Amsterdam, November 2017
Commissioned by Ministry of Infrastructure and Environment

Characteristics Monitor Aviation Market Netherlands – United Arab Emirates

2009-2017

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SEO report no 2017-79

Summary

Over the last eight years, airlines from the United Arab Emirates have established a stronger position in the market between the Netherlands and the United Arab Emirates. In 2017, Emirates provided three quarters of the seating capacity to Dubai, and Etihad and KLM had an equal market share on the route to Abu Dhabi. KLM not only experiences competition on flights to the United Arab Emirates, but also on destinations in Asia, Africa, and the Middle East that are indirectly served by Emirates and Etihad through their respective hubs.

This monitor describes the developments in the aviation market between the Netherlands and the United Arab Emirates (UAE). The analysis focuses both on the direct market between the Netherlands and the UAE and on the key 'beyond markets'; these are direct KLM destinations on which airlines from the UAE compete by offering indirect connections via their hubs. Finally, an econometric analysis has been done in order to draw general conclusions about the possible effects of a growing market share of airlines from the UAE on the ticket price.

Market between the Netherlands and the UAE

Two direct scheduled flights are offered between the Netherlands and the UAE: from Schiphol to Dubai and from Schiphol to Abu Dhabi. The following section describes the most important developments in terms of supply and demand for the two separate markets.

Dubai

On the route to Dubai, three airlines are active. KLM offers one daily flight and ten weekly flights during the winter season (November-March). Emirates has been active in this market since 2010, and since 2013 they offer two flights a day. Since 2016, the largest passenger aircraft is used for both frequencies, namely the Airbus A380. Through this, Emirates provides nearly three quarters of the seating capacity. During the winter season, KLM's subsidiary Transavia also offers flights between Schiphol and Dubai.[1]

An analysis of the ticket prices of KLM and Emirates between 2014 and 2017 shows that both airlines offer plane tickets at comparable prices. Compared to the prices offered for other destinations, the prices per kilometre in the market between Schiphol and Dubai do not deviate.

The increasing supply in the market to Dubai is accompanied by an increasing number of origin and destination passengers between Schiphol and Dubai. Additionally, the airlines involved fill the increased seating capacity with extra transfer passengers. The transfer percentage of the operations to Dubai has increased from 70% in 2013 to 73% in 2016. This includes transfer passengers at Schiphol (often) connecting to the KLM flight to Dubai, and also includes transfer passengers who transfer at Dubai (often) to a connecting Emirates flight.

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1 In addition to this, Garuda Indonesia (June 2010-December 2013) and ArkeFly/TUI (winter season 2011-2013) have also been active in the Schiphol-Dubai market.

Abu Dhabi

Between Schiphol and Abu Dhabi, two airlines were active in 2017: KLM and Etihad. In 2013, the number of flights and the offered seating capacity doubled with the entry of Etihad. Between 2014 – when Garuda ended their flight offer between Schiphol and Abu Dhabi – and 2017, little has changed in terms of the offer on this route. During the summer season of 2017, KLM lowered the number of weekly flights to Abu Dhabi from seven to five.

Just as in the market to Dubai, the ticket price analysis shows that the prices of KLM and Etihad to Abu Dhabi are on the same level. The prices per kilometre are also on a similar level as the offered prices on other destinations.

What is notable for the Abu Dhabi route, is that the increased seating capacity is mostly filled with transfer passengers. In 2016, the transfer percentage on this route was over 87%, against a transfer percentage of 62% in 2012, before the entry of Etihad. The origin-destination market between the Netherlands and Abu Dhabi is strikingly smaller than the Dubai market.

Markets Beyond the UAE

UAE airlines also compete with KLM on other destinations in Asia, Africa, and the Middle East by offering indirect connections through their hubs in Dubai and Abu Dhabi. This analysis will examine ten markets that are directly served by KLM, but in which Emirates and Etihad also transport great numbers of passengers through their respective hubs Dubai and Abu Dhabi. These are Jakarta, Bangkok, Kuala Lumpur, Manila, Johannesburg, Cape Town, Delhi, Singapore, Muscat and Hong Kong.

Since 2009, the number of (direct) frequencies offered by KLM to these destinations has remained stable, with the exception of an increase of the number of flights to Kuala Lumpur and Muscat. KLM's seating capacity has increased for all ten destinations. The greatest increase was realised on the flight to Bangkok, 52% compared to 2009. For the remaining destinations, the increase of seating capacity fluctuates between 29% (Muscat) and 1% (Hong Kong).

The offered ticket prices have not changed substantially since 2014. The market to Delhi is the only one for which the average offered prices decreased by about 10% between 2015 and 2016. This was most likely an effect of the entry of Jet Airways to Schiphol in 2016.

Compared to 2011, KLM has lost market shares to Emirates and Etihad in all of the ten beyond markets. In four of the ten markets, KLM saw an absolute decrease in the number of passengers. This particularly applies to Jakarta (from more than 16,500 in 2011 to 14,000 in 2016), Delhi (from more than 18,500 in 2011 to 15,000 in 2016), and Muscat (from over 10,000 in 2011 to nearly 8,000 in 2016). Partly through offering competing ticket prices, the UAE airlines have brought about an increased market demand (market generation) and have furthermore managed to attract a portion of the KLM passengers.

Competition Impact on Ticket Prices

Will a growing market share of airlines from the UAE bring about a decrease in ticket prices? The general perception is that increased competition – by Arabian Gulf airlines – will lead to lower ticket prices. However, according to economic theory, this effect depends on the current market position: if an airline has a limited market share, an increase of that market share will have a negative effect on the price; while an increase of market share will often lead to a price increase when the airline in question already holds a relatively dominant position.

Econometric analysis shows that an increased market share of UAE airlines does not lead to lower ticket prices in all cases. In general[2], an increased market share of both KLM and Emirates will lead to a price increase. This is in line with the expectation that a larger market share will lead to higher prices. For both airlines, this is particularly true for markets in which they already hold a strong position: for Emirates particularly on destinations in the Middle East and India, and for KLM in the markets they service directly. In the ten key beyond markets that were examined in the previous analysis, a growing market share of Emirates will lead to a decrease in ticket price: in general, a market share increase of 10 percentage points leads to a price decrease of 4.5%.

[2] Based on an analysis of 4121 ticket prices to 67 directly or indirectly served destinations from Schiphol.

Contents

1 Introduction

The aviation market between the Netherlands and the United Arab Emirates has seen drastic change over the past years. This monitor analyses the key developments in terms of frequencies offered, seating capacity, ticket prices and passenger demand.

The bilateral Aviation Agreement (luchtvaartpolitieke overeenkomst, LVO) between the Netherlands and the United Arab Emirates (UAE) is quite liberal in nature. However, Articles 6 and 9 of the LVO between the Netherlands and VAE do reflect a number of basic principles with regard to the development of transport on the routes between the Netherlands and UAE and underlying points. These are principles with regard to:

- Rates: Under the new article, rates are primarily determined by the market. Only in exceptional circumstances, such as taking advantage of monopoly situations or taking advantage of positions of power, can the aviation authorities interfere in above-mentioned situations. This also applies to predatory pricing.
- Fair and Equal Opportunities: designated airlines are given the opportunity to exploit the services on described routes in an equal manner.
- Reasonability: designated airlines of one party take into account the interests of the airlines of the other party, in order to prevent that the services that are provided on the same route (or parts thereof) are conducted in a reasonable manner.
- Transport Need: services are to be aligned with the transport needs of the public on the routes described and are to provide sufficient capacity for the current and reasonably expected needs for transport to and from the territory of the contracting parties. Transport to and from other states than the designated state will be coordinated with the transport need between this other country and the designated country.

The Directorate-General of Accessibility (Directoraat-Generaal Bereikbaarheid, DGB) of the Ministry of Infrastructure and Environment has asked SEO Economic Research to monitor the capacity, demand, and price developments on the routes between the Netherlands and the UAE with respect to these principles, in terms of passenger transport. Furthermore, DGB has expressed an interest in the possible effects of competition between airlines from the UAE on markets beyond Dubai and/or Abu Dhabi in terms of capacity, market demand, and ticket price. In this present report, SEO Economic Research will present the results of this monitor.

This study is an update of a previous monitor conducted by SEO Economic Research on the aviation market Netherlands – United Arab Emirates.[3] Generally, the analysis results have been supplemented with the most recent data. In some cases, the data may differ due to the use of new, different data sources. If this is the case, an explanation will be provided in the accompanying text or footnote.

[3] SEO (2015). Monitor Characteristics Aviation Market Netherlands – United Arab Emirates. SEO report no 2015-37. http://www.seo.nl/uploads/media/2015-37_Monitor_karakteristieken_luchtvaartmarkt_Nederland-VAE.pdf

2 Research Method

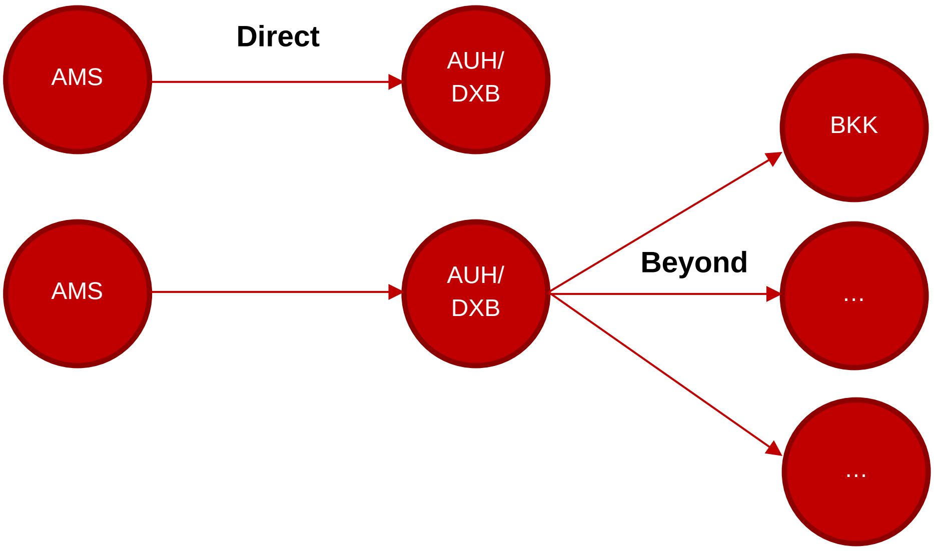
In order to monitor the traffic development between the Netherlands and the United Arab Emirates, SEO examines different aspects of traffic and transport. In addition to local origin-destination transport between the Netherlands and the UAE, the development of supply and demand in the key beyond markets is also expounded.

2.1 Markets Covered by the Monitor

At present, passenger transport between the Netherlands and the United Arab Emirates (UAE) takes place on the direct routes Schiphol – Dubai (DXB) and Schiphol – Abu Dhabi (AUH). However, the market for which the addition of extra capacity from an airline potentially has an impact, is much broader than just the market Schiphol – Dubai/Abu Dhabi (see Figure 2.1). Therefore, the relevant market to which the monitor relates is as follows:

1. The market Schiphol – Dubai and Schiphol – Abu Dhabi: extra operations of an airline on one of the routes can affect the traffic and transport of other airlines on the routes.
2. The market Schiphol – beyond Dubai and beyond Aby Dhabi: extra operations of an airline with its base in Dubai of Abu Dhabi can have implications for the transport of other airlines that directly or indirectly service the same beyond-destinations from Schiphol.

Figure 2.1 Distinction direct market and beyond markets



Source: SEO

The previous version of this monitor also took into account developments in the so-called “behind markets”. These are airports from which KLM transports transfer passengers via Schiphol to destinations in the UAE and elsewhere in Asia. The transport demand in these transfer markets may decrease because airlines from the UAE fly directly to these (often European) airports, causing Schiphol to be avoided as a transfer airport. In this version, a choice was made to leave out this analysis since the effects on the European aviation network are dependent on a large number of factors, of which competition from UAE airlines is only one of many. Although this is true to a lesser extent for the beyond markets, the developments here can also not simply be attributed to increasing competition of UAE airlines.

2.2 Relevant Indicators per Market

For each market, this report presents the development in terms of supply, price, and realised demand. Per market, this relates to the following indicators:

- Number of airlines that are active in the relevant market (only applies to the direct routes Schiphol – Dubai and Schiphol – Abu Dhabi);
- Offered seating capacity;
- Offered frequencies;
- Offered prices;
- Realised passenger volumes.

