costs (see Figure 4.2), LCCs also have significantly lower numbers of employees per passenger. Moreover, increases in the number of passengers transported in each aircraft have occurred, owing to the adoption of higher seating densities and improved load factors.

The labour market from a regulatory perspective

The European Commission (2015) recently published *An Aviation Strategy for Europe*, a report that recognizes the emergence of new business and employment models, including the above-mentioned atypical forms of employment. The Commission states that it wants to ensure fair working conditions in the sector. Furthermore, when negotiating comprehensive EU-level air transport agreements with third countries, the Commission will seek to ensure that the countries' respective policies and laws support high levels of protection in the labour and social domain and that the opportunities created by an agreement do not weaken domestic labour standards and their enforcement. The Commission aims to bring the market closer to a level playing field.

In the United States, four Congressmen proposed bill HR5090 in response to Norwegian's application for a foreign carrier permit (as previously discussed). The bill directs the US Department of Transport (DoT) to require foreign carriers to meet standards agreed to in US air transport agreements before allowing them to operate in the US. It implies that Irish labour standards, which apply to Norwegian's subsidiary NAI, are insufficient and would override the US-EU Open Skies Agreement. The bill is therefore strongly opposed by both Ireland and Norwegian (Walton, 2016). EU officials moreover have repeatedly urged the DoT to grant NAI the permit and plan to launch an arbitration procedure to resolve the dispute (Fioretti, 2016).

4.2 Aircraft market developments

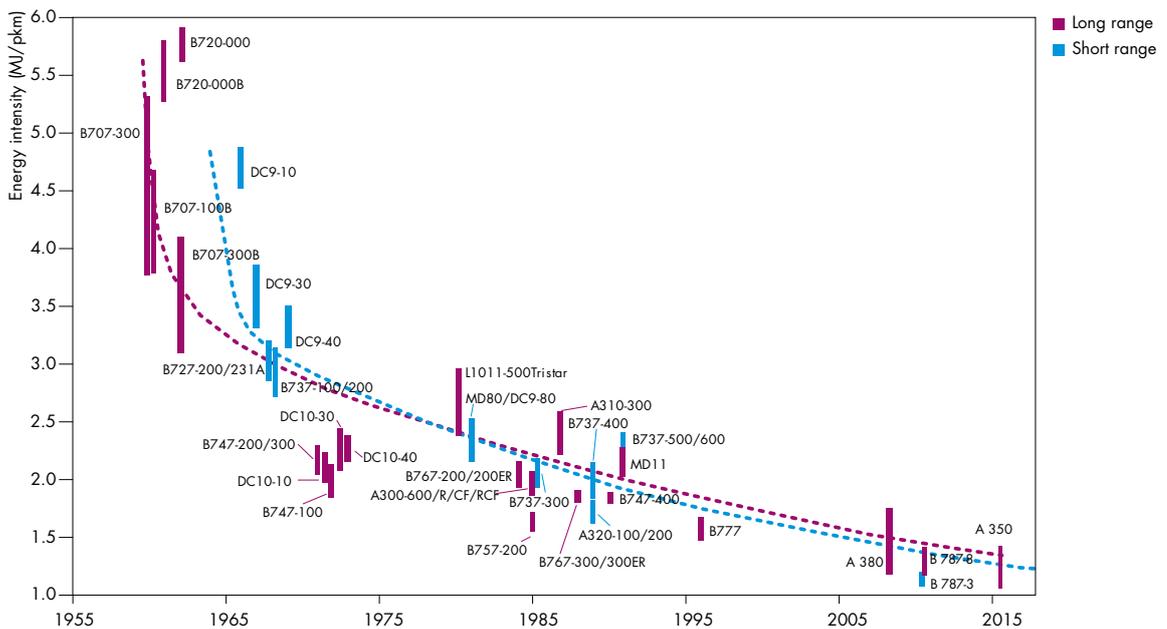
General benefits of new aircraft types to long-haul low-cost carriers

New aircraft are more energy efficient than their predecessors. Figure 4.4 shows the energy intensity (measured as *mega joules per passenger kilometre*) for numerous aircraft types.

When looking at the present day aircraft market, we see that lighter and stronger materials, as well as new engines and aerodynamic improvements, are being used on new aircraft. Examples in the wide-body segment include the medium-sized Boeing 787 and Airbus 350, which offer approximately 20-25 percent improved fuel economy compared to the older aircraft they replace (Trimble, 2014).

In the narrow-body segment, Airbus delivered the first A320 NEO in January 2016 to Lufthansa. Boeing has scheduled delivery of the first B737MAX for 2017, with this aircraft deemed a ‘game changer’ by several researchers and airlines, including De Poret et al. (2015), CTAIRA (2015) and Michael O’Leary (CAPA, 2016d). Moreover, the order book for these new aircraft runs into the thousands (“List of Boeing 737 MAX”, n.d.; “List of Airbus A320neo”, n.d.).

Figure 4.4 Energy efficiency of aircraft types. Note that the range of points for each aircraft reflects varying configurations; connected dots show estimated trends for short- and long-range aircrafts. Source: IEA (2009).



There are several reasons why new aircraft types can ‘change the game’, particularly on long-haul. The remainder of this section discusses two permanent advantages for LHLCCs (a-b), two sorts of first-mover advantages (c-d), and two advantages specifically for narrow-body aircraft (e-f).

a) *Connecting new city pairs.*

New aircraft types enable more route options for airlines. This is particularly beneficial for low-cost carriers, because they are more active in relatively small-sized markets. They cannot operate at a very high frequency and hence require many different city pairs to attain high aircraft utilisation. De Wit & Zuidberg (2012) state that LCCs tend to increase their average stage length in order to add new markets. In the case of the A320NEO, its range increases by 15 percent (Airbus, 2012), and the aircraft has a maximum flight distance of 6,850km, which brings destinations on the United States' east coast within reach from western Europe²⁷, for example

b) *More room to compete on costs.*

Fuel prices are more or less the same for every airline. Low-cost carriers therefore must find sufficient cost-savings elsewhere, in order to lower fares and tempt passengers to switch from carriers offering more comforts. Because the new aircraft types use less fuel, the total operating costs (see c.), as well as the *share* of fuel in the total operating costs, decline (assuming all else remains equal). This implies that there is more room for carriers to compete on other costs, see the numerical example in Table 4.2.

The table shows that the LCC's cost advantage increases solely due to the reduction in fuel costs (from -37.5% to -39.5%). The assumption that all else remains equal is critical, however. New aircraft require a large capital investment and hence the 'other costs' may increase.

Table 4.2 Numerical example of fuel savings on the operational cost difference between FSCs and LCCs. Source: authors.

		FSC		LCC		Difference
		Expenditures	Share	Expenditures	Share	
Old aircraft	Fuel	100	25%	100	40%	
	Other costs	300	75%	150	60%	
	Total	400		250		-37,5%
New aircraft	Fuel (-20%)	80	21%	80	35%	
	Other costs	300	79%	150	65%	
	Total	380		230		-39,5%

c) *Lower operational costs.*

Conjunct with the above-stated arguments, new aircraft types have lower operational costs. Airlines which adopt these aircraft early have a first-mover advantage, as revealed when comparing the upper left and lower right sections of Table 4.2.

d) *Increase of frequency on existing city pairs.*

Normally, larger aircraft can benefit from economies of scale (in terms of seat unit costs) over smaller aircraft on a given (long-haul) route. However, new aircraft have lower seat unit costs (see Figure 4.4, which shows that newer aircraft have better energy efficiency); hence, a smaller *new* aircraft can compete with a bigger *existing* aircraft. An airline operating these new aircraft can thereby increase its frequency, which is important given that higher frequencies are associated with disproportionately higher market shares (Belobaba et al., 2009)²⁸. This argument is particularly interesting for long-haul low-cost carriers, since smaller aircraft reduce the need to attract feeder traffic.

²⁷ Section 5.1 elaborates on the range of the A320NEO.

