UNIVERSITAT POLITÈCNICA DE VALÈNCIA

Escuela Técnica Superior de Ingeniería del Diseño

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NUEVOS MODELOS DE NEGOCIO EN EL AMBITO DE LA AVIACIÓN COMERCIAL. EL MODELO LONG TAIL.

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Abstract

This thesis examines whether the Spanish airline Volotea follows a business model different from those defined in the literature, by using a comparative assessment of parameters.

In the first place, the literature review is presented to provide some context to the subject of research. This includes both an explanation of what a business model is and what it is useful for; as well as the main commercial aviation business models.

Then, the choice of business models considered relevant to the comparison is justified. Additionally, the airlines chosen to represent each of these business models and the parameters used to categorize or measure the characteristics of each airline are examined.

The results include the comparison of the airlines as the different parameters are analysed. These suggest that Volotea's operations are indeed substantially different. Its search of economies of scope in the operation of a significant amount of low-demand routes, rather than the focus in high traffic markets, provides it a name found in the field of business model studies: the Long Tail business model in aviation.

Keywords: Business Model; Long Tail; Air Transport; Commercial Aviation; Airline.

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Scope and Approach

After reviewing the existing literature with the purpose of coming up with a theme for the present research thesis, it became evident that there was a gap between recent innovation in the reality of the airline business and the existing research literature.

The underlying topic of this thesis therefore rose as a need to characterise the actual diversity of business models in the airline industry, which, far from the Differentiation–Cost Leadership dualism that traditionally characterized the industry, is now full of a diversity of business models that have not yet been properly identified.

Within the variety of airlines following these diversity of business models is Volotea. Volotea is a Spanish airline that was founded in 2012 by Carlos Muñoz and Lázaro Ros, who founded Vueling aswell. In its website, the airline states that it connects small and medium sized European cities with non-stop direct flights at very competitive prices. Adding, "We want you to spend more time at your destination and less time on the plane". And claim to cater for the individual instead of following the crowd.

This is actually what stands out from the airline's operations the most: although it has been repeatedly referred to as a Low-Cost airline, Volotea literally does not follow the crowd. The airline offers budget-friendly prices and flies to 89 destinations but offer however a low amount of flights per week.

Volotea therefore also contains Regional Carrier tinges, as it operates small and mid-sized cities, but it does so with medium-sized airliners. However, it stands out too, that the airline not just flies within a fixed region, but has its operations spread all over Europe.

In short, the initial hypothesis of the present thesis is that Volotea does not strictly following any of the business models described in the literature.

Given this premise, the purpose of this paper sets to study whether it can be considered that Volotea follows a new business model that has not yet been described in the Literature. This will be done by comparing it with the existing business models and analysing whether there is a substantial difference between its parameters as a whole, that leaves the airline at a different, new category.

The paper will be structured as follows. In the first place, the term *business model* will be defined and differentiated from that of strategy. It is essential to clarify the concept of business model, as the purpose of this paper is not just to classify a given airline into a business model type, but to identify this business model as a potentially powerful tool. Innovation in the business structure of a company – an airline in this case – can be a game changer in catapulting it, without necessarily counting on new technology.

Next, the concept of business model will be put into context within the field of the airline industry: a background on existing airline business models will be given. These include the Full-Service Carrier (FSC); the Low-Cost Carrier (LCC), together with its long-range variant and the concept of Hybrids; and the different types of Regional Carriers - the Feeder type and the Bounded Regional.

The chapter that follows will describe the methodology to be followed to find an answer to the research question. As already stated, this will be done by comparing the staging of Volotea with that of other airlines which belong to other defined business models.

To do so, the characteristic parameters of an airline's operation will be compared throughout all airlines observed. Such parameters will be defined in this chapter as well as the conditions under which the data required for the studies is collected. Secondly, the business models to which Volotea will be compared will be argued. As hinted already, these will be the short-haul and regional strategies – all others will be excluded as the comparison has the purpose to see if Volotea could be potentially following any of these business models. Lastly, the archetype airlines, set as an example of the chosen business models, will be presented. This choice will be justified, as they will be selected taking account certain constraints, among which is data availability.

Chapter number 4 will consist of the results of the analysis of indicators. The methodology will be implemented, obtaining a structured comparison of parameters of Volotea with four other different airlines. It will contain, whenever possible, numbers which sustain the theory found on the airlines visited. To avoid repetition, an initial analysis of Volotea itself will be conducted and then referred to at every section whenever needed.

Lastly, Chapter 5 will contain an overview of the results obtained in Chapter 4. Conclusions will be drawn from the analysis and the question of whether it can be considered that Volotea follows a business model of its own will be answered.

1.2 Objectives

All in all, the question of this research study is: *Can the business model that Volotea follows be considered as a* new *business model?*

If this question proves positive, what differentiates Volotea from already existing business models? And what characterises this business model?

Provided that these questions have not been formulated in any previously consulted studies, the present paper will try to explore the answers, to the extent that it is possible. The lack of studies may be due to the assumption that low-traffic routes with an homogeneous route may not have, *a priori*, the potential of being highly profitable, as they can never achieve the economies of scale obtained by the bigger players in the market. However, these are overseeing the potential of developing economies of scope in this market niche. These ideas will be also explored hereunder.

Chapter 2

Literature Review

This section will examine the literature available in order to reveal the theoretical framework on which this paper stands. It will recap, with a scientific background and in a structured manner, the concepts reviewed prior to the forming of this thesis and on which such thesis stands.

As previewed in the introduction, this literature review will start defining the concepts of strategy and business model. Then, the existing airline business models will be portrayed, describing a set of characteristic parameters in a specific sequence, in order give more structure to the content. Such parameters are the differentiation key of the business model, its target customer, any class distinctions, its revenue generation, type of network, type of fleet, type of route operation and possible alliances between airlines. To establish a further connection between theory and practice, examples of airlines – European and non-European – and any other interesting facts that may be useful to understand the literature will be also reviewed.

2.1 Business Model And Strategy

The concepts of business model and business strategy are key in the operation of a company and are not to be confused. On the one hand, a business model is a method which is systematically implemented to generate revenue and maintain a profitable company. On the other hand, a business strategy is a description of the means to achieve the core objective of such a company [13] [14].

In this paper, the business model is the concept of interest. This concept has been receiving growing attention since the mid-nineties, especially among managers and consultants, and has been seen as necessary for a company to become successful[15].