This report charts the results per indicator and origin-destination market, for which the recent developments in the market may be seen as possible explanations for notable results. In particular with regard to the developments on the markets beyond the UAE, this cannot simply be attributed to the extra frequencies of Emirates. A large number of factors play a role in this development, which largely fall outside the scope of this research. Examples are the development of the offer and the pricing of other airlines, and the development of demand in the relevant origin-destination markets. When mapping the developments in the beyond routes, the analyses solely focuses on airlines from the Netherlands and the UAE.

2.3 Econometric Analysis

Additionally, an econometric analysis has been performed in order to draw more general conclusions about the effects of growing competition of UAE airlines on ticket prices. To this end, use has been made of a data set of monthly booked ticket prices between 2011 and 2016. The effects of a change in market share for Emirates, Etihad, and KLM on the ticket prices will be measured for 67 destinations in Asia, Africa, Australia, and the Middle East.

2.4 Data Sources

The different analyses are based on the following data sources:

- **OAG Schedules Analyser:** Number of airlines, offered seating capacity, and frequencies
- **OAG Traffic Analyser:** Realised passenger volumes, transfer percentages, and booked ticket prices
- **SEO Ticket Price Monitor:** Offered ticket prices, collected through web scraping of www.expedia.com and www.orbitz.com.

3 Market Context

The position of the networks of European network carriers, for instance KLM, is under pressure. On a European level, pressure is put on the margins primarily by low cost carriers; on an intercontinental level, the rise of the Arabian Gulf carriers and Turkish Airlines stands out in particular. These latter parties are growing at a significantly faster rate than KLM in terms of offered seating capacity and available seat kilometres. Besides this, the share of Schiphol in the total number of transfer passengers is decreasing on a global scale, while hub airports such as Dubai and Doha are quickly gaining in transfer shares. Scientific empiricism indicates that the entry of Arabian Gulf carriers leads to a significant generation of market, but also to a downward pressure on prices and thus on the margins of the existing airlines that service the respective routes.

3.1 Introduction

The hub operations of SkyTeam at Schiphol, primarily made up of KLM, is crucial for the international connectivity of the Netherlands and enables the country to benefit from a much more extensive network of destinations than which is possible on the basis of local transport demand alone. This is because a large portion of the seats on European and Intercontinental KLM flights are filled by transfer passenger. Without these hub operations, the number of direct destinations would be much lower. Furthermore, the flight frequency at many destinations would also be lower.

However, the position of European hub carriers – among which KLM – is fragile. During the last fifteen years, the increasing competition in the aviation market has put pressure on the margins of airlines such as Air France-KLM, Lufthansa, and British Airways. On the one hand, the increasing competition is caused by the rapid growth of price fighters such as easyJet, Ryanair, Norwegian, and Vueling. Their market share has grown from a few per cent around the turn of the century, to 34 per cent in 2016. On the other hand, the growing competition is caused by the growth of new generation hub carriers from the Middle East and Turkey. Benefiting from the excellent geographical locations of their hubs a well as low operational costs, airlines such as Emirates, Etihad, Qatar Airways, and Turkish Airlines have taken up a strong position, particularly in the growth market between Europe and Asia.

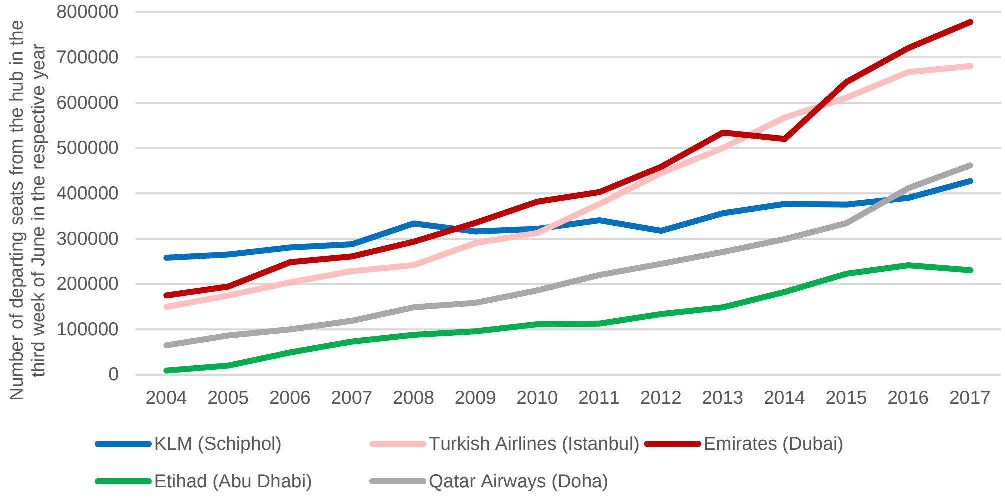
The growing competition has led to shrinking market shares for the European hub carriers, as well as a smaller margin per transported passenger. In order for European hub carriers to remain competitive, significant cost reductions are required. This, however, is not easy: European hub carriers bear an inheritance of high labour costs and generous terms of employment, which, owing to the strong position of trade unions, are difficult to adjust. Additionally, maintaining a hub network is costly by definition. Simplification of the costly hub system will lead to loss of connectivity, which undermines their own business model and the extensive aviation network.

This monitor study focuses specifically on the market between the Netherlands and the United Arab Emirates (UAE), and in particular on the competition between KLM and Emirates and Etihad. Among other things, it covers the development in capacity, passengers, and prices in the direct markets and the relevant beyond markets. This chapter will provide insight into the most important market developments in a broader sense and is illustrative for the increasing competition which KLM faces.

3.2 Development Offered Capacity

Figure 3.1 shows that the total capacity which KLM offers from Schiphol between 2004 and 2017 has slightly increased. This growth clearly lags behind that of the key hub carriers from the Middle East and Turkey. Emirates, Turkish Airlines, and, more recently, Qatar Airways have surpassed KLM in terms of offered seating capacity.

Figure 3.1 Offered capacity of Gulf carriers and Turkish Airlines from their respective hubs is growing significantly more rapidly than that of KLM from Schiphol[4]



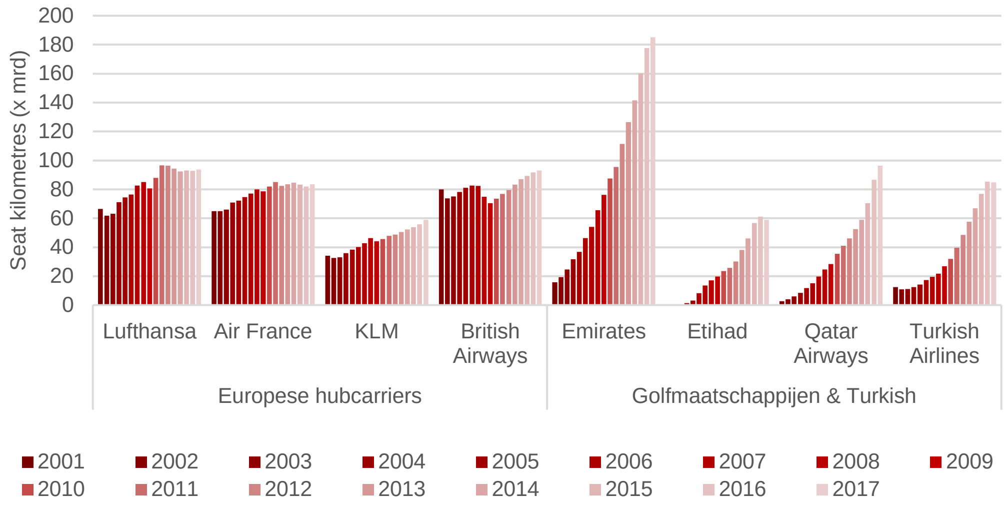
Source: Official Airline Guide (OAG), revision SEO Economic Research

Following this, Figure 3.2 shows that the number of available seat kilometres (ASK[5]) of the Gulf carriers and Turkish Airlines has experienced a strong growth. The European hub carriers show growth as well, but this is largely exceeded by the growth of Emirates in particular. The fact that Emirates has a higher score than Turkish Airlines in terms of ASK, is related to Emirates' use of larger aircrafts, combined with longer flying distances (on average). The growth involves large-scale investments in terms of both fleet (aircraft purchases) and expansion of the airport infrastructure.

4 Between May and July 2014, extensive airstrip maintenance took place on Dubai, which explains the dip in the offered capacity of Emirates in 2014.

5 Expressing the available capacity in ASK is a common method for indicating the size of an airline. It takes into account the number of available seats as well as the distance flown for those seats.

Figure 3.2 Gulf carriers and Turkish Airlines show a significantly stronger growth in terms of available seat kilometres than European hub carriers



Source: Official Airline Guide (OAG), revision SEO Economic Research

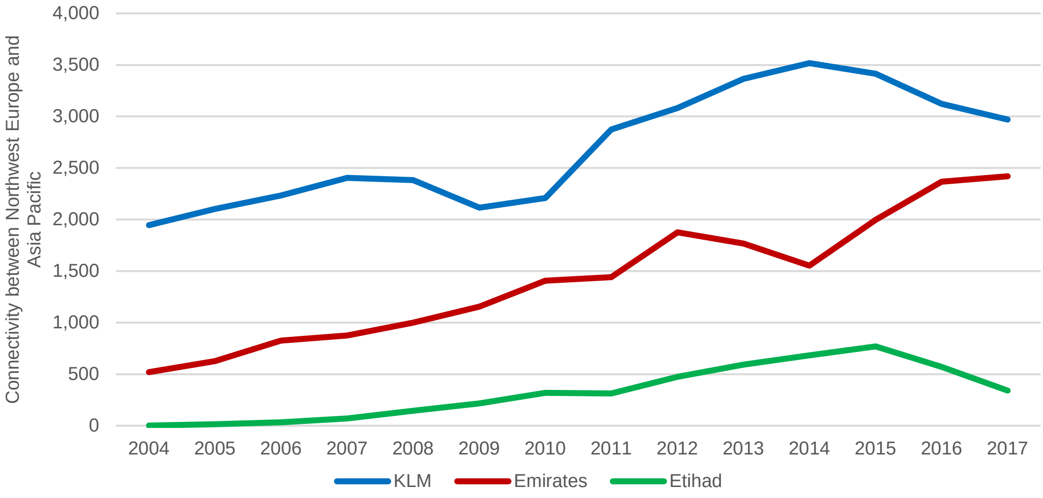
3.3 Development Connectivity

Figure 3.3 shows that the available connectivity in the market between Northwest Europe[6] and Asia/Pacific has increased between 2004 and 2017 for both KLM and Emirates and Etihad. The total connectivity[7] between Northwest Europa and Asia/Pacific offered by KLM, Emirates, and Etihad combined has increased by more than 130 per cent between 2004 and 2017. The level of competition by the Gulf carriers has increased at the same time. In the market between Northwest Europe and Asia/Pacific, compared to Emirates and Etihad, the market share of KLM (measured in connectivity) has decreased from 79 per cent in 2004 to 52 per cent in 2017. Only the market shares of KLM, Emirates, and Etihad have been taken into account here. Other airlines were excluded from this consideration. Between 2004 and 2017, however, the connectivity of KLM does increase in the market between Northwest Europe and Asia/Pacific: from nearly 1950 in 2004 to nearly 3000 connectivity units in 2017. However, the connectivity KLM offers between Northwest Europe and Asia/Pacific decreases by more than 15% between 2014 and 2017 (from over 3500 to nearly 3000). This is caused by several factors. The connectivity to Japan decreases because of the withdrawal of the Japanese KLM destination Fukuoka, and a drop in frequency to Tokyo. In addition to this, China Airlines stopped flying to Bangkok and Malaysia Airlines ceased operations between Schiphol and Kuala Lumpur. Both airlines are partners of KLM and therefore bring about a negative effect on the connectivity of KLM between Northwest Europe and Asia/Pacific.

6 Northwest Europa includes Belgium, Denmark, Germany, Finland, France, Ireland, Luxembourg, Netherlands, Norway, United Kingdom, Sweden, and Switzerland.

7 The total connectivity consists of both direct flights to Asia/Pacific (direct connectivity) and flight with transfer on a certain airport (indirect connectivity).

Figure 3.3 Connectivity between Northwest Europe and Asia/Pacific has increased for both KLM and Emirates and Etihad; the relative growth is greatest for Gulf carriers.