²⁸ This is known as the S-curve relation between frequency and market share.

e) *Homogeneous fleet.*

The new narrow-body aircraft belong to the existing A320 and B737 'family'. This means that low-cost airlines that usually fly with earlier 'family' members can fly long-haul, while maintaining a homogeneous fleet. This saves costs in maintenance, pilot licensing and training.

f) *Aircraft utilisation.*

Aircraft utilisation is an important factor for low-cost airlines to gain a cost advantage over full-service airlines (Francis et al., 2007; JLS Consulting, 2015). It can be suboptimal on long-haul due to shifting time zones and night curfews at airports. However, operating narrow-bodies allows for substitution between long-haul and short-haul. Given the flexibility of narrow-body aircraft, small gains in utilisation may be achieved through finding a better fit for the aircraft.

Narrow-bodies on long-haul operations

Some of the above arguments are only applicable when long-haul is operated with narrow-body aircraft, which is not implausible: Norwegian announced plans to use Boeing 737-8 MAX²⁹ aircraft on transatlantic services, connecting secondary European markets with the east coast of the US. Rather than flying through hub airports, passengers fly directly to their destination. Norwegian believes there is a large market for this service ("*Norwegian Air CEO on Low-Cost Trans-Atlantic Routes*", 2015; "*Norwegian Air aims to sell \$69 flights to Europe from the US by 2017*", 2015).

Currently, the B757 is the only (unadjusted) narrow-body utilised on long-haul routes. Boeing is not developing a successor, however, as the company believes the market is too small. Airbus on the other hand believes there is a market for 1,000 aircraft globally in the B757-category (Van den Berg, 2015) and is designing the A321 Long Range (LR), which will have a range of 7,400km and a capacity of 165-240 seats. Norwegian announced that it would also use the A321LR on long-haul routes (CAPA, 2016e).

4.3 Transfer market developments

Self-transfer

Traditionally, full-service (network) carriers provide a transfer product for their passengers at their hub airports, examples of which include KLM at Amsterdam Schiphol Airport, and Lufthansa at Frankfurt. The airlines provide passengers with connectivity on airport pairs that do not have a direct flight, but despite their efforts, Malighetti et al. (2008) calculated that approximately two-thirds of the fastest indirect connections between all European airport pairs are not operated by the full-service alliances. This shows that there is room for a new passenger strategy called 'self-transfer'.

In its most basic form, self-transfer is a process wherein the passenger arranges the entire transfer process himself. This means that he buys two separate tickets, regardless of the choice of airline, and picks-up and checks-in luggage at the airport where he transfers. The risk of lost luggage and the risk of a missed connection are entirely borne by the passenger. From the airline's point of view, self-transfer is a relatively easy way of attracting passengers, as it has little impact on its operations and hence keeps the costs down.

Airports, as well as service providers, such as flight search websites, are experimenting with new products for facilitating self-transfer. London Gatwick for example offers a product called 'GatwickConnects', which is free to use for all passengers who wish to transfer at that airport. The process is as follows: the passenger picks up his bag from the baggage belt and immediately checks it in at the GatwickConnects check-in desk in the baggage reclaim area, before then proceeding through immigration, entering the UK, passing through airport security and re-entering the airport terminal. The cooperation between certain Milan airports and their collective product 'ViaMilano' is another example of airports providing services for self-transferring passengers.

²⁹ Norwegian will be the launch customer for this aircraft. Delivery commences in 2017.

Both Gatwick and the Milan airports function as a ‘virtual-hub’ (Airneth, 2015). In this concept, the airports take over the transfer process, identifying attractive connecting possibilities between flights (of different carriers) through their airport and then marketing these on their own website. This virtual-hub concept is an interesting development that may increase feeder traffic for low-cost airlines without adding complexity.

An empirical example of self-transfer comes from CAPA (2014), which found that 43 percent of AirAsia X’s passengers transferred at Kuala Lumpur in 2013, of which 18 percent were self-transferring passengers. Furthermore, Suau-Sanchez et al. (2016) estimated that about 4 percent of global air travel is currently self-transferring, with the highest frequency of self-transfer occurring in markets that are approximately 2,000 kilometres apart, which places the majority in an intra-regional scope. It is too soon to conclude that self-transfer is not attractive for long-haul travel, however. Perhaps if long-haul low-cost airlines expand their network, we will see more self-transfer on long-haul routes.

Low-cost transfers

Another development is the increasing occurrence of interlining and intralining possibilities with (European) low-cost carriers. Starting with the latter, market leader Ryanair declared (in spring 2016) that it would start offering passengers the opportunity to transfer at London Stansted and Barcelona El Prat airports, two of Ryanair’s main bases, starting in the summer of 2016. Ryanair views this as an experiment; however, other LCCs, such as Norwegian and Vueling, have already passed the experimental phase. Under Ryanair’s proposed trial, transfer passengers will be able to make a single booking for the entire journey and remain airside at the connecting airport. The airline will be responsible for ensuring that any checked baggage is transferred between the two flights (CAPA, 2016c).

Ryanair and Norwegian further announced that they will cooperate at London Gatwick, where Ryanair’s short-haul passengers can connect to Norwegian’s long-haul flights to the US and Thailand. Norwegian operates five long-haul routes from Gatwick, in addition to 35 European routes. Ryanair has just six short-haul routes from Gatwick. CAPA describes this agreement as, “a figurative dipping of Ryanair’s toe in the water of interlining”, but it does provide a foundation on which Ryanair can build experience of interlining with long-haul operators. Further, a sticking point in airline negotiations is the difficulty of agreeing on responsibility for missed connections and baggage transfer. Ryanair nevertheless expects to feed long-haul airlines on a larger scale (“*Airports can have a different conversation with Ryanair now*”, 2015; CAPA, 2016c), albeit those will be primarily with full-service airlines.

It is uncertain how the market will develop with regard to self-transfer and low-cost transfer. Will LCCs primarily cooperate among themselves? Will passengers primarily transfer between short- and long-haul flights? These are questions yet unanswered by the industry or academia (Talen, 2016). Regardless of the outcome, the success of new transfer concepts will depend on the incremental revenues and costs for the airlines involved. The fact that airlines, airports and service providers are experimenting with offering new transfer products shows that they believe that transferring passengers can benefit them.

4.4 Other developments

Continued liberalisation

A continuation of global steps towards a liberalised aviation market means that opportunities for airlines to operate a low-cost business model on long-haul routes will continue to occur. From a European perspective, labour costs, social security and pensions are much lower in third countries. Negotiations are underway with countries that have competing airlines on a lower cost base. It will be difficult however for the EU to force other nations to operate according to common EU labour standards rather than their own, with the rise of the Gulf carriers serving an example.

There are however also signs of emerging nationalist movements that aim to put liberalisation on hold. However, with the effects of for instance the Gulf carriers becoming more visible, this may be to the disadvantage of legacy carriers. Further, the likely exit ('Brexit') of the UK from the EU means there is one less advocate of liberal air transport in Brussels. Moreover, a Brexit threatens future operations between the UK and other nations, such as those of Norwegian. All told, liberalisation's future is questionable: Open Skies or restrictive bilateral agreements.

Income growth

People become wealthier, which enlarges their propensity to fly. This leads to more viable point-to-point markets, and is this an ongoing process that benefits all airlines, including long-haul low-cost carriers. Love et al. (2006) studied the global demand for air transport and found that there is a strong and predictable relationship between the number of long-haul flights and the level of income per capita.

4.5 Conclusions

This chapter examined developments in the air transport industry that may influence the potential for long-haul low-cost carriers. Expenditures on labour arguably offer the largest scope for cutting costs. Unlike legacy airlines, a new low-cost entrant is unburdened by high wages for staff and can undoubtedly find crew willing to work for less, and this becomes apparent when examining the wage differences between airlines. However, LCCs, such as Ryanair and Norwegian, are pushing the limits of what is acceptable by law and social standards when hiring staff on atypical contracts, including the practice of hiring staff from lower-income countries but deploying them elsewhere in the world.