New business models explain the success of a great number of internationally well-known companies. These successes go beyond companies' limits: producing a generation of new mar-

kets [16], leading to the creation of new industries [17], or both. Business model innovation is believed to be able to do this because, in fact, this has already happened in some markets and industries. "Business model innovations have reshaped entire industries and redistributed billions of dollars of value" [18].

Expectations are even greater: "[...] a company has at least as much value to gain from developing an innovative new business model as from developing an innovative new technology" [19]. The business model then becomes an essential part of the strategy followed by the company in order to reach sustainable competitive advantage [20] and the ability to generate new business models, to choose the best ones and implement them in a new or old organization, become a real dynamic capability [21].

Some limitations have arisen due to the concept's recent development, with the lack of a commonly accepted definition being one of them, meaning there is still no common position about the concept in academic circles. In fact, some academics seem reluctant to acknowledge the term [22].

Magretta [23] described business models as 'stories that explain how enterprises work', and added,

a good business model answers Peter Drucker's age-old questions: Who is the customer? And What does the customer value? It also answers the fundamental questions every manager must ask: How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customer at an appropriate cost?[23]

Similar definitions proliferate among other authors [19][21][24][25].

A second category of definitions describes the concept by listing its components. Osterwalder and Pigneur's ontology split the business model into nine elements or blocks: value proposition, customer segments, channels, customer relationships, key resources, key activities, key partners, revenue streams and cost structure [26]. Its graphic representation is known as the Business Model Canvas (Figure 2.1). Akin to this, several other definitions have included a similar set of components [18][27].

Nevertheless, academics find the true potential of this concept in the discovery and implementation of new business models, namely in business model innovation. But, what is business model innovation? [18][19] When is a business model new?

By business model innovation, some authors mean any change in a business model component [28][29]. This paper considers this is an overly broad conception of business model innovation, which would include all kinds of innovation, from technological advances to any change in marketing [30].

Lindgardt et al.[27] suggested a narrower definition of business model innovation: 'Innov-

Figure 2.1: Business Model Canvas [1]

ation becomes business model innovation when two or more elements of a business model are reinvented to deliver value in a new way.' This definition implies more disruptive innovation, in the meaning highlighted by Christensen [31], and can lead to greater changes in an overall business model [30].

The interest of this paper in changes that can create new markets and reshape industries, makes the narrow definition of Lindgardt et al. a particularly useful one. Along these lines, other academics [32] viewed business model innovation as "a process that deliberately changes the core elements of a firm and its business logic" [30].

Having pointed out the importance of the adoption of new business models as a means of searching for new ways to operate an airline in the market and deliver value to customers [33], it is noteworthy that some authors [34] propose that the business model is not a strategy as proposed by Shafer et al. [35], but a tool for analysis and reporting of organizational strategies, contributing to the understanding, analysis and communication of possibilities related to defined projects [34].

Here lies, therefore, the importance to identify new business models and examine their contribution on innovation and value creation of the airline business.

2.2 Existing Airline Business Models

2.2.1 Full-Service Carrier

The Full-Service Carrier (FSC) business model, known to follow the generic differentiation strategy, is the heir of Flag Carriers. The bilateral agreements of aerial services established in the twentieth century fixed the number of airports from which flights could operate between two countries. These Air Service Agreements (ASA) also limited the number of air transport companies that could operate these flights internationally, usually to the Flag Carriers of both countries. Once these companies endured privatisation, most of them transformed into what are known as FSCs today [2]. These therefore maintain many of the commodities that these national carriers offered.

FSCs offer different class fares, each of which provides a service designed for every budget type. However, compared to other business models – which will be later described –, which are dependent on the range or length of flight. These services should meet the customers' expectations and translate to what the customer believes is a fair price in order to be able to compete with the lower prices provided by competitors. This is what the differentiation strategy consists of: offering a unique product – which, inevitably, comes with a price premium.

Before, "unique offering" could simply mean generalised luxury. Today, not everything works. As consumer trends change, the unique offering has to adapt to each traveler profile's needs and ease its commute from A to B, bringing more value to his or her in-flight experience. This unique offering may come in the form of a service – even for a short flight, food may be provided, as well as drinks or a magazine –, the design of the plane itself (low seat-density), the flexibility of their fare offers and, in broader terms, the way the customers perceive the brand's image. This perception of uniqueness is what brings value to the customer – "quality" and "performance" alone are not sufficient. In fact, the latter are imperative in the airline industry, together with safety and security, which does not leave much space for cutting costs and ticket prices [36].

All in all, airlines which choose to implement this business model have to ask themselves constantly how defensible or stable the differentiation is, as well as how effective are the entry barriers.

The target customers in this business model – this is, the customers towards who their strategy is directed – are those who can afford to pay more and who admit the extra price is justified for the additional features they receive.

In most cases, it is the frequent or business travelers the ones who priorize commodity over ticket price. This customer type actually has especially-designed fares which offer high flexibility in booking and changing flights as well as more seat comfort. This is the Business or

Executive Class [36] and it is a core part of the FSC's strategy and business model.

Another class for which FSCs are known for is the so-called first class. This class does resemble a luxurious experience – among other services, it includes the most comfortable seats and all-you-can-eat meals and drinks – and is usually the most expensive fare. This class is normally just available in long-haul flights.

Economy class, on the other hand, is the cheapest class FSCs offer -– although it is normally more expensive than the one-class-fits-all fare of a LCC. Basic services are still offered, though, unlike in a LCC – these range from a small snack and drink to a magazine. Seat spaces are the narrowest here and there is less legroom compared to higher classes. This option is often purchased by leisure travelers. Many FSCs also offer an upgrade to premium economy, which may contain slightly more comfortable seating – with more legroom and wider space.

Classes are usually physically partitioned and there is a clear differentiation between one another in bigger aircraft, particularly for international flights.

In any case, it has to be ensured that the additional benefit is directly proportional to the customer satisfaction — whichever type of customer it is referred to –, for the revenue model to work.

Something that started off as characteristic of FSCs is the frequent-flyer program. These work with points to reward loyalty and therefore keep the customer engaged. Points may offer benefits such as cheaper flights or discounts on products offered by the airline itself or by partner companies. This means that they enable the airline to maintain its presence in the customer's life, not just in-flight, but also during the time in between flights.