Source: Official Airline Guide (OAG), revision SEO Economic Research based on NetScan Model

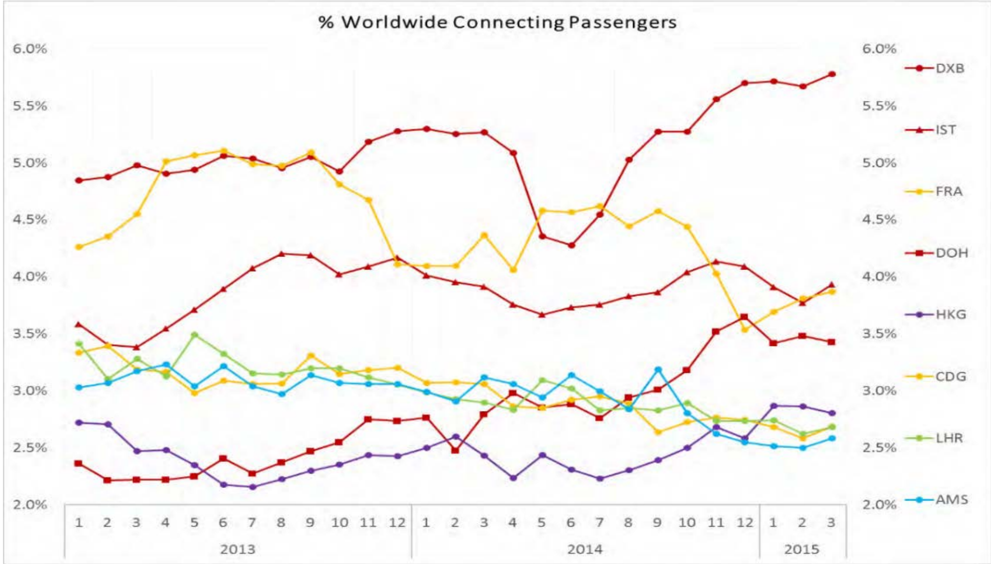
3.4 Global Share Transfer Passengers

Schiphol's share in the total number of transfer passengers globally decreased over the past years (see Figure 3.4). This does not mean that the absolute number of transfer passengers for Schiphol has decreased, but mainly implies that other hub airports (in terms of transfer passengers) see stronger growth than Schiphol. The Figure shows that this is mainly true for Dubai (DXB) and Doha (DOH), and to a lesser extent to Istanbul (IST).

Suau-Sanchez and Voltes-Dorta[8] furthermore show that Schiphol's transfer share is drastically decreasing in the market segment United Kingdom-Asia/Pacific. This is not so much owing to a rise of the Gulf carriers' share, but rather to an increase in the domestic network of British Airways, which means that many secondary British airports are now (much better) connected to the British Airways hub London Heathrow. There are several other causes which can lead to increased competition pressure on Schiphol and KLM. In the market segment United Kingdom-Middle East, Schiphol's transfer share has suffered from the market share of the Gulf hubs and Istanbul.

8 Analysis is from the Airneth Lunch Seminar "London Airport Expansion Debate: The role of Amsterdam in providing connectivity to the UK", 28 May 2015, The Hague.

Figure 3.4 European hub airports are losing market shares in global market for transfer passengers; Gulf hubs are becoming increasingly important[9]



Source: Suau-Sanchez & Voltes-Dorta (2015)[10]

3.5 Scientific Literature on Gulf Carriers

Recent empirical evidence has shown that the effect of the entry of Gulf carriers into the American market is twofold.[11] On the one hand, it leads to a significant increase in the number of passengers. On the other hand, the researchers conclude that competition by Gulf carriers leads to a small but significant decrease of the number of passengers of American hub carriers and their prices in markets between the United States and Africa, Asia, Australia, and Europe. From a consumer perspective, this is a positive effect in the short term. However, the effect for the American hub carriers is negative, with possible second-order network effects as a result. In an analysis of the effect of the entry of Gulf carriers into the German market, a strong effect of market generation is found as well.[12]

It is likely that the effect as described above, will also occurs with entry into other European markets. This implies that the entry of Gulf carriers into the Dutch market contributes to, on average, low ticket prices for consumers and businesses, but also to further competition pressure on hub carrier KLM. This brings about correspondingly negative effects on profitability, which is logically accompanied by an increase of the degree of competition.

9 Here, it is also visible that between May and July 2014, extensive airstrip maintenance took place on Dubai, explaining the dip in the offered capacity of Emirates in 2014.

10 This figure is from the Airneth Lunch Seminar "London Airport Expansion Debate: The role of Amsterdam in providing connectivity to the UK", 28 May 2015, The Hague.

11 Grimme, W. (2011). 'The growth of Arabian airlines from a German perspective – a study of the impacts of new air services to Asia', *Journal of Air Transport Management*, 17, 333-338.

12 Dresner, M., C. Erogly, C. Hofer, F. Mendez, K. Tan (2015). 'The impact of gulf carrier competition on U.S. Airlines', *Transportation Research Part A: Policy and Practice*, in press.

4 Market Between the Netherlands and the United Arab Emirates

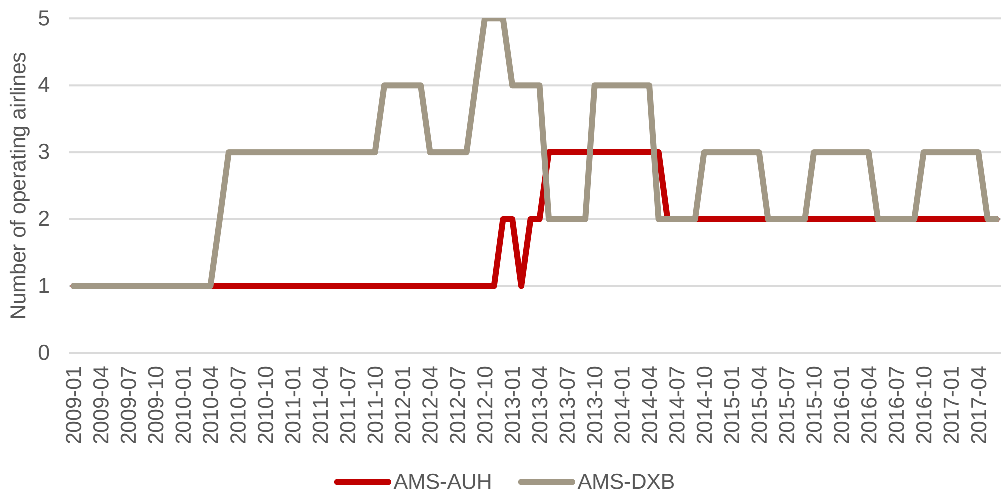
Up to 2010, KLM was the only provider of direct flights between the Netherlands and the UAE. In 2010, Emirates entered into the market to Dubai, and in 2013, Etihad commenced flights to Abu Dhabi. With two daily frequencies to Dubai, Emirates is now the biggest player in the market between the Netherlands and the UAE. The increase in supply is partly connected to the growing market demand, but the largest share of the passengers on flights between the Netherlands and the UAE increasingly consists of transfer passengers.

This chapter presents the development of the most important supply and demand factors in the market between the Netherlands and the UAE. It focuses respectively on the number of airlines in the market, the offered frequencies, the available seating capacity, offered ticket price, and, lastly, the number of passengers.

4.1 Number of Players

In the aviation market between the Netherlands and the UAE, four different players are active. KLM, Emirates and Transavia operate flights to Dubai. Between Schiphol and Abu Dhabi, KLM and Etihad are active. In 2013 and 2014, Garuda was the third active party in this market. The Indonesian airline had a layover in Abu Dhabi on its flight to Jakarta. Since the end of 2014, the number of players has remained stable (see Figure 4.1). KLM, Emirates, and Etihad offer year-round flights, and KLM subsidiary Transavia is active on the route Schiphol – Dubai during the winter season (October-April).

Figure 4.1 Since 2015, the number of players on both routes between Schiphol and the UAE remains stable



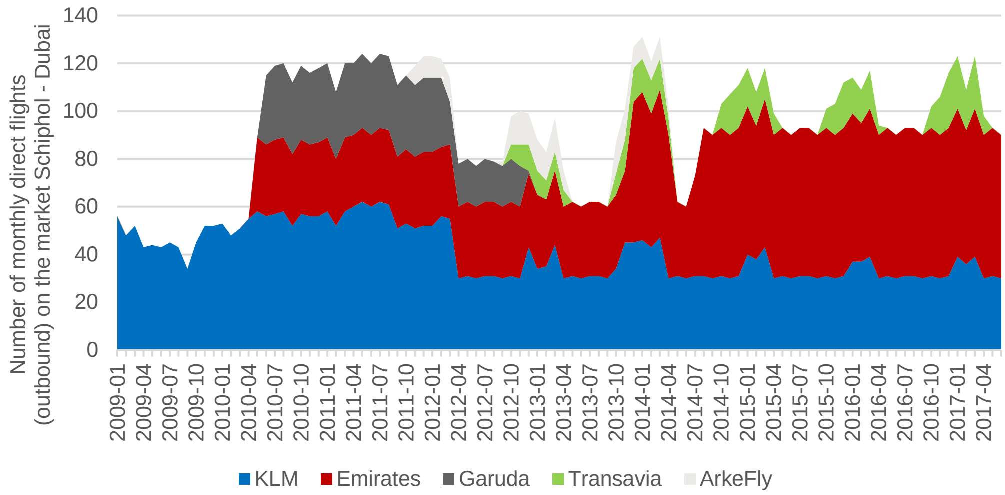
Source: Official Airline Guide (OAG), revision SEO Economic Research

4.2 Offered Frequencies

Schiphol - Dubai

Emirates operates flights fourteen times a week on the route Schiphol – Dubai. During the months of January, February, and March, KLM operates nine flights a week on these route, and during the other months one flight a day (see Figure 4.2). Transavia operates between Schiphol and Dubai during the months October through April. In the winter season of ’16/’17, this was five times a week. This is one weekly flight more than Transavia offered during the previous winter seasons, which could imply that Dubai is becoming more popular as a winter destination. Between 2010 and 2012, Garuda had a layover in Dubai on its flight between Schiphol and Jakarta. In 2012, this layover moved from Dubai to Abu Dhabi.

Figure 4.2 The number of frequencies in the market Schiphol – Dubai is stable since the end of 2014.

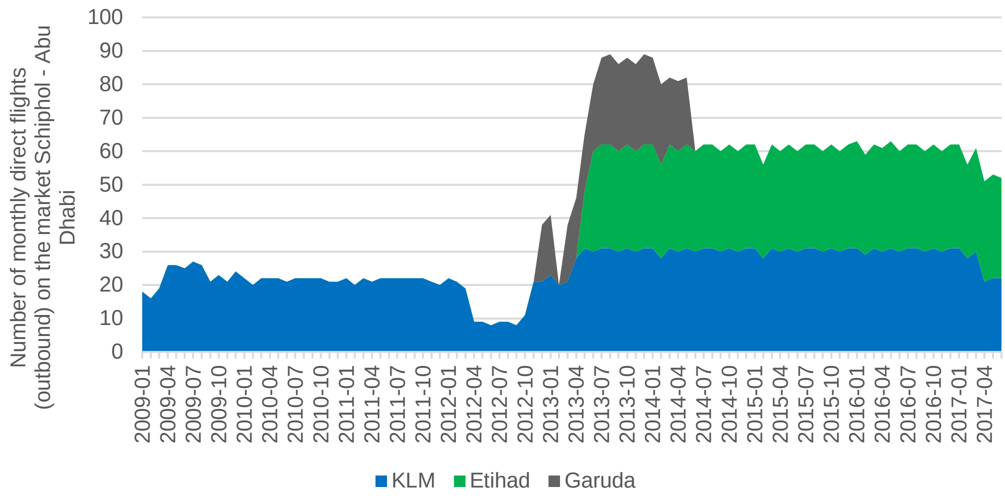


Source: Official Airline Guide (OAG), revision SEO Economic Research

Schiphol – Abu Dhabi

During the summer season of 2017, KLM lowered the number of weekly flights from seven to five (see Figure 4.3). This is part of adjustments in the flight schedule to the Middle East. The flight to Abu Dhabi previously continued to Muscat (Oman), but starting from the summer season 2017 it became a stand-alone operation, which has led to lower passenger demand. The number of flights operated by Etihad between Schiphol and Abu Dhabi remains stable, with one flight a day.