The LCC's behaviour triggers responses from legacy carriers, which pursue an active political lobby aimed at slowing the LCCs down. One example of their political support is the US Department of Transport's delay in granting a foreign carrier permit to Norwegian, as well as the proposed bill HR5090. Further, the (European) legacy carriers are trying to reduce their labour costs as well, which they need to do in order to remain competitive. This constitutes quite a struggle however, as airline staff generally are not inclined to easily relinquish their existing working conditions. Strikes – as we have seen for example at Lufthansa and Air France – are quite common and part of the negotiation process. Ultimately, labour costs for legacy airlines will go down, either through negotiations or the gradual replacement of staff. Both the political pressure and efforts by FSCs to reduce their labour costs are narrowing the (potential) wage gap between LCCs and FSCs, and hence lowering the potential for long-haul low-cost carriers.

The launch of new aircraft can stimulate enthusiasm for LHLCC. The composite materials currently being used to build new aircraft are lighter in weight, which saves fuel. This chapter described several advantages for LHLCCs, which enhance the potential for the business model. Most prominent is the fact that more niche markets become available due to the smaller aircraft size (in the case of wide-bodies) and extended range (in the case of narrow-bodies). Hence, it becomes easier to find the right fit for the aircraft, as there are more route options to choose from. This can enhance aircraft utilisation, which is very important for gaining cost advantages over full-service carriers. The combination of new aircraft types and economic growth, which generates new traffic, allows for market entry and the establishment of new routes. This process will be accelerated where liberal market conditions apply.

Finally, this chapter looked at developments in the transfer market, after Chapter 2 had found that LHLCCs cannot do without transfer passengers. However, a difficulty in that market segment is the fact that yields are generally low, and transferring passengers complicates the airport process. Consequently, a potential problem in revenue sharing arises when a short-haul LCC and a long-haul LCC would interline. Additionally, they would have to resolve issues pertaining to responsibility for lost luggage and missed flights. Intralining, as opposed to interlining, offers some clear advantages in that respect, which might explain why so many of the present day LHLCCs are part of an airline group.

Alternatively, self-transfer might be a good solution to these difficulties. Even though its current popularity is rather low (but growing), self-transfer removes the problem of revenue sharing and complications surrounding the airport processes. However, in order for self-transfer to grow, the risk of a missed flight must be eliminated. This may be done by either airports or service providers, through additional services or insurances, provided that the airline remains neutral to keep costs low and operational complexity simple. Moreover, self-transfer can be used in an informal network, rather than in formal code sharing or alliances, and hence benefit long-haul low-cost carriers while keeping their operations simple.

5

Potential effects of long-haul low-cost on the Netherlands

Thus far this report has examined the general situation regarding the long-haul low-cost business model and the developments that might enhance its potential. This chapter first looks at destinations that come into range from the Netherlands when operating new narrow-body aircraft models, such as the A320NEO. The focus then shifts to the origin-side, assessing the suitability of Dutch airports for long-haul low-cost. Finally, the chapter discusses the possible interest of airlines in starting LHLC operations to/from The Netherlands.

5.1 Possible destinations for the new narrow-body aircraft

The previous chapter argued that due to the relatively small size of the new wide-bodies (A350XWB and B787), more routes become viable. As for the new narrow-body aircraft (A320NEO and B737MAX), more routes become available due to their increased range. This section looks at the possible destinations that are in range of the A320NEO³⁰.

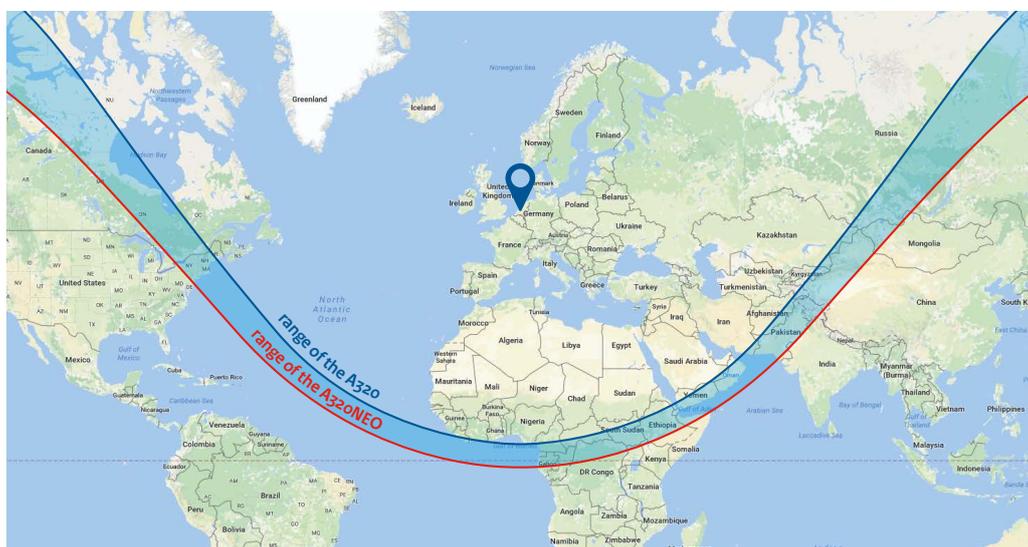
As revealed in the previous chapter, the A320NEO's range is 6,850km, compared to 6,100km for the A320. These are figures on paper, however. In the real world, flight paths between two airports never proceed in a straight line and aircraft are required to carry reserve fuel, and this must be taken into account when considering potential destinations.

Antonio Filippone developed the *equivalent all-out range* concept, which is the theoretical distance between two airports incremented with reserve fuel and diversion distance (Filippone, 2013). For a theoretical distance of 5,900km (e.g. Amsterdam – New York), the equivalent all-out range is 6,750km, which is 14 percent more than the theoretical distance (Filippone, personal communication, October 15, 2015). Applying a 14 percent adjustment to the (advertised) range of 6,850km for the NEO reveals a maximum range of 'only' 6,000km.

Making the same calculation for the current A320 reveals that the range for the NEO increases from 5,350km to 6,000km. Figure 5.1 shows which airports are situated in that specific interval, measured from Amsterdam Airport Schiphol. The picture looks more or less the same for the other Dutch airports.

³⁰ Assuming that it is being used for commercial air transport and is not equipped with additional fuel tanks. Furthermore, Airbus is working on the A321NEO LR (long-range), which is a narrow-body aircraft that can fly 7,400km, so even further than the A320NEO. However, when taking that aircraft into consideration, the analysis in this section does not change fundamentally. The A321NEO LR is expected to enter the market in 2019.

Figure 5.1 Destinations in range of Amsterdam with an A320NEO



The new narrow-bodies are certainly capable of flying transatlantic from the Netherlands; they can reach the east coast of Canada and some points in the northeast of the United States, including cities such as New York, Philadelphia, Montreal, Ottawa and Toronto. Furthermore, African countries, such as Nigeria and Ethiopia, are in range of the A320NEO, and in Asia the aircraft can reach Pakistan. However, the mere fact that you can fly there does not mean that you should: when taking other factors into account, such as population wealth, colonial history and the current trade relations between these countries and the Netherlands, there is not an obvious business case. The primary opportunities for new narrow-bodies are seemingly in the United States, and, with the Open Skies Agreement in place, it should not prove problematic to receive permits to fly there.

Next, let us consider potential destinations for the A320NEO when flying out of other airports in Europe, such as Cork, for instance, which Norwegian intends to connect to Boston using the B737MAX. Ireland lies to the west of the Netherlands and hence aircraft can fly deeper into the United States. Cities such as Washington, Detroit and Chicago are in range. Moreover, losing destinations in Asian and Africa is not a disadvantage, as previously argued. As a second example, let us consider the Spanish island of Las Palmas, lying off the coast of Morocco, from where the A320NEO is capable of covering the entirety of Europe, as well as the South American cities of Salvador (Brazil) and Paramaribo (Suriname). Based merely on its location³¹, Las Palmas can be used as a hub between the two continents, although, in actuality, that might be somewhat farfetched, since more requirements must be met before an airport can function as a hub.