When it comes to revenue generation, counterintuitively, a price premium may lead to a cost disadvantage. This is mainly due to a lower volume in sales. Therefore, this model of revenue generation pursues to cover costs with the sale of economy class tickets and produce earnings with business- and first-class tickets[36].

Another distinctive feature about FSCs is their network: the Hub and Spoke system. Returning to the historical-background narrative of FSCs, in order to give international service to the rest of airports of the country, and conditioned by the regulatory limitations, Flag Carriers established domestic routes that linked this international exit point with the rest of national destinations. This international airport acted then as concentrator (Hub) and connected the rest of national destinations with radial routes (Spokes), configuring a network now known as Hub and Spoke (H&S) [2].

Today, the FSC's hub would be a specific airport, typically the main airport of its national country's capital city. The operation from this point is simple: all flights have either origin or destination in this hub. The FSC is often partnered with a Regional Feeder, which operates the lower-traffic routes from and to the hub. In this way, all smaller groups of passengers from

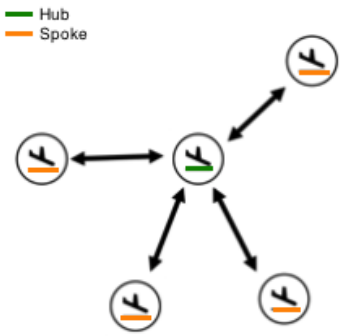


Figure 2.2: Hub and Spoke Network [2]

smaller cities concentrate in the bigger city, summing up to a critical mass enough to fill up a bigger aircraft. This is how economies of scale are achieved. Many airlines, though, have more than just one hub – both still typically in large cities of the country of the FSCs. This dynamic can be seen in Figure 2.2 [37].

Advantages of a H&S network are that they allow for an efficient use of scarce transportation resources and increase the market coverage: with a reduced number of routes, it connects places with less original volume through the aviation network and simplify planning and provision of aircraft, personnel and spare parts. It also reduces costs by using larger aircraft and can simplify the planning of regular maintenance.[36]

On the other hand, this type of network is unattractive to passengers, as it consists of multiple stopovers. It also creates congestion and delays at hub airports, therefore requiring high performance of the infrastructure at peak times. The system has also high complexity and is susceptible to interference. [36]

Given the wide range of connections that may be performed by a Hub-and-Spoke network, there is a need for availability of an adaptable and flexible fleet. This therefore demands for an heterogeneous fleet that allows to plan for all sorts of flights, including long- and short-range and high- and low-capacity aircraft, although FSCs have an increasing focus on long-range operations. [36]

A final characteristic of a FSC is that most of them belong to an alliance constituted by other FSCs around the world. Strong alliances allow them to cooperate in many ways: fly in shared code and partner up for unplanned maintenance or operational events. Examples are the Star Alliance, Oneworld or SkyTeam. [36]

The biggest FSC in Europe is Lufthansa – with its main hub in Frankfurt and its second one in Munich and it belongs to the Star Alliance which consists of 26 airlines worldwide. Other FSCs are KLM, Air France and Iberia. Another example outside Europe would be Delta Airlines, with its hub in Atlanta in the US, belonging to the SkyTeam Alliance with 20 partners worldwide.

2.2.2 Charter Carrier

A Charter Carrier operates on the basis of rented or leased flights. They are mostly known for being part of a holiday package. This is, a tour operator will lease a flight and combine the costs together with other elements of a holiday, such as hotels and transfers, and sell the whole thing as a package to the customer. Sometimes they can work with FSCs too [37][36].

This can be convenient, as these trips are usually acquired by a big group of people – which makes up for the renting of the aircraft – and avoids stopovers to reach the final destination.

The majority of the customers of a Charter airline are, then, found in the touristic market. Nevertheless, there are other possible uses of Charter Carriers alongside tour operators: they are also rented for private use – for instance, a football club may rent an aircraft of this type to take the whole team to a match destination. All in all, they are operated on an ad-hoc basis, this is, when required. For this reason, they fit into the category of non-regular flights.

These flights do not normally offer as many commodities as one would expect in a scheduled flight. They have just one class and they normally take off from tertiary airports at off-peak hours [37].

There are a few key factors that enable this strategy to work: the reduced operative costs, as they use big aircraft that operate at an almost full capacity – multi-use personnel to simplify operations and reduced costs of commercialization, as flights are mainly offered by touristic agencies. Costs are then covered by the sale of tickets and earnings come from ancillary revenues [37][36].

Their fleet is homogeneous and sometimes additional aircraft are leased. It could be considered, then, that these carriers operate a Point to Point network, although it rather depends on the customer's needs and it can be either short-, mid- or long-range [36].

Known Charter airlines in Europe are TUi or Condor. An example outside Europe would be Pegasus Airlines, in Turkey.

These carriers were very popular in the 1990s, but seem to be in decadence since the air travel catapulted with the raising of the LCCs. However, there seems to be a reformulation of the concept with relatively new airlines such as Evelop, Plus Ultra or Wamos Air. The idea is not quite the same: these are not exactly Charter as in unscheduled and non-regular. Instead, they fly to specific holiday destinations. For instance, from Madrid to South America, Portugal or the Balearic Islands in a seasonal manner and do direct flights which to holiday destinations.

2.2.3 Low-Cost Carrier

The Low-Cost Carrier (LCC), known to follow the general cost-leadership strategy, set with its raise a before-and-after in air travel. It enabled people with lower income to access what was earlier understood as a luxury service and has ever since increased the utilisation of means of air transportation throughout the entire world. Consequently, it promoted tourism to the extreme.

This, though, came with a limited offer of in-flight services, which transformed an airplane trip to what it actually is: just a means of transport that carries passengers from A to B – as a car or a bus does. For many, the flight has stopped being part of the whole travelling experience and is just what one has to deal with in order to arrive the actual experience – especially where distances are insignificant, as it is in Europe.

To better understand the evolution of a LCC, it is important to track it back to the world's biggest LCC: Southwest. It was in fact not the first airline to implement this business model – it copied the strategy of Pacific Southwest Airlines, but took it to the limit. The airline was so successful in disrupting US airfares that the economic term "Southwest Effect" was created in the late 1990s as their entry into any route would completely affect its dynamics. Such effect occurred in three stages: it first increased supply and offered lower prices on that route. This led airlines that already operated such routes to lower their fares to be able to compete; then sales for all airlines rose. As a consequence, lower prices would increase the overall demand for air travel and, at the end of the day, carriers who had lowered their fares view a compensation as they had improved their load factor [38].