Figure 4.3 KLM lowers the number of flights to Abu Dhabi during the summer of 2017

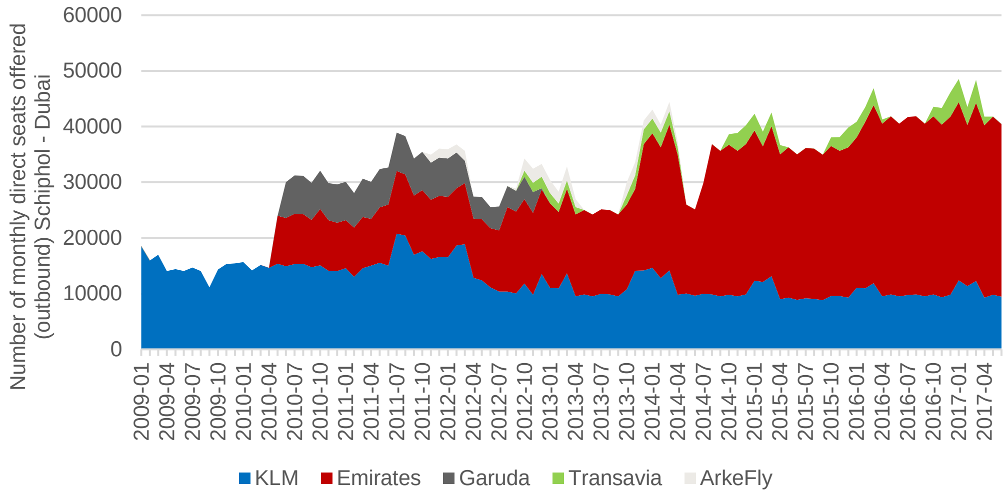


Source: Official Airline Guide (OAG), revision SEO Economic Research

4.3 Offered seating capacity

Since February 2016, Emirates operates twice a day with the Airbus A380 – offering 516 seats – between Dubai and Schiphol. Emirates' share of the total available seat capacity therefore grows to 76% from April to October (see Figure 4.4). In January, February, and March, when KLM operates 9 flights a week and Transavia operates between Schiphol and Dubai as well, Emirates' share decreases to 66% of the total available seating capacity.

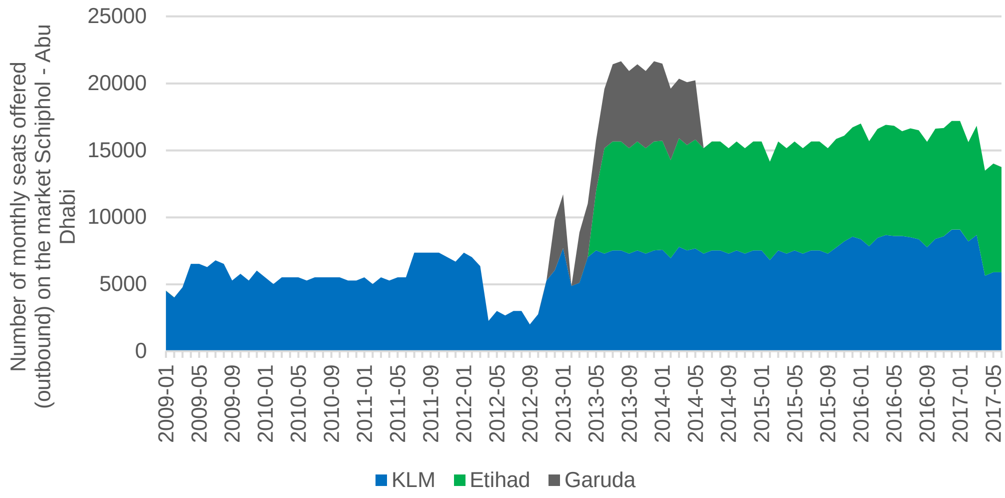
Figure 4.4 Emirates offers three quarters of the seating capacity on the route to Dubai



Source: Official Airline Guide (OAG), revision SEO Economic Research

Since June 2014, Etihad and KLM are the only airlines offering direct flights between Schiphol and Abu Dhabi. Until April 2017, both airlines had an equal share in the offered seating capacity (see Figure 4.5). After KLM lowered the number of flights to 5 per week, the share in seating capacity falls to 42%. It must be noted that part of the seating capacity was previously used for passengers continuing to Muscat, while now the total seating capacity is available to passengers travelling to Abu Dhabi.

Figure 4.5 Etihad and KLM offer a similar number of seats to Abu Dhabi



Source: Official Airline Guide (OAG), revision SEO Economic Research

4.4 Offered Ticket Prices

It is important to monitor the development of ticket prices in the market between the Netherlands and the United Arab Emirates, in order to see whether or not the increased competition affects the price, and whether there is a question of price dumping in certain cases. The analysis in this paragraph focuses on ticket prices offered by the different airlines in the market between the Netherlands and the United Arab Emirates. The data used has been collected over the course of three years in the SEO Ticket Price Monitor. Box 1 gives a detailed description of the data collection process.

Box 1: SEO Ticket Price Monitor

SEO collects the prices of plane tickets through web scraping. For this monitor, weekly data has been collected from providers of plane tickets since the start of 2014, in this case Expedia.com and Orbitz.com.

Every week, the internet robot collects ticket prices for flights from Schiphol to 30 destinations in the Middle East, Asia, and Africa, for ten different departure dates. For each departure date, the site returns a great number of different travel options. These are various options from different airlines, with varying departure times, layovers, and airports.

The data is concerned with offered ticket prices, and it is unknown whether or how often these options have been booked. In order to prevent the analyses from being disrupted by unrealistically high ticket prices, the cheapest option is considered for each combination of booking day, departure day, direct/indirect flight, and airline. It is probable that consumers will choose the cheapest (direct) option of a certain airline, particularly because for intercontinental flights in this analysis, other factors such as departure time are less important for the offered ticket prices.

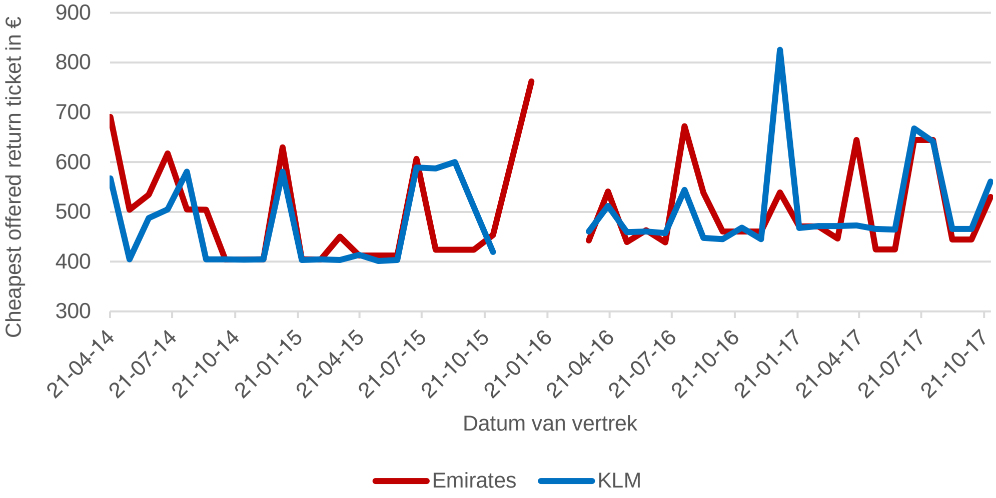
The ticket prices that are analysed in this monitor are the cheapest ticket price offered per airline, for a direct flight on a certain departure date. This provides an indication of the best ticket prices offered by different competitors. In the analysis of the beyond markets (Chapter 5), the prices for a direct option are examined for KLM, and for Emirates and Etihad the prices of an indirect flight via their respective hub airports.

In the period from 2014 to the present, we have sought to continuously collect as much ticket price data as possible. However, the number of collected data points for different departure dates may vary, because no or fewer data was collected in certain weeks due to technical problems (such as change of website, internet malfunction).

The current analysis of ticket prices may be somewhat different than the previous version of this monitor. In the previous version, the results were presented per booking data rather than per departure date. Furthermore, the previous version also presented business class rates. These have been left out in the current monitor because in certain cases, the collected data is unclear on the booking class.

The ticket prices offered by Emirates and KLM for a direct economy class flight to Dubai are at the same level (see Figure 4.6). Prices for a return ticket are generally between €400 and €600 for both airlines. Between 2014 and 2017, the offered ticket prices remain stable and a slightly rising trend is visible. The data does not provide evidence that an increase in the offer of Emirates has led to substantially lower (lowest available) ticket prices.

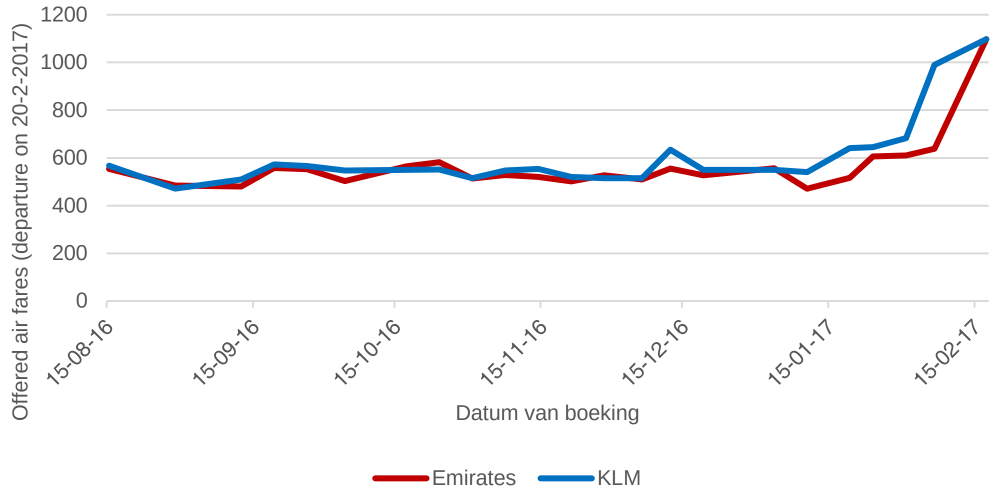
Figure 4.6 Emirates and KLM offer similar prices in the market Schiphol – Dubai



Source: SEO Ticket Price Monitor

Looking at the offered ticket prices for a certain flight, it is also found that the prices offered by both airlines are strongly similar (see Figure 4.7). Shortly before departure the ticket price rises, and it is noticeable that KLM raises the prices slightly sooner than Emirates.

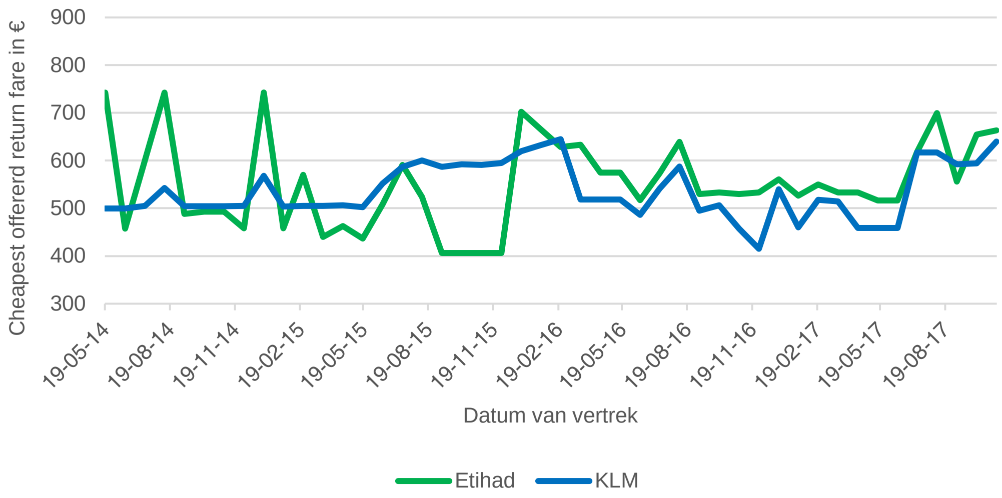
Figure 4.7 During the booking period, the prices of Emirates and KLM are similar



Source: SEO Ticket Price Monitor

In the market between Schiphol and Abu Dhabi, it is also clear that the prices offered by both airlines are on the same level (see Figure 4.8). In 2016 and 2017, the lowest ticket price offered by Etihad is a few percent higher than the cheapest rate offered by KLM.

Figure 4.8 Etihad and KLM offer similar prices in the market Schiphol – Abu Dhabi



Source: SEO Ticket Price Monitor per kilometre

In this paragraph, the offered ticket prices per kilometre in the markets to the United Arab Emirates are compared to other markets, in order to see whether the relatively large offer of capacity leads to relatively low prices per kilometre. Table 4.1, however, shows that the prices per kilometre to Dubai and Abu Dhabi are higher than to other markets in the Middle East and Asia. The prices to Abu Dhabi are slightly over 10 eurocent per kilometre, prices to Dubai are around 9.5 eurocent per kilometre. In particular for destinations that are further away, the prices per kilometre are lower, which is also connected with scale benefits and more efficient use of fuel on long-distance routes.