5.2 Assessment of Dutch airports' suitability for long-haul low-cost

The Netherlands has five airports that are suitable for handling commercial air transport: Amsterdam (Schiphol), Eindhoven, Rotterdam, Maastricht and Groningen. A sixth airport is currently being built at Lelystad and is expected to open in 2018. Schiphol is by far the largest airport with 58.3 million passengers in 2015; the share of transfer passengers is 39.5 percent (Schiphol Group, 2016). In the same year, Eindhoven handled 4.3 million passengers, Rotterdam 1.7 million, and the others less than 200,000. This section briefly discusses the features of the various Dutch airports and assesses whether they are suitable for long-haul low-cost.

³¹ The detour on the route Amsterdam – Las Palmas – Salvador is very short compared to the direct route, for instance.

Infrastructure

First, let us look at runway length. Handling narrow-body aircraft is feasible for all the airports, but what about wide-bodies: are for example the Dutch airports suitable for handling the B787? If yes, this would enhance their chances of attracting a LHLCC. Boeing specifies that the required runway length at maximum take-off weight at sea level is 3,000 meters (Boeing, 2014). Amsterdam (3,800m for its longest runway) and Eindhoven (3,000m) fulfil this requirement. Maastricht (2,750m), Groningen (2,500m), Lelystad (2,400m) and Rotterdam (2,200m) do not. Hence, for Amsterdam and Eindhoven, no limitations exist with regard to the type of aircraft they can host. The other airports may be able to handle wide-body aircraft, but with limitations pertaining to either payload or range.

Second, the availability of slots is necessary to exploit growth opportunities in long-haul low-cost. Slot availability in general is problematic for Schiphol, Rotterdam and Eindhoven, but not for Maastricht, Groningen and Lelystad. Schiphol is legally capped at 500,000 flight movements per year. In 2016, the airport expects to handle approximately 480,000 flights. The cap might be alleviated in 2020, depending on the airlines' ability to replace old (noisy) aircraft with new (quieter) aircraft, thus lowering the net noise pollution. Lelystad and Eindhoven are positioned as reliever airports, dedicated to the low-cost and charter segments of the market.

Passenger demand

With regard to passenger demand, two features of an airport are relevant for LHLCC: transfer options and the size of the catchment area. Looking at the Dutch airports' geographical locations, the size of the catchment area is a disadvantage only for Groningen. All of the others are well-positioned near large urban areas. In fact, Eindhoven has the largest catchment area in Europe when measuring a circular distance of 150km from the airport (Thijs Boonekamp, SEO Economics, personal communication, July 5, 2016)³².

To illustrate the importance of transfer options, even for airports that have large catchment areas, we must consider how large a market should be to sustain a connection. Let us consider a daily flight with Norwegian's Boeing 787-8: if this aircraft wants to achieve an 80 percent load factor, then the market should be: $291 \text{ seats} \times 80\% \text{ LF} \times 365 \text{ days} \times 2 \text{ ways} = 170,000 \text{ passengers per year}$. Only a few routes out of Schiphol meet this number solely on an O/D-basis – see for instance Lieshout et al. (2015). One such route is Jakarta in Indonesia, which used to be a Dutch colony. The required demand of course decreases for a smaller aircraft and/or a lower frequency.

Currently, Schiphol is the only airport where airlines offer facilitated transfer, which is primarily done by KLM and its SkyTeam partners. Perhaps surprisingly, Schiphol is also deemed to be well-positioned to function as a low-cost (or virtual) hub (Maertens, 2016), because some of Europe's largest LCCs (easyJet and Transavia) have strong positions at Schiphol, which entails a large potential of viable one-stop connections. It is possible that the incidence of self-transfer will grow, especially when the risk of a missed connection is eradicated, and this will benefit the long-haul low-cost carriers. Self-transfer at the other Dutch airports is less likely, however, owing to their small traffic volumes and hence fewer flights available for transferring to.

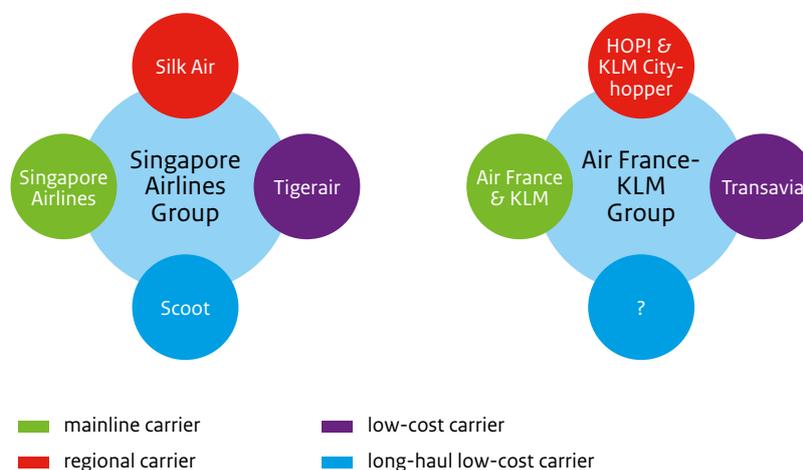
³² SEO Economics developed the *SEO Airport Catchment Area Database*, which is not publicly available.

5.3 Assessment of airlines' possible interest in long-haul low-cost to/from the Netherlands

Subsidiaries of full-service airlines

Section 3.1 listed all present day long-haul low-cost carriers and found that none were standalone operations, and that several are subsidiaries in a multi-brand airline group: Jetstar is owned by Qantas, Jin Air by Korean Air, Eurowings by Lufthansa, and Air Canada Rouge by Air Canada. Figure 5.2 shows the composition of the Singapore Airlines Group, with its mainline (or flag carrier) Singapore Airlines, its regional carrier Silk Air, its low-cost carrier Tigerair, and its long-haul low-cost carrier Scoot. Air France-KLM and Virgin are also said to be considering a long-haul low-cost subsidiary.

Figure 5.2 Schematic composition of the Singapore Airlines Group and the Air France-KLM Group. Source: authors.



The possibility that Air France-KLM starts a LHLC subsidiary is (of course) very relevant here. KLM is by far the largest airline active in the Netherlands, with 28.5 million passengers in 2015 (KLM, 2016). KLM serves over 60 long-haul destinations out of Schiphol. For the regional market, the airline operates KLM Cityhopper, and for the low-cost market it has Transavia (see Figure 5.2), with the latter operating a fleet of B737s that are unsuitable for long-haul flights.

The question mark in Figure 5.2 shows that the Air France-KLM Group does not yet have a long-haul low-cost airline³³. Should it establish one, it would follow the example of Singapore Airlines (with Scoot) and Lufthansa (with Eurowings). Section 4.1 showed that Eurowings pilots earn significantly less than Lufthansa pilots. Arguably, Eurowings was established to cut labour costs at the mainline, and to raise Lufthansa's overall competitiveness, which is different from entering the market because of a business opportunity that exists in an underserved market.

In the case of Air France-KLM, the decision to start a long-haul low-cost carrier can be difficult when looking at the internal relations between the board, on the one hand, and employees and unions on the other. The process of restructuring the airline group has led to lengthy negotiations and numerous strikes. Starting up a LHLC subsidiary could lead to suspicions that its aim is to cut labour costs, which makes it even harder to establish an airline that already faces the difficulties inherent to the long-haul low-cost business model.

³³ Air France-KLM (2016) announced it will start a new airline for long-haul flights, under the (preliminary) name Boost. It was not presented as a long-haul low-cost airline, although set on a lower cost basis. Boost's home base will be Paris Charles de Gaulle, and it will maintain the service level of Air France.

Air France-KLM is moreover investing in expanding its short-haul subsidiary Transavia, as well as fleet renewal of both its wide-body and narrow-body aircraft. These investments require a lot of cash. Also, a new airline depletes the financial resources of its owner quite rapidly in the start-up phase of its existence (e.g. acquiring aircraft, creating brand awareness, finding profitable destinations and so on), especially on long-haul. Rather than setting up a new subsidiary, Air France-KLM may find better use of its scarce resources elsewhere in its organisation.