This model was copied in Europe almost 20 years later by Ryanair and others. Ryanair also completely reshaped the European markets and there is currently a Ryanair flight departing every 45 seconds. LCCs now dictate prices in most markets and is one of the engines of their constant growth [39].

The target customer in this business model is, for the most part, a frequent traveler on a budget or a holiday traveler.

One of the basic principles of an LCC would be that it has only one class that fits all. This class consists of narrow seats with short legroom. Any extra upgrade or "frill" is limited and has to be payed for [37].

In LCCs, fixed costs are covered by the tickets themselves and any supplementary earnings are generated by ancillary revenues. Ancillary revenues mean not just the food or drinks – LCCs are always creating side-businesses that complement their main business. Examples of these are rental car companies, but now they also have an offering of accommodation and experiences as well as sale of additional products and off-flight services.

The coverage of fixed costs is possible due to the fierce reduction of all costs, which enables plane ticket prices to be lower and results in the selling out of entire flights. This is, although the tickets are a reduced price, the fact that all seats are sold out, makes it possible to cover expenses.

This dynamic also benefits the airline as it secures a huge volume of sales and the full capacity of the airline is fully covered. It triggers rapid buying in customers, who fear prices will go up or that the plane trip will be sold out when they decide to purchase the ticket.

In comparison to an FSC, the seat density in a given aircraft model is higher in a LCC. This is because the cabin is utilized to achieve a maximum number of seats – this is also mainly the reason why there is less legspace: it enables the fitting of one or two more rows of seats, maybe also with a reorganization of toilets or cutting back the number of toilets to the strictly legal. No differentiation of class also enables a higher utilisation of space as there is no need for physical divisions [37].

Another fact that enables cost reduction of the LCCs is that tickets are sold by direct integration [37]. Ryanair was a pioneer in Europe with what now seems normal – buying the tickets off the internet. As well as online sales, though, they have a call center available to make ticket reservations. By completely eliminating intermediaries – agents and GDS – they significantly reduced costs and agilised the process. This means of sales is now widely used by FSCs too [37].

One more strategy related to ticket sales is the overbooking of flights. Most airlines do this, as, statistically, a certain number of people who buy the ticket do not make it to the flight. That is why it turns out to be more profitable to carry a full aircraft and pay compensations if needed, rather than having a few empty seats per flight.

Another means by which costs are minimized in LCCs is making use of secondary airports. These are cheaper to operate in as they are less frequented, have more slots available and are away from the monopoly that the Flag Carrier may influence [37].

Other areas in which the operating costs of the LCC may be reduced are the handling at the airport and the services for the passengers – for instance, the passenger boarding bridge or performing boarding right next to the terminal. These provide a more comfortable service to passengers but represent higher costs for the airline – and consequently for the flight tickets [37].

The high utilization of the aircraft and lower time on ground also significantly reduce costs. LCCs work hard on achieving quick boarding and deboarding of passengers and efficient handling in order to be the minimum waiting time on land. That is why typically these fleets have to be checked on a more regular basis, as they have more flight hours in less time thanks to reduced turn-around times [37].

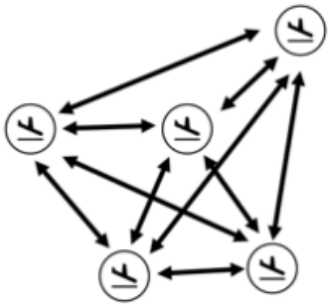


Figure 2.3: Point to Point Network [2]

Low operational costs are sought with employer policies too, with minimum staffing outside the cabin and with temporary contracts. This translates into less fixed costs in staff and also in office spaces.[37]

When it comes to network operation, LCCs use the Point-to-Point transit, seen in Figure 2.3, which has completely different approach to that used by FSCs. No hubs, no transfer flights – this network eliminates the need for connection flights and therefore reduces travel time. These are usually more convenient for the passenger. There is also less risk of baggage loss and less chance of accumulation of delayed flights (domino effect). Total fuel and pollution per passenger are lower too.

This network operation makes sense with cheap flights, as they always load up. Because of this, frequencies may be lower than in a typical Hub-and-Spoke network. In the case that a customer would want a connecting flight to some other destination, he or she would have to book it separately, as LCCs do not sell these flights as a pack. This also simplifies fare structures.

LCCs operate short- to mid-range routes. Attempts to implement the LCC business model in longer routes are being taken, as set out below, but this limits cost reduction in many ways.

LCC fleets are homogeneous: frequently composed by one single type of aircraft or, at most, aircraft from the same family. This allows for lower expenses, as economies of scale are achieved. Costs on maintenance go down, as well as costs in mechanics' and pilots' training and inventory of stocked parts for maintenance. It also allows for a better deals when negotiating prices with manufacturers for aircraft purchase orders [37].

Unlike FSCs, LCCs are not usually part of any alliances.

All in all, LCCs are characterised by being especially careful about their spending and make the most out of every cent. This policy results effective when applied in all areas and maintain a consistent alignment with the marketing and offering of their products and services.

It can be argued that this strategy is based on innovation: especially during the last years, LCCs have been transforming the status quo and reworked it so that it was acceptable to pay extra for what had been for years a basic, changing the rules of the game.

Contrary to the process of product dynamics in which a potential product, initially considered a luxury, transforms into a basic benefit, Ryanair did the opposite. What was considered basic benefit was turned to a luxury. [40]

In the first years of Ryanair, for instance, passengers would have to pay if they did not do the check-in in advance and bring the ticket printed out by themselves. Examples of this are also present with seating system: the normal service provided by an airline at the time gave the possibility to choose a seat at the time of the purchase; Ryanair started providing a random seat to the customer and later on even made the passenger pay in order to be able to choose it. Nowadays, there is even different quotations, depending on where the seat is located – more leg space meaning extra money. These seats are not even assigned directly to a passenger who does a late check-in, forcing the passenger to do an on-site check-in – hence arriving earlier to the airport – or pay for the extra frill. Another recent change in Ryanair which was considered a "basic" is their change in having to pay for a carry-on. Before the spreading of LCCs, even a checked bag was included with the ticket.