Table 4.1 Prices per kilometre are not remarkably low on routes to the UAE[13]

	Average Economy Price*				Price per km		
	2014**	2015	2016	Distance in km	2014*	2015	2016
DXB	€474	€462	€502	5168	€0.092	€0.089	€0.097
AUH	€514	€557	€519	5191	€0.099	€0.107	€0.100
MCT	€484	€471	€460	5514	€0.088	€0.085	€0.083
BKK	€688	€772	€775	9207	€0.075	€0.084	€0.084
HKG	€814	€861	€893	9289	€0.088	€0.093	€0.096
KUL	€763	€822	€838	10236	€0.075	€0.080	€0.082
SIN	€805	€823	€854	10513	€0.077	€0.078	€0.081
CGK	€757	€778	€812	11353	€0.067	€0.069	€0.072

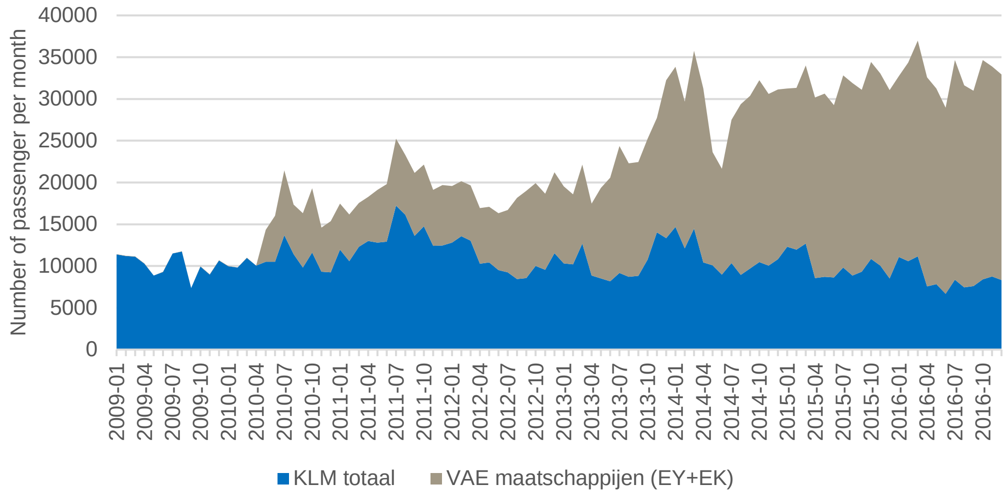
*) Average cheapest price for a return economy class ticket for a direct flight from KLM
**) 2014 data is concerned with 10 departure dates between April and December Data for 2015 and 2016 is concerned with 13 departure dates over the whole year
Source: SEO Ticket Price Monitor Realised Passenger Volumes

The number of KLM passengers on the routes between the Netherlands and the UAE has dropped between 2011 and 2016, from 160,000 in 2011 to 104,00 in 2016. At the same time, the total market

13 The results for 2014 in Table 4.1 are somewhat different from the data in that same table in the previous version of this monitor. In this version, the average cheapest ticket price between April and December was examined, while the prices in the previous monitor for this table were only concerned with the summer season. Because plane tickets are often more expensive during the summer season, the prices per kilometre for the destinations concerned are slightly lower in this version.

has increased from nearly 240,000 in 2011 to nearly 400,000 in 2016 (see Figure 4.9). Especially the number of KLM passengers in the Dubai market has reduced drastically because of the increased competition of Emirates. In the transport development of Emirates, we see the introduction of the second frequency in the summer of 2013, and the upscaling to the Airbus A380 in February 2016.

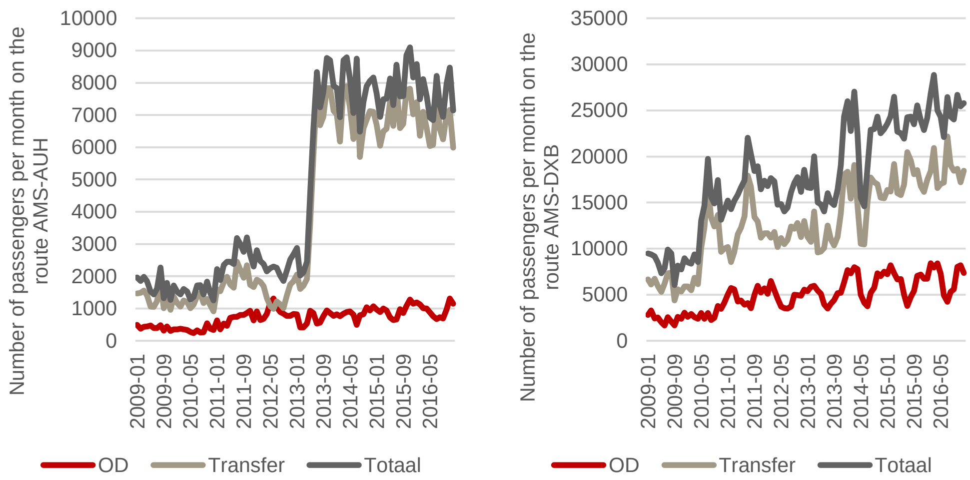
Figure 4.9 The number of passengers in the market NL-VAE has grown from nearly 240,000 in 2011 to nearly 400,000 in 2016.



Source: OAG Traffic Analyser, MIDT

Between 2011 and 2016, the total number of annual passengers on the routes between the Netherlands and the UAE has grown with 66%. Over 80% of this growth was caused by a rise of transfer passengers, travelling from Schiphol to another destination via one of the hubs in the UAE. However, the number of originating passengers has also grown substantially between 2011 and 2016, with 41% (see Figure 4.10).

Figure 4.10 On routes to the UAE, the number of transfer passengers in particular has grown significantly



Source: OAG Traffic Analyser, MIDT

5 Markets Beyond United Arab Emirates

In the last decade, Dubai and Abu Dhabi have become widely known as connecting hubs between Europe and Asia. Because of this, KLM experiences competition from Emirates and Etihad on destinations in Asia, Africa, and the Middle East. In the ten markets in which the competition from airlines from the UAE is greatest, however, KLM has upscaled its capacity. But in the last five years, KLM has lost market shares compared to the UAE airlines.

The airlines that have entered the market between the Netherlands and the UAE, not only compete on the direct route, but also on destinations that are served through a transfer at Dubai or Abu Dhabi: 30 destinations that are directly operated by KLM, are also offered indirectly by Emirates via Dubai or by Etihad via Abu Dhabi.

The analysis of this chapter examines the development of supply and demand on the ten most important overlapping beyond markets. Overlapping routes are destinations that are served directly by KLM and also by at least one of the hubs in the UAE. In the first paragraph of this chapter, the ten most important beyond markets are identified. Then, the developments in terms of seating capacity, frequency, offered ticket prices, and realised passengers volumes are presented successively.

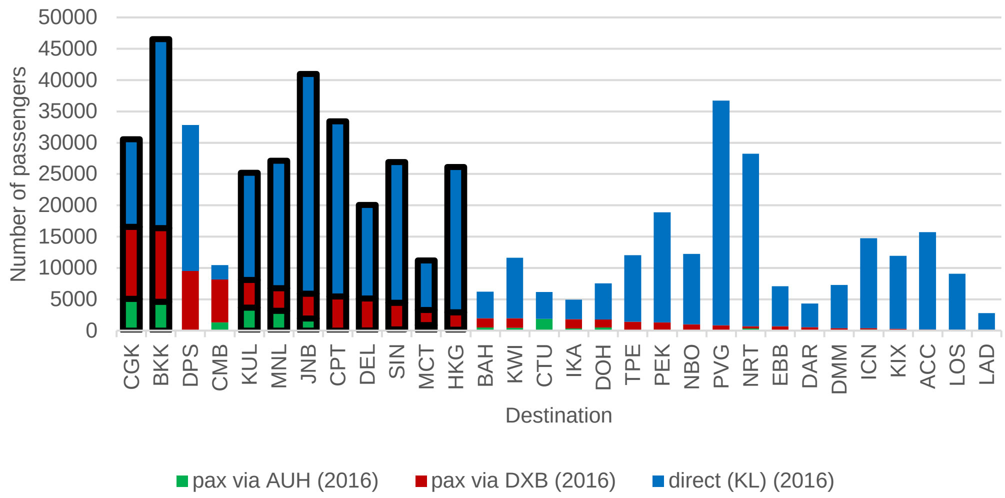
5.1 Ten Most Important Beyond Markets

In 2016, KLM experienced competition on 30 destinations in Asia and Africa from at least one of the airlines from the UAE (see Figure 5.1). The competition is greatest on flights to Jakarta and Bangkok. On both destinations, KLM transports the same number of passengers as Emirates and Etihad combined. The UAE have a convenient geographical location for these markets, which means that the extra travel time of the indirect travel option is limited. Furthermore, these are destinations that attract many non-business passengers, who are relatively more sensitive to price. The competition of Emirates and Etihad is weaker for destinations where the geographical location of the UAE is less convenient, such as Beijing, Shanghai, and Tokyo.

The analyses of this monitor focus on the ten most important beyond markets: Jakarta, Bangkok, Kuala Lumpur, Manila, Johannesburg, Cape Town, Delhi, Singapore, Muscat and Hong Kong. The ten most important beyond markets are direct KLM destinations on which the largest number of passengers travel indirectly with Etihad or Emirates. These destinations are presented by a black edge around the bar graph in the figure below. Denpasar, Bali (DPS) and Colombo, Sri Lanka (CMB) are not taken into account.[14]

[14] Colombo has only been offered since the end of 2016 (twice a week). Denpasar is executed as a tail-end operation after Singapore and is therefore not considered a direct KLM destination.

Figure 5.1 The Gulf airlines compete on 30 direct KLM destinations



Note: The ten most important beyond markets are presented with a black edge around the bar graph
Source: OAG Traffic Analyser

5.2 Offered Frequencies

The number of frequencies offered by KLM to the ten most important beyond markets remains stable on the whole (see Table 5.1). Substantial growth has occurred for Cape Town, Kuala Lumpur, and Muscat. Especially the number of flights to Kuala Lumpur has strongly increased in 2016, which seems to be a direct consequence of the discontinuation of Malaysian Airlines operations. The numbers of flights to Cape Town being scaled up from five to seven a week, coincides with the 2016 introduction of the new Boeing 787 Dreamliner that is used on this route. The increase of the number of flights to Muscat has to do with a change in KLM's Middle East operations. In 2016, the flight to Muscat is offered as a tail-end operation after Abu Dhabi instead of after Doha (a destination that KLM has recently cancelled). In 2017, the capacity changed again and Muscat is operated after Dammam in Saudi Arabia.

5.3 Offered Seating Capacity

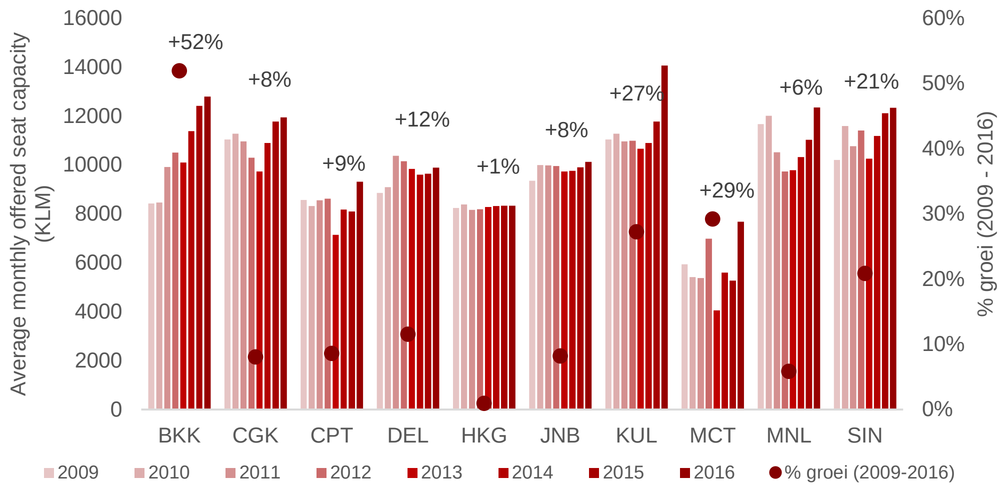
KLM's offered seating capacity has increased in all beyond markets as compared to 2009 (see Figure 5.2). Bangkok presents the strongest increase compared to 2009 (52%). This is a growth of 8,400 to over 12,000 seats per month. The increase is caused by the use of a larger type of airplane: in 2009, this was a Boeing 747 combo with a capacity of 268 passengers, but currently it is operated by the Boeing 777-300 with a capacity of 408 seats. In total, the offered seating capacity to these ten beyond markets has risen by 17%.