Market entry may also occur through a subsidiary of a non-European FSC; however, Amsterdam is routinely served by mainline carriers, not subsidiaries. When looking at the full-service product that airlines served to deliver, long-haul no-frills flights to Amsterdam seem rather inappropriate, as it would also pose additional competition to its mainline carrier if that carrier is already active in the Dutch market.

Subsidiaries of low-cost airlines

Section 3.1 also named the LHLCCs that are either a subsidiary of a short-haul low-cost carrier (AirAsia X) or simply a low-cost carrier with a (relatively small) long-haul operation (Cebu Pacific, Norwegian, WestJet, Azul and WOW). Other LCCs have also shown interest in long-haul; for example, Ryanair, the US LCC JetBlue, and the Chinese LCC Lucky Air. Will these airlines open up routes to the Netherlands?

First, let us consider the likelihood that Norwegian opens long-haul routes from the Netherlands. Presently, Norwegian operates one daily flight to its three main Scandinavian bases (Copenhagen, Oslo, Stockholm) out of Amsterdam. It has no presence at the other Dutch airports. From the looks of it, Norwegian uses Amsterdam to feed the long-haul flights from Scandinavia, not the other way around. However, in 2015, a Dutch newspaper reported that Norwegian is interested in opening up a base in Amsterdam for long-haul operations to the US and the Caribbean (Eldering, 2015). Norwegian says it is studying several airports in search for more European long-haul bases starting in 2017. It indeed makes sense to consider the option of basing aircraft and crew in Amsterdam, as the large numbers of low-cost passengers from other airlines present an opportunity to benefit from self-transfer, and the size of the catchment area is large. Furthermore, Norwegian has placed a large order for the B737MAX, and given that certain destinations in the US are within that aircrafts' reach, the MAX could easily be used interchangeably for short European flights and long transatlantic flights. Basing aircraft and crew in Eindhoven makes less sense for Norwegian, as the airline has no presence there and the airport does not offer many opportunities for self-transfer.

Let us consider the possibility that Amsterdam or Eindhoven is a destination for any non-European LHLCC. The same arguments used for Norwegian apply: there are many potential passengers, especially at Schiphol. Route choice is very important though, as KLM can choose to defend its position in Amsterdam by (for example) lowering prices. Avoidance of direct competition from the hub carrier is advisable, as was previously discussed. So far, WestJet is the only non-European LHLCC with flights into Europe (namely to Gatwick); it is a code share-partner of Air France and KLM in Canada, and it does not have code-shares with British Airways and Lufthansa (WestJet, n.d.). Because of that partnership, WestJet may find opening up a direct connection to Schiphol inopportune.

Third, what about Europe's largest LCCs, easyJet and Ryanair: will they be interested in long-haul low-cost from the Netherlands? easyJet was the second largest carrier at Schiphol by passenger numbers in 2015, behind KLM. Ryanair is the largest carrier at Eindhoven. EasyJet and Ryanair are not active in long-haul markets, although there have been rumours about them changing their businesses. Ryanair for instance is said to be waiting for the end of the business cycle of the Boeing 777 before acquiring them for a long-haul expansion (JLS Consulting, 2015). One could doubt however that they would be willing to change their highly successful short- to medium-haul strategy, especially when Europe still has a growing (short-haul) LCC market.

Tour operators

Finally, let us consider the German tour operator TUIfly, which acquired a Dutch tour operator several years ago and hence also has a strong market position in the Netherlands. TUIfly operates B787s (a suitable aircraft for long-haul) and has experience in the long-haul market. However, as we have seen in section 2.1, tour operators apply a very different strategy than low-cost carriers; their focus is on the leisure segment and package deals. TUIfly would have to undergo some re-branding and develop new (transfer) products before being eligible for LHLC. Moreover, Chapter 4 showed that TUIfly's pilot salaries are relatively high compared to low-cost carriers.

5.4 Conclusions

Based on the assessment of the suitability of the Dutch airports and the potential interest of airlines to open up routes to/from the Netherlands, market entry by a long-haul low-cost carrier can be expected. Compared to the other Dutch airports, Amsterdam Airport Schiphol and Eindhoven Airport were found to be best suited, primarily due to their physical infrastructure and high passenger numbers. However, slot availability restricts the options for airlines, particularly when it comes to building a feeder network.

This chapter assessed the potential interest of Air France-KLM to start a LHLC subsidiary. It was found that the airline is going through a restructuring process and may find better use for its funds than starting up a new airline. However, should Air France-KLM decide to start a LHLC subsidiary, it may face opposition from labour unions that suspect wage cuts are the primary motivation for long-haul low-cost instead of market opportunities. Nonetheless, to not 'fall behind' Lufthansa could be a reason to start a long-haul low-cost carrier. It seems unlikely that a non-European LHLC, which has a full-service mother company, would enter the Dutch market.

Conversely, carriers such as Norwegian seem better equipped to, and have already shown interest in, operating LHLC from Schiphol; Norwegian's huge aircraft orders indicate expansion, too. Further, overseas LHLC (such as Lucky Air) might also have interest in Amsterdam: these carriers can benefit from the LCC presence in Amsterdam and Eindhoven, as well as from their large catchment areas.

The chapter also found that with wide-body aircraft only a handful of long-haul routes can be frequently served solely on an O/D basis (e.g. former Dutch colonies), and KLM is of course already present in these markets. A proven strategy for low-cost carriers is to avoid direct competition; hence, a long-haul low-cost carrier will need to find niche markets and attract transfer traffic. This seems plausible to do from Amsterdam, by means of interlining and/or self-transfer. Should it ultimately prove impossible to attract sufficient numbers of transfer traffic, LHLC can alternatively lower their frequency. Taking Eindhoven as an example, there are fewer possibilities for attracting transfer traffic, hence, a LHLC would anyway have to fly on a low frequency basis from Eindhoven.

An alternative method for lowering capacity is to use narrow-body aircraft. The A320NEO and B737MAX can reach the east coasts of Canada and the United States. The transatlantic market is a huge market and it seems plausible that low-cost carriers could find niche markets in North America. Moreover, other destinations for the new narrow-body aircraft could be found in Africa and Asia. The demand on these routes is relatively low, however, and bilateral service agreements are relatively restrictive compared to the Open Skies agreements between the EU and the US and Canada.

Next, let us consider the possible consequences for Amsterdam Airport Schiphol and KLM. Schiphol may be in two minds about whether or not to stimulate self-transfer. On the one hand, the airport may want to exploit the market opportunities that self-transfer offers for (long-haul) low-cost carriers, while, on the other, growth of self-transfer may come at the expense of the KLM network, which is also important for the connectivity of Schiphol. In addition, Schiphol has almost reached its maximum capacity, and this hampers expansion.

A threat for Schiphol and KLM is called ‘hub-bypassing’, whereby passengers fly directly to their destinations, rather than via a hub. This can occur when a LHLCC operates elsewhere in Europe for destinations that are also being served by KLM from Schiphol. In this case, both KLM and Schiphol can lose passengers. A LHLCC operation lowers the threshold for direct connections, which results in hub-bypassing. Let us now assume that the LHLCC operates from Schiphol, instead. The hub that is being ‘bypassed’ is the one on the destination side where KLM delivers passengers to its partner airlines. Those airlines would normally operate the second (or third) leg of the passenger’s journey, but now, with the LHLCC flying directly to the destination, the passenger no longer needs to transfer at that overseas hub. Note that in this case Schiphol does not lose traffic, as the passenger simply flies with another carrier.

The severity of hub-bypassing depends on the routes being chosen by the low-cost carriers. If they primarily operate in niche markets, the consequences for Schiphol and KLM are likely rather limited. Furthermore, in a growing world-wide air transport market, it is normal to see indirectly served city pairs grow until a direct route becomes sustainable. A low-cost carrier may be the first airline to enter the market, which enhances direct connectivity. However, concurrently, new city pairs emerge that can be served indirectly. Because of this ongoing process, there will always be a role for a hub-and-spoke airline like Air France-KLM.