All this assures that people will pay for it, as it is a need and not an "extra". The perception of the initial price as very low (as the first impression for the passenger), together with the already-present perception of the airline as Low-Cost continues to promote the purchase.

Typical examples of LCCs have been named already: Ryanair, which operates exclusively in Europe and Southwest, which operates exclusively in the US.

The LCC concept has been so successful that different ways of exploiting it, beyond the original model, have been sought, such as the following.

Long-Haul Low-Cost Carrier

A controversial variation of the LCC would be the Long-Haul Low Cost. Its economic viability has been questioned many times as every company which has ventured into implementing this business model, ends up surviving thanks to its short-haul alternative brand. And all together, few airlines have made true Long-Haul Low-Cost work in a sustainable way, despite some of them achieving sporadic profitability.

Provided that in long-haul, fuel represents a large portion of the cost of flight, there is little to no place to cut down on costs. The fixed costs are therefore a big percentage of an FSC's international flight ticket. Only some airport handling or catering costs may vary with the amount of passengers [41][42][43].

Also, in flights of these characteristics, it is more difficult to incite people to purchase impulsively just for the sake of a short vacation, as longer flights are normally worthwhile when spending a longer time at the destination.

This carrier type is not intended for the business traveller and is rather directed at the budget leisure traveller. Business class is a key part of the revenues generated by a typical FSC's long-haul flight, so not reaching these customers wastes a big part of their potential market.

Some airlines that have attempted this model are Norwegian in Europe and Jetstar in Australia. [36]

To sum up, this sector remains in its infancy. With further development, these airlines may become sustainable, but, for the moment, these are just a "lower cost" rather than truly low cost option.

The Hybrid Carrier

Over the recent years, many airlines have started to follow hybridized business models. Most, though, started implementing the LCC business model, but gradually evolved into adapting characteristics from FSCs too. It is now therefore common to find that the frontiers between LCCs and FSCs are starting to blur. "Hybrid" is a characteristic that can adopt variable values – an airline can be more or less hybridized, and what is more, in different ways and according to different parameters [44].

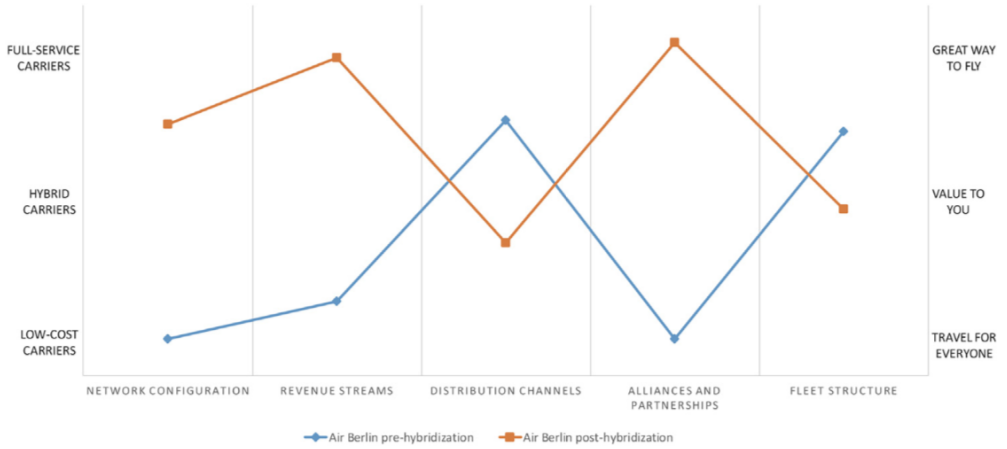
Most hybridisations are looking to offer a unique value-adding service to passengers - as the key to differentiation - and to secure a competitive advantage. As it is happening today in all other industries, the airline industry is leaving behind "old-fashioned" models, which presented their services as a "favour" to the customer, and shifting the focus to what customers – of all kinds – demand.

As many hybrid models did not start off as hybrids, questions arise regarding whether these strategies can be implemented from the beginning or if they are sustainable during prolonged periods of time, as airlines especially focus on the outcome of its strategy on the long-term. The success of those that work today may simply be, then, isolated events.

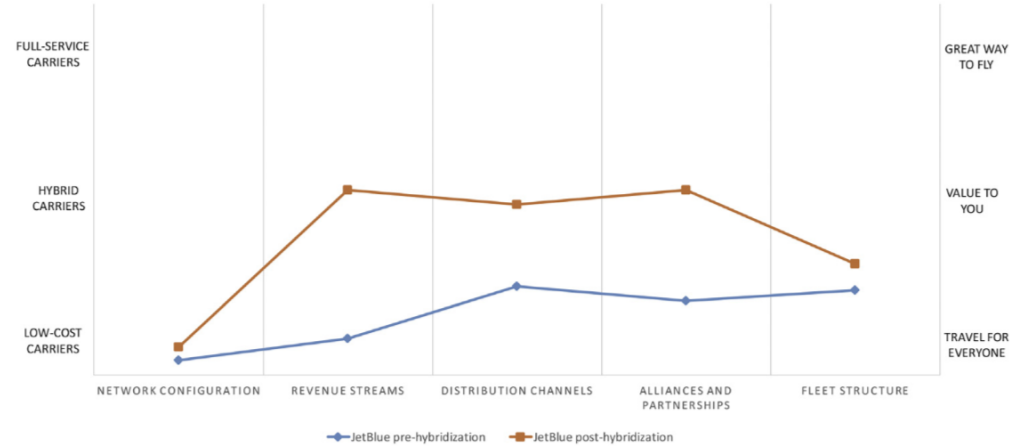
There is a large number of carriers considered as LCCs that have in fact evolved into hybrids [33] from initially following this business model. What a hybrid is like, though, cannot be defined, as it is a middle-point position in the spectrum between FSC and LCC – this is many initial LCCs have moved towards the FSC end of the spectrum [3].

Examples of these would be JetBlue or Air Berlin [3]. To achieve a better understanding of what a hybrid's business model looks like, it is best to show the results of Corbo's study on

the mentioned companies in Figure 2.4.



(a) Air Berlin's business model alignment curve



(b) JetBlue's business model alignment curve

Figure 2.4: Results in L. Corbo's study [3]

A hybrid airline, therefore, combines features from a FSC and a LCC into a unique business model. It takes advantage of its individual operational capabilities to differentiate itself in terms of pricing, product, fleet, network design and overall efficiency. Within the two mainstream business models, there is a myriad of airlines utilising the best of each model [3].