Table 5.1 Number of frequencies of KLM to the beyond markets remains stable on the whole

	Frequency (average per month)									
	Bangkok (BKK)	**Jakarta (CGK)**	**Cape Town (CPT)**	**Delhi (DEL)**	**Hong Kong (HKG)**	**Johannesburg (JNB)**	**Kuala Lumpur (KUL)**	**Muscat (MCT)**	**Manila (MNL)**	**Singapore (SIN)**
2009	30	30	26	30	30	30	30	24	30	30
2010	30	30	25	30	30	30	30	22	30	30
2011	30	30	26	30	30	30	30	21	30	30
2012	31	31	26	31	30	30	33	22	30	31
2013	32	30	23	30	30	30	34	16	30	30
2014	31	30	25	30	30	30	30	23	30	30
2015	30	30	25	30	30	30	30	22	30	30
2016	31	31	29	31	30	31	37	28	31	31
2017 (Jan –	30	30	30	30	30	30	42	25	30	30

Source: Official Airline Guide (OAG); revision SEO Economic Research

Figure 5.2 KLM's seating capacity has increased to all beyond markets since 2009



Source: Official Airline Guide (OAG); revision SEO Economic Research

5.4 Offered Ticket Prices

For the ten beyond markets in general, no trend developments are visible in the offered ticket prices (see Table 5.2).

Prices for flights via the hubs in the UAE are lower than the prices for direct KLM options. This reflects the passengers' decreased willingness to pay for indirect flights, due to the longer travel time and the hassle of a transfer. Most notable is the drop in prices to Delhi, for KLM -12%, which presumably has to do with the entry of Jet Airways to Schiphol in 2016. The prices of Emirates and Etihad have also dropped in the Delhi market.

To Bangkok, the prices of KLM and Emirates are one the same level in 2015 and 2016. Etihad shows a small price increase. The prices in 2017 are higher for KLM and Etihad, but this is primarily caused by high offered ticket prices for flights during the summer. The same effect is visible in the offered ticket prices to Jakarta and Kuala Lumpur.

Another striking development is the price increase of KLM for the flight to Singapore, while the prices of Emirates and Etihad are dropping in the same period. Because this is primarily a business destination, many travellers to Singapore prefer the direct option over the indirect options offered by Emirates and Etihad.

Table 5.2 Prices for flights via the hubs in the UAE are lower than direct KLM options

	Bangkok (BKK)			Jakarta (CGK)			Cape Town (CPT)			Delhi (DEL)			Hong Kong (HKG)		
	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH
2014*	688	611	662	757	638	695	1185	825	-	674	652	586	814	690	
2015	772	563	545	778	557	563	1172	677	-	719	538	545	861	611	694
2016	775	564	570	812	565	571	1284	670	-	635	497	497	893	633	663
2017*	905	555	638	910	570	651	1079	640	-	614	526	564	959	603	686
% difference 15-16	0%	0%	5%	4%	1%	1%	10%	-1%	-	-12%	-8%	-9%	4%	4%	-4%

	Johannesburg (JNB)			Kuala Lumpur (KUL)			Muscat (MCT)			Manila (MNL)			Singapore (SIN)		
	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH	KLM	EK via DXB	EY via AUH
2014*	1048	663	706	763	602	669	484	519	539	853	737	842	805	644	759
2015	904	601	603	822	566	554	471	454	434	940	696	720	823	623	657
2016	918	593	587	838	553	582	460	427	408	934	694	711	854	581	600
2017*	907	572	679	973	589	659	552	453	436	985	621	699	984	582	646
% difference 15-16	2%	-1%	-3%	2%	-2%	5%	-2%	-6%	-6%	-1%	0%	-1%	4%	-7%	-9%

*) 2014 and 2017 based on data collected between April 2014 and February 2017. Average prices for these years cannot be directly compared because certain months/seasons are over or underrepresented.
Source: SEO Ticket Price Monitor

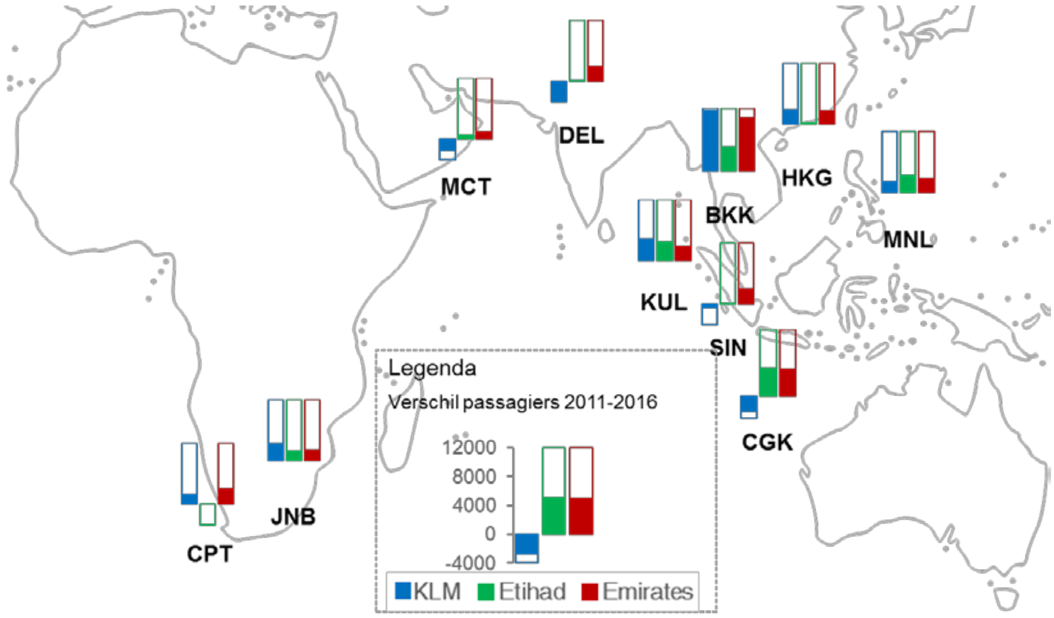
5.5 Realised Passenger Volumes

Between 2011 and 2016, the number of passengers annually travelling via the UAE to the ten most important beyond markets has grown with over 55,000 (+285%), against a growth of over 16,000

KLM passengers (+8%) on these destinations in the same period (see Figure 5.3).[15] KLM's seating capacity to the ten beyond markets has increased with an average of 17% between 2011 and 2016. This indicates that the share of transfer transport has grown for KLM on these routes.

With regard to the number of passengers, the market between Schiphol and Bangkok has experienced the strongest growth. Between 2011 and 2016, the number of KLM passengers grows by nearly 12,000 (+12%), while the number of annual passengers of Emirates and Etihad increases by 10,000 and 4,500 respectively. For Emirates and KLM, this is the largest growth market. For Etihad, the market that has shown the greatest growth is Jakarta, with over 5,000 passengers. The number of passengers of Emirates to Jakarta has also increased strongly. In this market, the number of passengers for KLM decreases by 16% (from over 16,500 in 2011 to 14,000 in 2016). In 2016, the number of passengers travelling to Jakarta are approximately equally divided between KLM and Emirates. In three other beyond markets KLM furthermore saw an absolute decrease in the number of passengers: Delhi[16] (from over 18,500 in 2011 to 15,000 in 2016), Muscat (from over 10,000 in 2011 to nearly 8,000 in 2016), and Singapore (from more than 23,000 in 2011 to 22,500 in 2016).

Figure 5.3 The number of passengers travelling to KLM destinations via the UAE has increased



Source: OAG Traffic Analyser

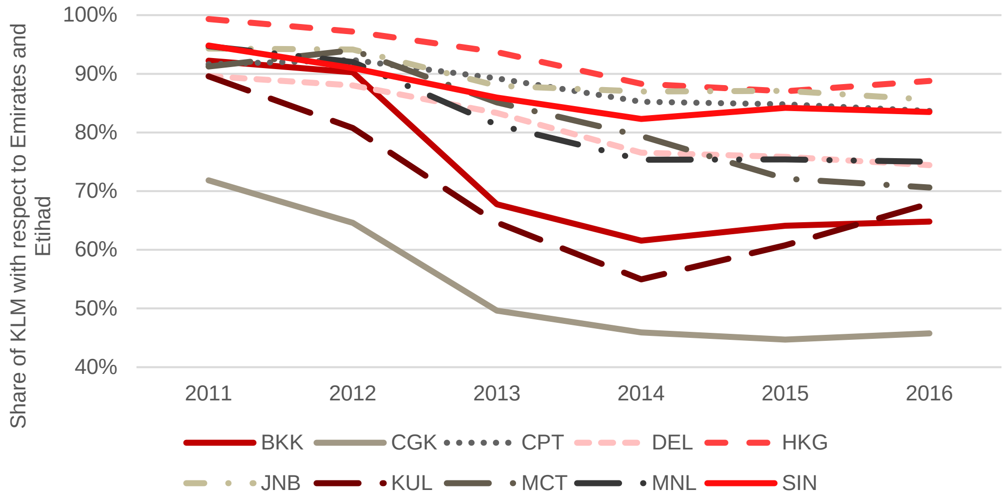
15 Compared to the previous monitor, the analysis has been slightly modified with regard to transport volumes. For KLM, the previous version took into account all passengers that were transported on the flight between Schiphol and the relevant beyond market, considering the passengers who departed from Schiphol as well as transfer passengers who travelled via Schiphol to their relevant destinations. For airlines from the UAE, the analysis only took into account the origin-destination passengers between Schiphol and the beyond market in question. In order to come to a better comparison, this version only regards the origin-destination passengers who travel between Schiphol and the relevant beyond market for KLM as well. Because of this, the market shares for KLM in Figure 5.4 are lower than in the comparable figure of the previous version.

16 In addition to Emirates, KLM also lost passengers to Jet Airways in the Delhi market, which caused a drop in the total number of passengers travelling to Delhi with KLM, Emirates, and Etihad as compared to 2011.

Compared to the airlines from the UAE, KLM's market share has decreased in all beyond markets compared to 2011 (see Figure 5.4). As noted earlier, four of the ten examined beyond destinations also present an absolute decrease of the number of KLM passengers. The drop in KLM's market share is greatest for Bangkok, but Jakarta and Kuala Lumpur also show a significant decrease. KLM's share in the market to Kuala Lumpur has risen as compared to 2014, which is related to an increase in the number of flights after Malaysia Airlines discontinued its operations.

The impact of the competition from Emirates and Etihad on KLM's market share is the lowest in the markets to Johannesburg and Cape Town, for which the UAE's geographical location is inconvenient. The decrease of KLM's market share is also limited in the Singapore market. Due to the business nature of this destination, many passengers prefer a direct flight over a cheaper indirect alternative via the UAE.

Figure 5.4 Share of KLM in the beyond markets decreases compared to the UAE airlines.



Source: OAG Traffic Analyser

6 Econometric Analysis

An increasing market share of airlines from the UAE does not always lead to lower ticket prices, as is apparent from an econometric analysis of ticket prices on 67 destinations in the Middle East, the Far East, and Africa. In the ten most important beyond markets, a growing market share of Emirates does lead to a drop in ticket price. When an airline holds a dominant position on destinations in a certain world region, an increase of market share will lead to higher ticket prices.

In addition to a descriptive analysis of factors related to supply and demand, this research also entailed an econometric analysis in order to draw general conclusions about the effect of a growing market share of UAE airlines on the price of plane tickets.