6

Conclusions

Which developments can be expected from the long-haul low-cost business model and what are the possible consequences for the hub Amsterdam Airport Schiphol? That is the central question of this report. The overall conclusion is that it is probable to see long-haul low-cost (LHLC) more widely applied in the (near) future. However, it is unlikely that this will revolutionise the aviation industry in the same manner as its short-haul counterpart, with the reason being that when all the potential cost savings we know of from the short-haul model are applied to the long-haul, they add up to a smaller difference with the full-service carriers (FSCs). Fortunately for long-haul low-cost carriers (LHLCCs), the development of more fuel efficient aircraft and increasing transfer options benefit their business model relatively more than they benefit incumbent FSCs. Furthermore, new entrants have an advantage in labour costs over incumbent airlines. However, regulatory uncertainty in the labour market, and wage cuts at full-service airlines, work against the LHLCCs' chances of success. In the case of the Netherlands, it is plausible to expect market entry. Amsterdam Airport Schiphol and Eindhoven Airport were found to be best suited compared to the other Dutch airports, with Schiphol benefitting from an already large LCC market. The impact of market entry by a long-haul low-cost carrier depends on the routes it chooses; if it mainly operates in niche markets, in order to avoid direct competition with KLM, then the consequences for the connectivity of Schiphol and the KLM network are likely rather limited. KLM may nonetheless decide to react competitively (e.g. by lowering prices). The remainder of this chapter elaborates on these main conclusions.

Theoretical findings

When looking at the fundamentals of the (short-haul) low-cost model, we found that a set of features contributes to the success of that business model. However, these features are not fully applicable to the long-haul. To give a few examples, long-haul low-cost carriers:

- must have connecting traffic, because only a few long-haul markets are large enough to be served solely with O/D-traffic;
- can sell fewer ancillaries, because the total number of passengers per aircraft per day is lower;
- generate less traffic, because there is no substitution from ground transport;
- incur costs for overnight stays for their crew, because they cannot return to their home base;
- need additional ticket distribution channels, because brand awareness is low outside of their home market.

Moreover, rival full-service carriers achieve high aircraft utilisation on long-haul and can compete relatively easily on fares and frequencies.

Several analysts (e.g. Gudmundsson, 2015b) argue that airlines must find innovative solutions for some of the business model's major drawbacks, before LHLC can become a sustainable model. Moreover, airlines must maintain high productivity and operational simplicity while doing so. The virtual-hub concept, in which passengers arrange their own transfer, is one such innovation; it is used to increase feeder traffic without adding operational complexity for airlines.

The conclusion is that long-haul low-cost is about cutting costs wherever possible. Despite all of the drawbacks, it is theoretically possible to achieve a cost advantage per seat mile of approximately 20 to 30 percent over FSCs, and make a profit, as was shown in section 2.3 (albeit in a static analysis). The question is whether that potential difference is large enough. That said, route choice may be even

more important for a specific airline than the actual cost difference with its full-service rival. A so-called *blue ocean strategy*, with a focus on uncontested markets and preferably a relatively low share of business passengers/high share of leisure passengers, is more likely to become successful.

Empirical findings

When looking at the current air transport markets, only a few long-haul low-cost carriers exist, as can be expected based on the above-stated theoretical arguments. Studying two of them (Norwegian and AirAsia X) in more detail revealed that their approach to the business model differed in several ways, including the size of their respective aircraft and the weekly frequencies they apply.

A similarity between AirAsia X and Norwegian is that they operate a single aircraft type on long-haul, and have included a premium segment. Further, they both accommodate transfer, which is particularly true for AirAsia X, as it operates a hub-and-spoke model and facilitates intralining with its mother company at Kuala Lumpur. Transfer traffic is lower yielding traffic, however. It remains to be seen how profitable AirAsia X and Norwegian can be, especially during economic downturns when demand is low.

LHLCCs are inevitably hybrid carriers; for example, they must have a small premium cabin and engage in networking to operate effectively. These features are similar to, but not the same as full-service airlines. The empirical findings show that LHLCCs are still in search of the best practice, examples of which are AirAsia X's decreasing average stage length, and Norwegian's plan to operate between Cork and Boston with narrow-body aircraft. The process of trial-and-error is likely to continue, given some of the developments described in this report.

Developments in the air transport market

This report focused on developments in the labour market, aircraft market and transfer market. All told, these developments are beneficial for long-haul low-cost carriers.

Analysts argue that LHLCCs can gain the largest cost advantage over FSCs in labour costs. However, there are two uncertainties that must be taken into account. First is the ability of low-cost airlines to continue to lower the minimum standards: some of their staff are employed based on 'atypical' contracts to save costs, and it is uncertain to what extent society (in particular politics) is willing to accept this. Second, full-service airlines are also trying to reduce their labour costs, which leads to frequent strikes among pilots and cabin crew. Ultimately, their labour costs will have to go down, either through negotiations or replacement of staff, and this will decrease the gap in labour costs between LHLCCs and FSCs.

In the aircraft market, Boeing and Airbus have recently introduced new aircraft in both the wide-body and narrow-body segments. Long-haul low-cost carriers can benefit from new aircraft types in several ways:

- they enable more route options (especially in niche markets where FSCs have no interest), because of their extended range and relatively small size;
- their improved fuel efficiency lowers the share of fuel in total operating expenditures, creating room for more competition on costs;
- they allow carriers to maintain a homogeneous fleet (with regard to narrow-bodies³⁴) and achieve higher aircraft utilization, because of the substitutability of the aircraft between short- and long-haul flights;
- they lower long-haul low-cost carriers' operational costs, because of a first mover advantage over legacy carriers with relatively old fleets.

In addition, two interesting developments occur in the transfer market: self-transfer and low-cost transfer. Self-transfer is a process in which the passenger arranges the entire transfer himself, which means for instance purchasing two separate tickets and picking up checked luggage at the intermediate airport. Currently, self-transfer is relatively unknown, but this is changing. Search engines like Skyscanner

³⁴ It is plausible that we will see more narrow-bodies on (short) long-haul stages, as Norwegian plans to use the B737MAX and A321NEO long-range on transatlantic routes.

have started to show self-transfer options in their search results, and airports such as Gatwick offer products that simplify the passenger's entire transfer process by becoming 'virtual hubs'. Important in this respect are the risks of missing the connecting flight and losing checked baggage. These risks must be eliminated before self-transfer can become a viable option for the more risk-averse passengers. Finally, low-cost transfer refers to either interlining between two independent low-cost carriers or intralining within the same LCC. In Europe, several airlines have taken explorative steps in this direction. Both self-transfer and low-cost transfer can benefit LHLCCs.

Impact on the Netherlands

Market entry by a long-haul low-cost carrier can be expected, based on the increased potential of the business model generally and the large current aviation market in the Netherlands specifically. The most probable type of airline to start up LHLC routes to/from the Netherlands is a low-cost carrier with a long-haul branch, such as Norwegian. This carrier has in fact expressed interest in establishing a base at Amsterdam Airport Schiphol. It is uncertain whether they will actually do so, but their fleet expansion plan reveals this ambition. Apart from Norwegian, it is plausible that a LHLCC from another continent adds a Dutch airport to its route network, provided they have traffic rights.

Another question is whether or not Air France-KLM will establish a LHLCC in Amsterdam. Of course, no definite answer can be given, but this seems unlikely to occur in the near future. On the one hand, Air France-KLM may not want to 'fall behind' Lufthansa, which has a long-haul low-cost subsidiary (Eurowings), and will therefore establish one itself in Amsterdam. Unions may not accept such strategy considerations however, and instead will regard this as another means of cutting labour costs. After all, Eurowings' pilots earn substantially less than their colleagues at Lufthansa. On the other hand, Air France-KLM may find better use of its capital elsewhere within its organisation (e.g. fleet renewal and expansion of its LCC Transavia). Further, Air France-KLM's recently announced new airline for long-haul flights – (preliminarily) named Boost – will be based at Paris Charles de Gaulle, hence, even if Boost develops into a long-haul low-cost airline, it will not be situated in Amsterdam.