The hybridization in this case is therefore presented *per se* as a business model strategy that aims to achieve differentiation.

2.2.4 Regional Carrier

A regional airline is defined as an airline that operates regional aircraft and provides "passenger air service to communities without sufficient demand to attract mainline service" [45].

According to this definition, what is particular about this business model is that it covers the demand of communities that are not big enough to draw the attention of a LCC or FSC with frequent and regular service.

The target customer of such carrier is, then, a person who would otherwise have to make use of a different means of transport to get to a main airport, either for work or for pleasure, and most probably would have to spend time on stopovers, with no other option [36].

Regional Carriers typically fly low-traffic and short-range routes. Fleets are usually composed by homogeneous, single-class aircraft, which may be either regional jet aircraft or turboprops. The key, in any case, is that they have to balance out frequencies in order to fill up the aircraft and still attend demand hours. Their earnings come from ancillary revenues, having covered costs with the ticket sale of the economy class [36].

The network type would be Point to Point, however, this is subject to particularities as will be seen in the following subsections. The same applies to their alliances.

Regional Carriers can take two forms, according to the Literature: Feeder airlines, affiliated to a major airline; and independent airlines, which provide service to small, isolated regions [45].

Feeder Carrier

Feeder Carriers are basically in charge of "feeding" an FSC with passengers, as hinted when defining FSCs. They are considered to follow a regional business model due to the fact that they fly short-range routes on aircraft with a lower capacity. They pick up passengers from smaller cities and "collect" them in the hub so that the FSC then flies them all in a bigger aircraft to another location. For this reason, the leg covered by Feeders is within a H&S network.

FSC and Feeder operate together as, in a way, they "need" each other to survive. On the one hand, partnering with a bigger airline secures the regional airlines enough passengers and survival. On the other hand, the routes that the Feeder flies would imply more difficulties if it was to be covered by the FSC, as it would demand different fleet specifications and a general different business approach. It is very useful, therefore, that the Feeder operates these flights for them as a separate business unit. The customers that come in and from the hub making use of the Feeder are an indispensable part of their customers and represent a high percentage of the passengers needed to fill up a bigger aircraft - key of the functioning of a Hub-and-Spoke network.

Often, these flights will be advertised by the FSC itself as part of a connecting flight. The way to recognise the Feeder airline will be stated in the ticket as "Operated by *[name of the Feeder]* ".

Examples in Europe are Lufthansa City Line, as the Feeder airline to Lufthansa Passage, or Air Nostrum as the Feeder airline to Iberia. Outside of Europe there is, for instance, Japan Air Commuter, affiliated to Japan Air and the Japanese State [36].

Some of the Literature also talks about the "Dual-Brand Strategy", as it is actually two completely separate businesses, with different business models, that need and complement each other and work well together [36].

Geographically-Bounded Regional Carrier

This type of regional is described as "operating as an independent airline under their own brand, mostly providing service to small and isolated towns, for whom the airline is the only reasonable link to a larger town" [45].

The distinctive feature of this airline type is, then, that it connects "isolated towns". A clear example would be the aerial connection of islands within an archipelago. Such Regional Carrier would have the objective of connecting islands with one another first, then of connecting these with the mainland.

Again, as this demand is small and so localized, it needs a fleet of low-capacity, short-range aircraft, which operate the Point-to-Point routes at studied frequencies. Such routes would be too specific for a traditional airline to operate and take benefit from, as the characteristics of the route would be not fitting to their fleet. Demand would not be enough to attract their attention either, them being able to make more substantial and secure profit in routes that are more fitting to their business model.

The implementation of this business model is found in airlines all over the world. The islands of Hawaii, for instance, have an airline that connects the airlines with each other and with the mainland called Mokuele. An example in Europe may be the airline Binter that operates flights in the Canary Islands.

Binter also operates mainly inter-insular flights and has expanded its reach to Cabo Verde, the Macaronesia and West Africa, as well as flying to the Spanish mainland and the Balearic Islands. In fact, as happens with Feeder airlines, Binter has settled with Iberia the deal for which it may partly operate inter-insular flights that are part of a connecting flight to the Peninsula for a major commodity of passengers [46].

Binter has absorbed other airlines that used to operate this same business model in the area and actually has a "Feeder" itself, and sells tickets with the label "operated by Canarias Airlines". This could be classified as a regional within a regional. It could also be considered as micro-FSC within its small environment, a FSC at a local level [46].

The existence of competition, then, denotes that this business is not just intended for

tourism, but rather for commuters or visiting friends and relatives. As it is a very specific situation which limited resources to get from one place to another, there is a clear need for this sort of transport and there is a clear niche that requires it and is willing to pay for it.

On a side note, after exploring the websites of these airlines, it becomes apparent that these are not one hundred per cent "attractive". Although this may not be necessary for the correct operation of an airplane, it is quite important nowadays to have a good website that may attract the customer. This may show, once again, that it attends a need, rather than try to create it [46].

Given the nature of these Regional airlines, it is especially important when applying their business models to consider the possible competition with other means of transport – the ones that are already there and have been traditionally used to connect these destinations. In the case of the Feeder it would be the train or car, and in the case of a Geographically-Bounded Regional Carrier within an archipelago, a boat.

Chapter 3

Methodology

This chapter describes the method that will be followed to gather the necessary information to answer the question of whether Volotea follows an alternative business model. The approach taken is to compare Volotea with an archetypal airline of each of the currently existing models. Then, the resulting data will be compared to that of Volotea. As the airlines chosen will typify the business models described in the theory, the comparison of parameters will be potentially able to identify substantial differences, if any, in the operations carried out by Volotea.

The following sections will define the parameters chosen for the comparison and justify why these are good indicators; as well as which business models are suitable for the comparison, as not all of the explained in the Literature are relevant to the study. Lastly, provided that the study is based around the practical implementation of a business model by an airline – namely, Volotea –, this airline will have to be compared to other airlines, not just the theoretical basis of the business models presented in the Literature Research. Therefore, it will also be justified here, which airlines are chosen to do the comparison, each of which will follow one of the business models chosen. Finally, the structure in which the final comparison of parameters will take place will also be specified.