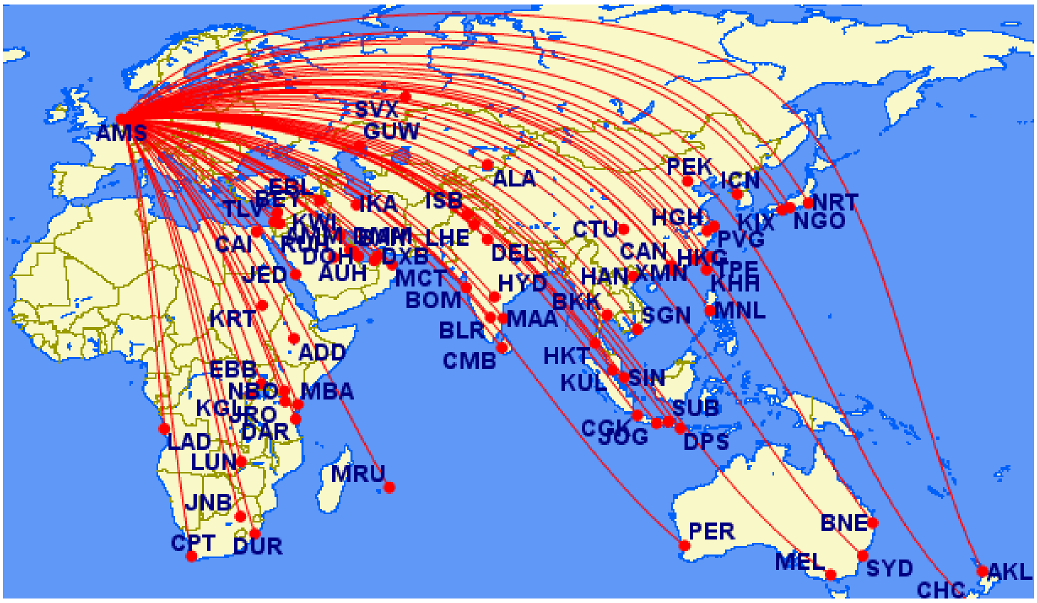
The general perception is that increasing competition – by Arabian Gulf airlines, among others – will lead to lower ticket prices. However, according to economic theory, this effect depends on the current market position: if an airline has a limited market share, an increase of that market share will have a negative effect on the price; while an increase of market share will often lead to price increase when the airline in question already holds a relatively dominant position. This analysis shows that this also applies to markets in which airlines from the Netherlands and the UAE are competing: in general, an increase of the market share of both KLM and Emirates will lead to higher ticket prices. Only in markets in which the competition is strongest – i.e. markets that are served directly by KLM but in which Emirates also holds a substantial share – will an increase of Emirates' market share lead to lower prices on average.

6.1 Data

Unlike previous chapters, this analysis is based on a large collection of relevant markets in which airlines from the Netherlands and the UAE potentially compete. To this end, it examines all destinations in Asia, Australia, and Eastern and Southern Africa where, between 2011 and 2016, more than 500 passengers travelled from Schiphol in at least one month.

This analysis makes use of price data from booked tickets, provided by OAG Traffic Analyser (see Box 2). In the period of the analysis (2011–2016), monthly price data is not available for all markets; the analysis therefore focuses solely on the markets for which ticket prices are available for all 72 months. This has resulted in the 70 origin-destination markets represented in Figure 6.1.

Figure 6.1 The ticket price analysis examines 70 OD markets from Schiphol



Source: gcmap.com

Box 2: MIDT data (OAG Traffic Analyser)

The ticket price data and information derived from passenger data (competition level and market share) that are used in this analysis, were taken from Marketing Information Data Transfer (MIDT), as made available by Official Airline Guide (OAG) in the so-called Traffic Analyser module.

This source presents on a monthly basis the average ticket price between a certain origin and destination, excluding tax, fees, or other earnings. MIDT data is collected from Global Distribution Systems (GDS). Only part of the bookings is done through a GDS, and this portion strongly varies per market. The data does not comprise tickets that are booked directly from airlines. OAG adjusts the passenger numbers with the help of an algorithm. Ticket price data is not adjusted, which means that the data presents many missing values. Approximately 40% of the market is covered.

In order to ensure reliability of the analysis, this analysis is performed on the level of the origin-destination market, not on individual airline level. The conclusions therefore relate to the average booked price in the markets in question, not to the price of individual airlines.

This ticket price data is different from the data derived from SEO's Ticket Price Monitor (see Box 1). The data in this analysis includes the average price of actually booked tickets, while the data from the ticket price monitor does not show how many tickets are bought at what price. Because of the limited coverage of the data from the OAG Traffic Analyser, this data is less suitable for a market specific analysis as described in the previous chapter, but more suitable for general analyses such as presented in this chapter.

The analysis is based on 5040 observations, where each observation consists of one origin-destination market in one specific month. The 70 origin-destination markets involve 1.8 million return passengers, on average 2180 annual passengers per market.

In order to measure the influence that the market share of certain airlines has on the ticket price, corrections must be made for other factors that may influence the price. This analysis makes corrections for the following factors:

- Degree of competition in the relevant origin-destination market, measured in HHI[17];
- Degree of competition on the destination airport concerned, measured in HHI based on the number of passengers per airline on the airport;
- Kerosene price;
- Market share of KLM, Emirates, and Etihad in the origin-destination market in question;
- Population and GDP per capita, as proxy for market demand.

6.2 Descriptive Analysis

The factors that may influence ticket prices differ for specific market segments (see Table 6.1). The results are therefore presented separately for the whole sample, the ten markets that are specifically discussed in Chapter 5 ("Markets Monitor") and broken down into the four destination regions of Africa, Middle East & Central & South Asia, Northeast Asia, and Southeast Asia & Oceania.

On the 70 routes offered from Schiphol that are examined in this analysis, KLM has an average market share of 34%. The average market share of Emirates is 10%, and Etihad's is 2%. This is in line with an earlier analysis, which shows that Emirates is a larger party than Etihad from Schiphol. On the routes that are further discussed in this monitor, the share of Emirates is slightly lower (8%), while KLM's share is 44% on average. This can be explained by the fact that the monitored routes are concerned with direct KLM destinations with competition from Emirates and/or Etihad. Due to the presence of a direct alternative, the market share of KLM is larger. For the other variables, the characteristics of the monitored routes seem largely consistent with the characteristics of the 70 origin-destination markets examined in the econometric analysis.

The data does not show strong regional differences. The competition level in the origin-destination markets to Southeast Asia and Oceania is significantly higher than on the other routes. This is partly due to the fact that 65% of these routes do not have a direct alternative, which means that there is no single airline which holds a dominant position. The market share of the UAE airlines on these destinations is therefore higher than the average of all markets, while the share of KLM is lower. Emirates has the largest average market share to destinations in the Middle East & Central & South Asia. This is partly due to a large market share on destinations that are not directly served by KLM (for instance Hyderabad in India), and due to a large market share in the market between Schiphol and Dubai.

17 Herfindahl-Hirschman Index (HHI) is a common tool for measuring competition. The index is reached through the sum of the squared market shares of all actors in a certain market. The HHI is a value between 0 and 1. A value of 1 indicates a monopoly market; lower values are markets with more competition. In the case of two competitors with an equal market share, the HHI is equal to 0.5.

Table 6.1 A range of variables can influence the ticket price

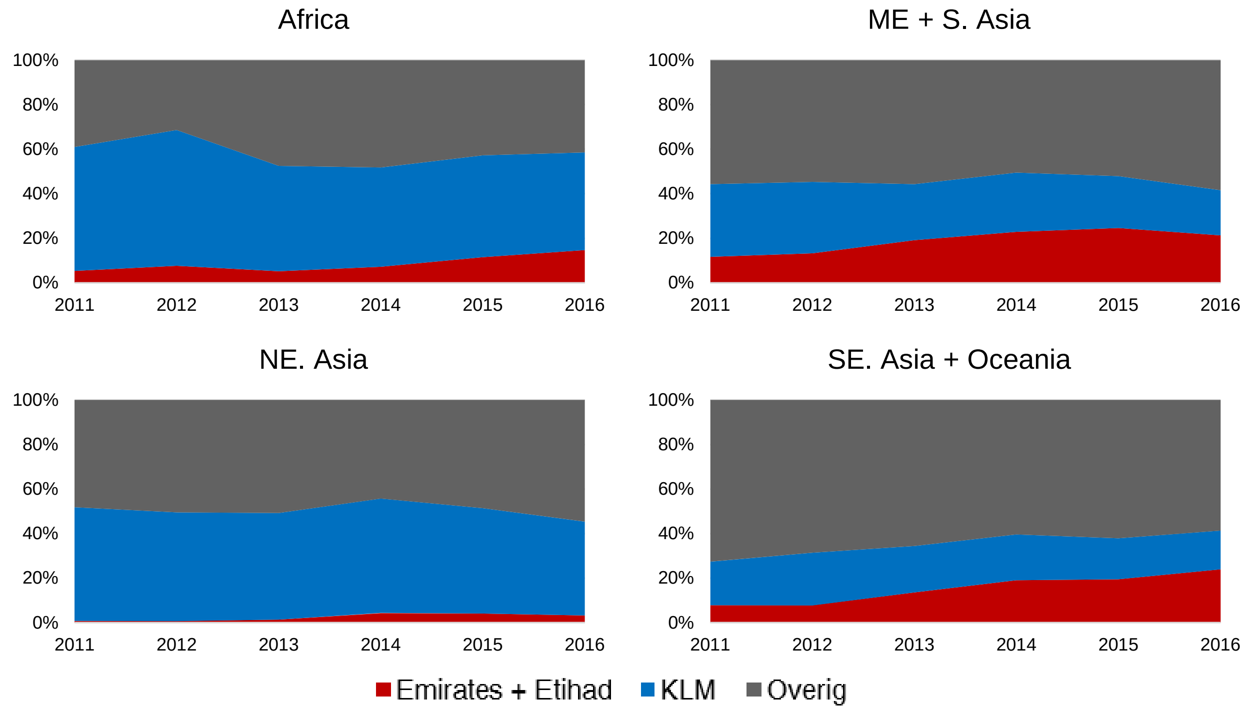
	All routes	Markets monitor	Africa	Middle East & Central & South Asia	Northeast Asia	Southeast Asia & Oceania
Sample averages:						
Ticket price (one-way economy, €)	427	406	427	384	455	462
HHI OD market	0.40	0.34	0.48	0.42	0.47	0.26
HHI destination	0.19	0.15	0.23	0.19	0.13	0.22
Kerosene price ($ per kg)	2.41	2.41	2.41	2.41	2.41	2.41
Market share Emirates	10%	8%	8%	15%	1%	12%
Market share Etihad	2%	3%	0%	3%	1%	4%
Market share KLM	34%	44%	50%	27%	48%	20%
% direct alternative	61%	100%	67%	65%	77%	35%
Distance in km	8139	9155	7140	5255	8597	12713
GDP per capita ($ per capita)*	16,825	15,079	3,132	17,771	20,268	24,623
Population (millions)*	6.9	10.8	4.6	5.7	13.7	4.9
Number of observations	5040	720	1080	1728	1008	1224
Number of OD markets	70	10	15	24	14	17

* : some missing observations; data based on non-missing observations
Source: SEO with the help of various sources

Figure 6.2 zooms in further on the development of the Etihad and Emirates market shares compared to KLM on the different destination markets. In all market segments, the market share of the UAE carriers is growing. The largest increase (+16 percentage point compared to 2011) is visible on destinations in Southeast Asia and Oceania. On the other hand, KLM's market share in this segment also remains more or less stable in this period: a 2 percentage point drop compared to 2011, the slightest decrease of the four market segments. Especially other airlines have lost market shares on the routes to Southeast Asia and Oceania, among which Malaysia Airlines, Singapore Airlines, Cathay Pacific, and China Airlines. On destinations to Northeast Asia (China, South Korea, and Japan) airlines from the UAE play a smaller part because of their inconvenient geographical location. To Africa and the Middle East & South & Central Asia, the combined market share of Emirates and Etihad increases with respectively 9 and 10 percentage points compared to 2011. KLM's market share in both of these market segments drops by 12 percentage points in this period.

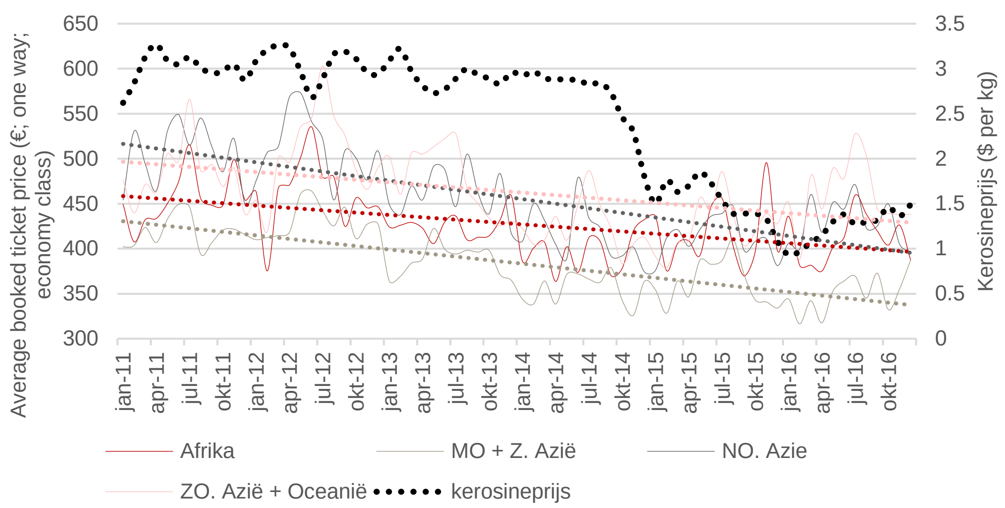
During the same period in which KLM's market share dropped and the share of the UAE airlines increased, the average booked economy class prices have decreased by 12% (see Figure 6.3). The question remains whether this entails a causal relationship, or whether other factors play a part. A possible factor is the dropping kerosene price, which has decreased by 43% in the same period. This is most likely related to 'hedging' when airlines purchase fuel beforehand in order to safeguard against fluctuation of kerosene prices.