When discussing the impact of market entry of long-haul low-cost airlines in the Netherlands, a distinction can be made between size (e.g. airport capacity involved) and scope (e.g. markets involved). First, when considering the impact of market entry in terms of size, it was found that Amsterdam Airport Schiphol and Eindhoven Airport were best suited to accommodate LHLCC compared to the other Dutch airports. This conclusion is based on their infrastructural facilities and their market size. An advantage for Schiphol is its current traffic volume in the low-cost market, which can be beneficial for long-haul low-cost airlines striving to exploit the possibilities from self-connecting traffic. An advantage for Eindhoven is their large catchment area. Conversely, slot availability restricts the options for new airlines, particularly with regard to building a feeder network. Schiphol has nearly reached its maximum (capped) capacity of 500,000 flight movements per year, and the reliever airport Lelystad will not be operational until 2019. The overall conclusion is that in terms of size the expected impact of long-haul low-cost on the Netherlands is likely to be rather small.

Second, when looking at the impact of market entry in terms of scope, the impact will depend on the routes that the long-haul low-cost carrier chooses. One of the previous conclusions was that a focus on uncontested markets and preferably a relatively low share of business passengers/high share of leisure passengers is more likely to become successful. If the LHLCC primarily operates in such niche markets, the consequences for the KLM network and Schiphol's connectivity are likely to be rather limited.

Based on market size, the presence of an Open Skies Agreement and current competition, such markets can be found in the US. Given the advantages of narrow-bodies, the US east coast may be particularly interesting. However, owing to the dynamics in the market, the analysis does not stop there. The presence of LCCs on the transatlantic market, even when their market share is small, may disrupt the dominance of the immunized joint ventures of the three big airline alliances (SkyTeam, STAR, oneworld). This occurs mainly at the bottom end of the market, where the incumbents' response may be to lower fares on a relatively small portion of their seats. These airlines know that while a low-cost entrant may initiate some market creation, they can potentially take business away through hub-bypassing, for example.

Hub-bypassing is also a threat for Schiphol. Long-haul low-cost lowers the threshold for direct connections, and some European passengers for instance may no longer have to transfer at Schiphol on their way to the US. Schiphol can therefore try to attract long-haul low-cost carriers itself by stimulating self-transfer through the provision of new airport services, although the airport may be in two minds about this. On the one hand, Schiphol may want exploit such market opportunities, while on the other the growth of self-transfer may come at the expense of the KLM network, which is more important for the connectivity of Schiphol. The overall conclusion is that in terms of scope the expected impact of long-haul low-cost on the Netherlands is also likely to be rather limited.

Samenvatting

Low-cost carriers (LCCs) zullen naar verwachting steeds meer op lange afstanden (*long haul*) gaan vliegen. Het *long-haul low-cost* (LHLC) businessmodel zal echter veel minder grote veranderingen teweegbrengen dan de introductie van de LCCs destijds op de markt voor kortereafstandsvluchten. Veel van de eigenschappen die maken dat LCCs zo succesvol concurreren met de gevestigde *full-service carriers* (FSCs), gaan op langeafstandsvluchten namelijk minder op. Daardoor zijn de kostenbesparingen kleiner. Om die reden zijn er wereldwijd maar weinig luchtvaartmaatschappijen die het LHLC-businessmodel succesvol toepassen. Door onder andere de ontwikkeling van energie-efficiëntere vliegtuigen en nieuwe transferopties (zoals *self-transfer*) is te verwachten dat *long-haul low-cost carriers* (LHLCs) toch de Nederlandse markt zullen betreden, vooral op Schiphol en (in mindere mate) de luchthaven van Eindhoven. De impact die dat heeft op de connectiviteit van Schiphol en het netwerk van KLM, is waarschijnlijk beperkt.

In deze studie bestudeert het Kennisinstituut voor Mobiliteitsbeleid (KiM) het potentieel van het LHLC-businessmodel in het licht van ontwikkelingen op de arbeidsmarkt, de vliegtuigmarkt en de markt voor transferpassagiers. Het KiM voerde dit onderzoek uit, omdat het voor het Nederlandse luchtvaartbeleid van belang is inzicht te hebben in de onzekerheden over het potentieel van LHLC en de mogelijke consequenties voor de connectiviteit van Schiphol en het netwerk van KLM. De studie is gebaseerd op literatuuronderzoek, aangevuld met enkele interviews met luchtvaartdeskundigen met een diverse achtergrond. Hiernaast organiseerde Airneth een seminar over het potentieel van LHLC.

De beperkingen van *low-cost* op langeafstandsvluchten

De strategie van LCCs is in beginsel simpel: ze laten alle activiteiten weg die niet essentieel zijn voor het leveren van hun kernproduct, namelijk een vlucht van A naar B. Hierdoor kunnen ze de kosten laag houden terwijl ze toch voldoen aan de basisbehoefte van de klant. Naarmate de vluchtduur toeneemt, stellen passagiers echter hogere eisen. Ook zijn er andere factoren die ertoe leiden dat het LCC-model in zijn puurste vorm niet goed toepasbaar is op langeafstandsvluchten. Denk aan de noodzaak om transferpassagiers aan te trekken.

Om op langeafstandsvluchten te kunnen concurreren met de gevestigde FSCs zullen de LCCs hun businessmodel moeten aanpassen. Hierdoor zal het kostenvoordeel ten opzichte van de FSCs beduidend lager uitvallen dan op kortereafstandsvluchten. Luchtvaartdeskundigen betwijfelen zelfs of het kostenvoordeel wel voldoende zal zijn om effectief te kunnen concurreren. Hiernaast is ook de routekeuze (met een focus op markten zonder directe concurrentie) een belangrijke concurrentiefactor.

Er is wereldwijd slechts een handjevol LHLCs actief. AirAsia X en Norwegian zijn daarvan de grootste. Deze maatschappijen vertonen een aantal overeenkomsten met 'typische' LCCs, zoals een homogene vloot en een hoge stoeldichtheid, maar op andere punten hebben ze (op verschillende wijze) het LCC-model aangepast. Beide maatschappijen faciliteren bijvoorbeeld de overstap van transferpassagiers. AirAsia X doet dat op zijn grote hub in Kuala Lumpur, terwijl Norwegian meerdere kleinere hubluchthavens gebruikt. De verschillen tussen beide maatschappijen en het feit dat zij aanpassingen aan hun businessmodel blijven doen, duiden erop dat ze in een leerproces zitten en bezien hoe ze het LHLC-businessmodel het meest winstgevend kunnen inzetten.

Ontwikkelingen in de luchtvaart

Op hoofdlijnen zijn de volgende actuele ontwikkelingen in de luchtvaart van belang voor het potentieel van het LHLC-businessmodel:

1. Ontwikkelingen op de arbeidsmarkt, omdat arbeid een grote kostencomponent is voor luchtvaartmaatschappijen;
2. Ontwikkelingen op de vliegtuigmarkt, omdat nieuwe vliegtuigtypen een efficiënter brandstofverbruik en een groter vliegbereik hebben;
3. Ontwikkelingen op de markt voor transferpassagiers, omdat transferpassagiers op de meeste langeafstandsvluchten nodig zijn om lege stoelen op te vullen.

Besparingen op arbeidskosten

LHLCs kunnen ten opzichte van FSCs het meest besparen op arbeidskosten. Op dit punt zijn er echter twee onzekerheden om in gedachten te houden. Ten eerste betalen LCCs vaak een relatief laag loon en werkt een deel van hun personeel op basis van 'atypische' contracten, inclusief zogenoemde *pay-to-fly*-afspraken. Het is de vraag in hoeverre de samenleving (in het bijzonder de politiek) dit blijft accepteren. In de tweede plaats zal het potentiële verschil in arbeidskosten tussen FSCs en LHLCs kunnen gaan afnemen doordat ook FSCs hun arbeidskosten omlaag brengen, via onderhandelingen dan wel vervanging van personeel. Dit leidt op dit moment al tot frequente stakingen door hun piloten en cabinepersoneel.