3.1 Justification of the Parameters of Choice

The following parameters will allow to establish a comparison between the characteristics of each business model. Each airline will be analysed according to these parameters and the results will be then compared to those of Volotea.

1 **Attended Destinations**

- **Target Market:** this parameter will include comments on the type of customer that the airline targets, as well as their distribution strategies and their reach. Besides

this, it will be identified whether their service is offered to any particular closed niche, in terms of market segmentation or geography.

- **Airline's Destinations:** this parameter will give an overview of the amount of destinations and countries that the company operates as of February 2020. It will also show on a map such destinations and extract superficial conclusions of any characteristics that may stand out strictly from taking a look at the map.

- **Airports Operated:** this parameter will show, whenever possible, which percentage of the passengers carried by the airline are flown to a certain airport size (total passengers – outbound and inbound from each airport). This will act as a measure to determine the type of airport that each airline flies most of its passengers to. This would clarify an important point of their business model, as it can determine a difference in the niche of customers that each airline directs its service to.

  Given that passenger figures per operation are only available at the AENA Statistics portal [5], and these only record movements from and to Spanish airports, this study is only conducted only on a number of Spanish airports. The data used will be that for 2019.

  The size of the airports will be characterised by amount of passengers that pass through it per year. Therefore, the intervals in the x axis will represent the airport size in terms of passenger quantities. The rule of thumb will be: the bigger the amount of passengers, the bigger the airport.

  The size ranges have been chosen after collecting all the data and detecting distinctive groups. Such ranges will be the following: airports with less than one million passengers, between one and two million, between two and ten million, between ten and thirty million and more than thirty million passengers. In order to ease the description of the graphs, airports with less than 1M passengers per year will be referred to as small, those between 2M and 10M will be referred to as medium-sized and those with more than 30M passengers per year will be referred to as big-sized airports. 34 airports will be studied in total as those with less than one hundred thousand passengers per year will be dismissed.

2 Attended Area

- **Limits of the network:** this parameter aims to define the geographical area that the airline operates. It will also pinpoint the cities that define the furthermost ends of its network as of February 2020.

3 Network Topology

- **Airport bases:** this parameter will shine a light on the number and location of

airport hubs and primary bases of the given airline as of February 2020. This has strategic importance and can directly define the type of network that it follows.

– **Degree Centrality:** this parameter aims to define the extent to which a network is centralised around a certain airport. To do so, following [2], this paper will use Freeman's work applied to the study of the centrality of the network of an airline, instead of a social network [47]. This parameter will act as indicator of the extent to which a node or vertex of a network is connected to other nodes, using Equation (3.1).

$$c(k) = \sum_{i=1}^{n} f(i,k) \tag{3.1}$$

Where

c(k) is the degree of connectivity of node k

f(i,k) is a function that is equal to 1 if only if the nodes i and k are connected by an edge and 0 in any other case

n is the number of total nodes of the network

To measure out the extent of a network's centralisation, Freeman proposes another expression, seen in Equation (3.2). This measure, DC, will be the parameter used as a comparative measure of the airline's network.

$$DC = \frac{\sum_{i=1}^{n}[Max.c(k) - c(i)]}{(n-1)(n-2)} \tag{3.2}$$

Where

DC is the degree centrality of the network

Max.c(k) is the degree of connectivity of the node which is best communicated out of the n nodes of the network

c(i) is the degree of connectivity of node i

(n-1)(n-2) equals the maximum value that the numerator can reach and, once divided, normalises the result, making it vary between 0 and 1

The data gathered for this study dates of February 2020 [11].

– **Network Configuration:** this parameter will describe the route system structure of the airline. In principle, there are two main types of networks present in the literature: Hub-and-Spoke network and Point-to-Point. Based on the existence of a Hub and the Degree of Centrality of the routes, each airline will be defined as one

or the other – or the one it is the closest to.

4 Attended Routes

- **Longest and shortest routes:** this parameter will show and briefly comment the longest and shortest routes that the airline operates as of February 2020.

- **Distances flown:** this parameter will reflect the output of an analysis of the distances covered by each of the routes that the airline has in operation as of February 2020 [6]. The distance ranges will be divided into the following ranges: lower than 500km, between 500km and 1000km, between 1000km and 1500km, between 1500km and 2000km, and anything larger than 2000km.

  Given these results, the airline will be defined as covering short- (around 500km) , medium- (around the 1000km to 1500km range) or long-range (around 2000km) flights.

5 Frequencies

- **Average number of weekly and daily flights per route:** this parameter will show a study of the weekly and daily frequencies of the routes operated by the airline as of February 2020.

- **Seasonality of routes:** this parameter aims to determine up to which point the airline operates seasonal flights. It will count on the study of the seasonality of the routes of the airline in the year 2019.

6 Fleet Characteristics

- **Models:** this parameter will show a list of the aircraft utilised by the airline, together with its specifications on age, range and capacity as of February 2020. Comments will be drawn to the type of aircraft and homogeneity (according to the aircraft's manufacturers and aircraft familes). The fleet acts many times not only as an indicator of the current operations of the airline, but also of its future intentions and it has great strategic importance and relevant on the business model.

- **Ranges:** given the information on the aircraft's range in the Models section, this parameter will expand on the different ranges and the average range of the airline's fleet.

- **Capacities:** given the numbers of the capacities in the Models section, this parameter will expand on the average capacity of the airline's fleet and comment on the limitations of the cabin size.

3.2 Justification of the Business Models Studied

After a initial examination of Volotea, it appears that it flies regular, short- to medium-haul flights. For this reason, Charter Carriers and Long-Haul operators, such as FSCs and Long-Haul LCC will be excluded from the comparison. This leaves four remaining carrier types from the ones examined in the Literature Review: ordinary LCCs, LCC hybrids and the two defined types of regionals - Feeders and Bounded Regionals.

Volotea has been previously defined as being an LCC [48]. This is why it is important to verify or dismiss this characterisation by comparing it to the differentiating features of a LCC. This would include comparing it to what it is right now considered as a LCC hybrid.

However, the possible differentiating value of Volotea may be in the scene of low-traffic routes and their evolution. For this reason, it is important to take into account its possible share in the Regional Carrier world, as "regional" has been mostly linked to low passenger demand. In this aspect, the LCC business model has gradually been shifting on to capturing the same market niche as an FSC: the crowds. This has led LCCs to their full optimisation of resources; in this process, though, the low-traffic market has been left unattended. In this scene, Volotea may have emerged to cover the empty spot on the market that the rest of business models have left behind while developing towards busier markets. For this reason, both the Bounded Regional and the Feeder airline will be examined.