Figure 6.2 KLM's market share decreases in all market segments.



Source: OAG Traffic Analyser, revision SEO

Figure 6.3 Between 2011 and 2016, booked ticket prices have decreased by 12%.



Source: OAG Traffic Analyser

6.3 Results Econometric Analysis

The econometric analysis shows that Emirates' increasing market share does not have an unequivocal effect on the average offered ticket prices (see Table 6.2). An increase of 10 percentage points in Emirates' market share will lead to a price increase of 2.8% on average over all analysed markets. This indicates that, on certain routes, both Emirates and KLM can use their strong market positions to ask higher prices. A similar analysis has been performed for Etihad, but in that case the analysis does not show any significant effect.

An analysis of the ten most important beyond markets specifically focused on in this monitor – direct KLM routes with strong competition from the Gulf airlines ("Markets Monitor") – shows an opposite effect. When the market share of Emirates increases on these routes, the average booked ticket price drops. On these routes, an increase of competition from Emirates has indeed led to a lowering of ticket prices. In these markets, Emirates holds an average market share of 8%, against an average KLM market share of 44%. An increase of Emirates' market share will therefore lead to a less dominant position of KLM in these markets, which explains a drop in the ticket price.

Table 6.2 Increase of Emirates' market share does not have an unequivocal effect on price

	Impact 10 percentage point increase market share Emirates on ticket price	**Impact 10 percentage point increase market share KLM on ticket price**
All routes	2.8%	1.9%
Markets monitor	-4.5%	6.1%
Africa	0.0%	3.1%
Middle East & Central & South Asia	3.4%	2.9%
Northeast Asia	0.0%	0.0%
Southeast Asia & Oceania	0.0%	0.0%

Source: SEO Analysis

Analyses on specific market segments show that a change in the market share of Emirates does not have a significant effect on the price for destinations in Africa, Northeast Asia, and Southeast Asia and Oceania. In markets to the Middle East & Central & South Asia, Emirates can use its relatively dominant market position to ask higher prices when the market share increases. Emirates holds a dominant position on many of these destinations, especially when KLM does not offer direct flights here. A further increase of the market share will often be accompanied with rising ticket prices. A similar effect is demonstrable in markets in which KLM holds a dominant position, in Africa and the Middle East & Central & South Asia. For destinations in the Far East, the analysis does not present a significant effect of increasing market shares of either Emirates or KLM on the booked ticket price.

7 Conclusions

Between 2009 and 2017, Emirates and Etihad have experienced a strong growth in the market between the Netherlands and the UAE. Both on flights to Abu Dhabi and Dubai, but also on destinations that are offered indirectly via these hubs, Emirates and Etihad have acquired an important position. As a result, KLM has lost market share on flights to the UAE and other destinations in the Middle East, Asia, and Africa. Nevertheless, this competition has not led to a decrease of KLM's offer to these destinations. Ticket prices of the different providers are on a similar level and are not notably low compared to other destinations.

- This monitor study shows that the market position of UAE airlines, and Emirates in particular, has become stronger during the last years. Dutch airlines are hindered by this compared to the years before 2009, when they were the sole provider in the direct market between the Netherlands and the UAE. They have seen a decline in market share, and the growing competition has led to a downward pressure on ticket prices. In absolute terms, the number of KLM passengers in the Dubai market has also decreased: from nearly 130,000 in 2011 to over 67,000 in 2016. Despite this fact, the flight offer has not been reduced. This implies that KLM increasingly fills up its airplanes in the Dubai market with transfer passengers. The absolute number of KLM passengers in the Abu Dhabi market is higher in 2016 (over 36,000) than in 2011 (nearly 31,000).[18] (Dutch) Consumers benefit from competition in the markets in question through improved connectivity and lower ticket prices.
- The market share of the UAE airlines on flights to the Middle East has increased. In the market between Schiphol and Dubai, Emirates offers three quarters of the seating capacity. Etihad covers over half of the number of available seats in the market to Abu Dhabi.
- Emirates and Etihad also compete with KLM by offering destinations in Asia, Africa, and the Middle East via their hub airports. This competition is strongest for the following KLM destinations; Jakarta, Bangkok, Kuala Lumpur, Manila, Johannesburg, Cape Town, Delhi, Singapore, Muscat and Hong Kong. For these destinations, KLM has lost market share to airlines from the UAE. However, for six of the ten destinations, KLM transported more passengers in 2016 than in 2011.
- The offered ticket prices are on the same level for the competing parties. Compared to the prices offered in other markets, these offered prices are not notably low. On direct KLM destinations that are indirectly served by Emirates and Etihad, the prices are on a similar level as well. When indirect flights entail longer travel time due to detours and lay-over time, this is compensated by offering lower ticket prices. There are no indications of price dumping by UAE airlines.

An increase of Emirates' market share does not lead to lower ticket prices in all cases. On destinations that have no competition of direct flights, Emirates – as well as KLM – can raise the ticket prices when the market share increases. On destinations where KLM offers a direct flight and Emirates is competing, an increase of Emirates' market share will lead to a price decrease in the market concerned.

[18] In 2014 and 2015, however, KLM transported more passengers on the Abu Dhabi route than in 2016.

Appendix A Econometric Analysis

An econometric analysis has been performed in order to measure the effect of an increasing market share of airlines from the United Arab Emirates on booked ticket prices. This appendix offers a detailed description of the econometric analysis.

The data consists of monthly observations of origin-destination markets between January 2011 and December 2016, including the average booked ticket price as well as a collection of explanatory variables. The variables used are defined in Table A.1. Here, we follow the existing scientific literature in the field.[19]

In an economic context, the interaction between price and demand is important to take into account. Because the price influences demand, but demand also influences the price, demand is an endogenous variable that cannot be included in the regressions. A possible solution is to use instrumental variables for demand, and solve the two structural equations, for example with the help of 2SLS. However, finding the right instrumental variables poses a problem in this case, because they must be correlated to demand, but not to price. An alternative is to solve the so-called 'reduced form' equation, in which certain variables that relate to demand and not directly to price, are included in the regression equation. In this case, we have used the Gross National Product (GNP) of the country of destination and the population size in a radius of 100 km around the destination airport. The hypothesis is that the market demand will increase when the population and/or the GNP increases.

The relationship between ticket price and market share / degree of competition is the result of a strategic game between airlines. This strategic game can be influenced by certain indicators that cannot be included in the regression equation, such as loyalty programmes, marketing campaigns, or other unobserved consumer preferences. In order to make corrections for potential endogeneity of the competition degree, we use a 2SLS model where we use the competition degree of the previous year as instruments, analogous to the analysis of Bilotkach and Lakew.19

Another econometric challenge is the potential correlation between the market share of the three airlines and the competition degree on route level. For the used indicator – HHI – is defined as the sum of the squared market shares. However, the correlation between KLM's market share and the HHI is 0.55 and lower for Emirates and Etihad, which means that this does not pose problems in the current estimates.

19 V. Bilotkach & P. A. Lakew (2014). 'On sources of market power in the airline industry: Panel data evidence from the US airports', *Transportation Research Part A*, 59 (288-305).

Table A.1 List of variables

Variable	Description	Source
P_{it}	Average booked ticket price	OAG Traffic Analyser
HHI_{it}^{OD}	Competition level OD market, measured in HHI based on market share per airline	Own calculation based on OAG Traffic Analyser Data
$HHI_{it}^{airport}$	Competition level airport, measured in HHI based on the percentage of passengers per airline on the airport in question	Own calculation based on OAG Traffic Analyser Data
MS_{it}^{XX}	Market share of airline *XX* on the origin-destination market in question	Own calculation based on OAG Traffic Analyser data
$FUEL_t$	Kerosene price (A1 jet fuel in US$ per kg)	Indexmundi.com
$DIRECT_{iT}$	Dummy with value 1 if there is a direct flight to the destination in question	Own calculation based on OAG Traffic Analyser
GDP_{it}	Gross National Product per capita in country of destination	IMF World Economic Outlook database
POP_{it}	Population in a radius of 100 km around the airport	United Nations

The data set contains repeated observations for the same origin-destination markets and is therefore so-called panel data. Two standard models can be used for analyses of panel data: 'random effects' and 'fixed effects'. The Hausman Test indicates that 'fixed effects' should be used in this case. The 'fixed effects' model determines a specific constant (υ_i) for each market, which captures all market specific characteristics that do not vary over time. An example of such a characteristic is the distance between origin and destination, which is an important explanatory variable for the ticket price. The following model is estimated:

$$P_{it} = \beta' x_{it} + \upsilon_i + \varepsilon_{it}$$

Where x_{it} is the vector of variables that vary over time:

$$x_{it} = (HHI_{it}^{OD}, HHI_{it}^{airport}, MS_{it}^{EK}, MS_{it}^{EY}, MS_{it}^{KL}, DIRECT_{it}, GDP_{it}, POP_{it}, FUEL_t, EXRATE_t)$$

Of all variables, with the exception of the market shares, HHI's and dummy variables, natural logarithms have been used in order to improve the quality of the estimate. The regression coefficients can therefore be interpreted as elasticities. Table A.2 presents the regression results for the whole set of routes, as well as partial results for the 10 most important beyond markets according to this monitor, and separate results for four destination regions. The most important conclusions that arise from these results are identified in the main text.

Table A.2 Regression Results

	All routes	Markets monitor	Africa	Middle East & Central & South Asia	Northeast Asia	Southeast Asia & Oceania
HHI OD market	0.03	-0.7354***	0.0713	0.0597	0.0098	0.2580**
HHI destination	0.1857	1.8438***	0.2015	-0.0107	1.0176	1.0114***
Kerosene price	-0.0188	-0.0484	-0.0476	-0.0198	-0.0228	-0.0079
Share Emirates	0.2779***	-0.4470***	0.0908	0.3437***	0.1601	-0.0679
Share Etihad	-0.0479	-0.1396	-0.814	-0.0377	-0.0782	-0.0908
Share KLM	0.1929***	0.6114***	0.3079***	0.2863***	0.0419	0.045
Direct alternative	0.0505**	(omitted)	0.0036	0.0789**	-0.0981	(omitted)
GDP per capita	0.0506*	0.0313	-0.0512	-0.0203	0.5472***	-0.0416
Population	0.024	-1.1017***	0.8177**	0.1435	-1.3757***	-0.3239*
Year dummies (2011 = Base)						
2012	0.015	0.0018	-0.0355	0.0294	0.0093	0.0464**
2013	-0.0719***	-0.023	-0.1036**	-0.0893***	-0.0640**	0.019
2014	-0.1757***	-0.0803**	-0.1963***	-0.1812***	-0.1650***	-0.0807***
2015	-0.1636***	-0.0657	-0.2056***	-0.1555***	-0.1537***	-0.066
2016	-0.1542***	0.0015	-0.2491**	-0.2053***	-0.0928	0.0337
Month dummies (January = Base)						
February	-0.0238	-0.0191	-0.0837**	0.0013	0.0525	-0.0773***
March	0.0366**	0.0754***	-0.0257	0.0615**	0.0969***	0.0132
April	0.0097	0.0274	-0.0605	0.0391	0.0512	0.0061
May	0.0707***	0.0669***	-0.0286	0.1200***	0.1183***	0.0581**
June	0.0915***	0.0658***	0.044	0.1236***	0.1290***	0.0701***
July	0.1245***	0.0421*	0.0877**	0.1476***	0.1065***	0.1773***
August	0.0674***	0.0273	0.0256	0.1103***	0.0830**	0.0664***
September	0.0282*	0.0083	-0.0709*	0.1066***	0.0407	0.0176
October	0.0117	0.0088	-0.0372	0.0518**	0.0513	-0.0165
November	0.0175	0.0236	0.0246	0.0352	0.0308	-0.0086
December	0.005	0.0440*	-0.0189	0.0546**	-0.019	0.0098
R^2 ('within')	0.1759	0.3348	0.1715	0.2253	0.2563	0.2492
Number of observations	4721	710	982	1609	994	1136
Number of markets	67	10	14	23	14	16

Source: SEO Analysis
Note: Significance: * = p < 0,1, ** = p < 0,05; *** = p < 0,01