Long-haul low-cost carriers profiteren van nieuwe vliegtuigtypen

Boeing en Airbus hebben recentelijk nieuwe vliegtuigtypen gelanceerd in het *widebody*-segment³⁵ (bijvoorbeeld de B787 en A350), en op korte termijn introduceren ze ook nieuwe toestellen in het *narrowbody*-segment (bijvoorbeeld de B737MAX en A321NEO LR). Vanwege de verbeterde brandstofefficiëntie en het toegenomen vliegbereik is het aannemelijk dat het aantal *narrowbody*-vliegtuigen op langeafstandsvluchten zal toenemen. LHLCs profiteren sterker van deze ontwikkelingen op de vliegtuigmarkt dan FSCs, en wel om uiteenlopende redenen:

- de verbeterde brandstofefficiëntie zorgt ervoor dat het aandeel van brandstof in de totale operationele kosten afneemt, waardoor er meer ruimte ontstaat om op andere kostenposten te concurreren;
- de *narrowbody*-vliegtuigen vergroten het aantal routeopties (vooral in nichemarkten waarin FSCs geen interesse hebben), vanwege hun toegenomen vliegbereik en relatief geringe omvang;
- de *narrowbody*-vliegtuigen maken het mogelijk voor LCCs die ook op long-haul actief zijn, om een homogene vloot te behouden en daardoor een hogere benutting te realiseren, omdat de toestellen op de korte en lange afstand uitwisselbaar zijn;
- de inzet van nieuwe vliegtuigtypen draagt bij aan een verlaging van de operationele kosten van LHLCs ten opzichte van FSCs met een relatief oude vloot. Dit is een tijdelijk voordeel.

Mogelijk kiezen transferpassagiers voor long-haul low-cost

Ook ontwikkelingen op de markt voor transferpassagiers zijn van belang, en in het voordeel, van LHLCs: *self-transfer* en *low-cost transfer*. *Self-transfer* is een proces waarbij de passagier zijn eigen overstap regelt. Op dit moment is *self-transfer* relatief onbekend, maar dat verandert. Boekingssites zoals Skyscanner laten bijvoorbeeld reisopties zien die gebruikmaken van *self-transfer*. En luchthavens zoals Gatwick bieden nieuwe diensten aan die het overstapproces voor passagiers vergemakkelijken; ze worden zogenoemde virtuele hubluchthavens.

Low-cost transfer verwijst zowel naar het zogenoemde *interlining*, waarbij een reis wordt uitgevoerd door twee onafhankelijke LCCs, als naar het zogenoemde *intra-lining*, waarbij een reis wordt uitgevoerd door twee LCCs van hetzelfde concern. Vanwege de organisatorische complexiteit die inherent is aan het transferproces, zijn LCCs voornamelijk betrokken bij *inter-* dan wel *intra-lining*, maar ook dit verandert. In Europa hebben diverse LCCs verkennende stappen gezet, zoals de samenwerking tussen Ryanair en Norwegian op Gatwick. Het succes van deze ontwikkelingen hangt af van de incrementele

³⁵ Een *widebody*-vliegtuig heeft twee gangpaden, terwijl een *narrowbody*-vliegtuig slechts één gangpad heeft. De capaciteit van *widebody*-vliegtuigen is groter.

opbrengsten en kosten voor de betrokken maatschappijen, zoals het risico op zoekgeraakte bagage en gemiste vluchten.

Long-haul low-cost in Nederland

Het is te verwachten dat LHLCCs zullen toetreden tot de Nederlandse markt. Een LCC die al langeafstandsvluchten uitvoert, zoals Norwegian, ligt daarbij het meest voor de hand. Hiernaast is het goed mogelijk dat een maatschappij van een ander continent, die over de vereiste landingsrechten beschikt, een Nederlandse luchthaven aan zijn routenetwerk toevoegt. Daarentegen lijkt het niet waarschijnlijk dat Air France-KLM een eigen LHLCC vanaf Schiphol laat opereren. Air France-KLM heeft aangekondigd te zullen starten met een nieuwe luchtvaartmaatschappij die, onder de (voorlopige) naam Boost, goedkope langeafstandsvluchten aanbiedt, maar die maatschappij wordt gestationeerd op de luchthaven Charles de Gaulle in Parijs. Dus zelfs als Boost zich ontwikkelt tot *long-haul low-cost carrier*, zal ze evengoed niet vanaf Schiphol vliegen.

Beperkte impact op Schiphol en KLM

Van de Nederlandse luchthavens zijn Schiphol en Eindhoven Airport het best gepositioneerd om LHLCCs te accommoderen. Dit is vooral vanwege de aanwezige infrastructuur, de omvang van hun verzorgingsgebied en het huidige passagiersvolume in het *low-cost*-segment. Echter, de beschikbaarheid van start- en landingsmogelijkheden beperkt uitbreiding van *long-haul low-cost*. Schiphol zit al bijna aan zijn maximale (opgelegde) capaciteit van 500.000 vliegbewegingen per jaar en de uitwijkvluchthaven Lelystad is niet operationeel tot 2019. Ook voor Eindhoven geldt dat de capaciteit beperkt is. Bovendien zijn de mogelijkheden voor passagiers om over te stappen beperkter dan op Schiphol.

De impact die de markttoetreding van LHLCCs zal hebben, hangt vooral af van het soort routes waarop deze maatschappijen actief worden. Opereren zij vooral in (niche)markten zonder directe concurrentie, dan blijft de impact op de connectiviteit van Schiphol en het netwerk van KLM waarschijnlijk beperkt. Toch kan de aanwezigheid van LCCs op bijvoorbeeld de trans-Atlantische markt de dominantie van de drie grote luchtvaartallianties verstoren, waarop de gevestigde FSCs kunnen reageren met ticketprijsverlagingen. Die maatschappijen weten dat een nieuwe LCC waarschijnlijk in enige mate zijn eigen markt creëert, maar toch een deel van de vraag kan overnemen, bijvoorbeeld via *hub-bypassing*.

Hub-bypassing is tevens een mogelijk risico voor Schiphol, omdat LHLCCs het aantal directe verbindingen doen toenemen en een deel van de passagiers geen overstapluchthaven meer nodig heeft. Schiphol kan hierop inspelen door zelf LHLCCs aan te trekken, bijvoorbeeld door *self-transfer* te faciliteren. De luchthaven hinkt hierbij mogelijk op twee gedachten, omdat de groei van *self-transfer* en LHLCC ten koste kan gaan van uitbreiding van het KLM-netwerk, wat belangrijker is voor de connectiviteit van Schiphol.

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Appendix

Interviews

For this project we conducted several interviews with aviation experts of varying backgrounds. This was necessary owing to the specific nature of some of the research questions. Interviews were conducted with:

- Berend Onnes and Özgür Ulutas, traffic analysts for Amsterdam Airport Schiphol;
- Evert Jesse, aircraft engineer for ADSE;
- Frankie O'Connell, lecturer in Airline Management at Cranfield University (UK);
- Rigas Doganis, non-executive director at easyJet;
- Sveinn Gudmundsson, professor in Strategic Management at Toulouse Business School;
- A network planner for a long-haul low-cost airline (anonymous).

Airneth seminar

Airneth is an initiative to support aviation policy in the Netherlands using the most recent insights from academic experts from various disciplines. In addition, it has the objective to address important policy issues in the academic world. Airneth is financed by KiM.

For this project Airneth organized a seminar titled *The Feasibility of Long-Haul Low-Cost Operations* on December 9 2015, in The Hague. The speakers were:

- Alain Lumbroso (chair), economist for OECD;
- Bogdan Delicostea and Hanna Schaal, aviation consultants for PROLOGIS;
- Guillaume Burghouwt, aviation researcher for SEO;
- Jeroen Erdman, network planner for Transavia;
- Sveinn Gudmundsson, professor in Strategic Management at Toulouse Business School.

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Authors

Maarten de Lange
Hugo Gordijn

Reviewer

Eddy van de Voorde

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VormVijf, the Hague

KiM Netherlands Institute for Transport Policy Analysis
P.O. Box 20901
2500 EX The Hague
Netherlands

Telephone: +31 (0)70 456 19 65
Fax: +31 (0)70 456 75 76

Website: <http://english.kimnet.nl>
E-mail: info@kimnet.nl

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