Within the Bounded Regional scene, there are some carriers that center their operations primarily in an archipelago, as mentioned in the Literature. These will be discarded and a Bounded Regional in the mainland will be chosen instead, as its area of operation would be more similar to Volotea's – which operates within a continental mainland area – and the overall purpose is to ultimately determine whether or not Volotea can be classified into this category.

3.3 Justification of the Airlines of Choice

Hereunder, it will be justified which airline is chosen to characterise each of the business models, previously stated, that are going to be compared to the case of Volotea; as well as the criteria followed to choose each airline.

A criterion that this study has tried to pursue is the selection of Spanish airlines. This is due to the availability of air traffic statistics data in the AENA website - the Spanish public company that manages airports of general interest in Spain and other countries. This constraint in data availability means that some parameters may not be able to be studied outside the territory of Spain. In the case of absence of data for needed analyses of routes outside of Spain, the data

obtained for the Spanish territory may be able to be extrapolated, but this will be justified individually for each specific given case. As a general rule, this will happen with the study of the parameter of Airports Attended.

The airline chosen as exemplary of a LCC will be Wizz Air. This company has the largest fleet of any Hungarian airline, although it is not a Flag Carrier, and is also the largest base at Budapest Airport. The airline offers affordable flights to central and eastern European countries [7]. Wizz Air flies with two airline codes: its main code W6 and its relatively new code W9 that operates exclusively from London Luton. This paper will be only looking at the flights with the W6 airline code.

As it has some presence in the Spanish markets and the fact that it basically embodies the theory behind what an LCC is, Wizz Air has been selected to be analysed and compared to Volotea.

The example airline of a hybrid LCC will be Vueling. Although this airline has been defined as a pure LCC along its history, after further study, the airline results to have gone through multiple hybridsations over the years. However, it still contains most of its characteristics similar to a LCC.

Vueling Airlines is a Spanish airline based in Barcelona. It is the biggest airline in Spain in number of destinations and in size of its fleet [49]. Given its high presence in Spanish markets, the availability of its data and the apparent similarities with Volotea in some aspects, this airline has been chosen as the candidate to characterise a hybrid LCC for this study.

As the example of a Regional Feeder Carrier, Air Nostrum will be examined. This carrier is also known as Regional Iberia as it mainly supports the FSC Iberia. Air Nostrum was founded in 1994 in Valencia (Spain), aiming to become the reference regional airline in the south of Europe. It operates low- to medium-density routes in niche markets in Spain and is present in almost all its Autonomous Communities. Many of its routes are Public Service Obligation (OSP in its Spanish acronym) or as feeder for Iberia at low-hours for high-density routes [12].

It therefore complies with both imposed criteria: it is a Feeder – the carrier type aimed to analyse – and either or both origin and destinations of its routes are within Spanish territory, so there will be full availability of all data for its study.

The Bounded Regional Carrier chosen is the Norwegian airline Widerøe. Widerøe describes itself as the largest regional airline in Scandinavia. It mainly flies along the coastline on the north and west of the Scandinavian peninsula, which are all indented with deep fjords up to the Lofoten Islands, reaching beyond the Arctic Circle [10]. The airline mainly operates short-haul, although it does operate international flights to nearby countries too.

Widerøe has been chosen as there are no airlines in Spain which strictly adjust to the Bounded Regional business model, aside from Binter, which is centered around the Canary

Islands – an archipelago, discarded due to the geographical difference in operation to what Volotea does. However, some of the statistics of Norway are also available and it has been considered to be a Pure Regional given its characteristics.

Chapter 4

Results

4.1 The Case of Volotea

In order to avoid the repetition of Volotea's analysis when compared to the different carriers, a first analysis of this airline will be conducted.

4.1.1 Attended Destinations

Target market

Volotea's target market goes hand in hand with the fact that they operate low-density markets. Carlos Muñoz, CEO of Volotea, states that the company tries to better connect mid-cities – cities with a significant population and interesting attractions to go visit – that have been avoided by large Low-Costs in the long-term, as they have swifted focus towards big markets.

Muñoz also states they try to "fly where other people don't fly"[48] – where other people don't fly *directly*. This is, Volotea targets those who would rather avoid stopovers or other means of transports.

Again, according to Carlos Muñoz, Volotea actually focuses in "stimulat(ing) people to travel, who would otherwise stay at home"[48]. This is, the company aims to attract the attention of a niche of people who did not have the preconcieved idea of flying.

"Whether they fly for leisure, whether they fly for visiting friends and relatives or whether they travel on business"; "whether they are technologically savvy [...] or not and still go to the travel agent or they prefer to compare-shop in an OTA or are a small company and use some type of corporate agency". This is how Muñoz gives importance to Volotea's distribution strategy and emphasizes that the airline tries to reach every possible customer that wants to

fly within the small-market it operates, and this is why Volotea does not just restrict itself to internet distribution, but also counts on GDS and all possible distribution agencies. "We have to reach absolutely everybody [...] to make sure they will find us", he says [48].

Volotea's Destinations

Figure 4.1 shows a map of the destinations operated by Volotea. The airline serves 20 domestic destinations and 69 international destinations in 14 countries, as of February 2020.

Figure 4.1: Destinations operated by Volotea [4]

Two conclusions can be drawn from a first look at this map:

1. Volotea flies almost exclusively the south of Europe and most cities are right on the coastal areas.
2. Volotea only operates the capital cities of 4 out of the 14 countries it flies to (namely, Madrid, Prague, Vienna and Athens).

At first sight, these cities could be considered vacational destinations. However, as commented in Section 4.1.1 the routes operated are those that have "interesting reasons to go visit".

Furthermore, Volotea's development during the last years has seen a tendency to expand to the north of Europe too.

Therefore, it is important not to fall *a priori* into the idea that Volotea is a vacational carrier.

Airports Operated

Again, when Volotea describes itself, it states that the company attempts to "connect small and medium sized European cities with non-stop direct flights at very competitive prices" [4]. In order to verify this statement, data has been collected in Figure 4.2 that shows the airports to and from which most of its passengers are flown in Spain.

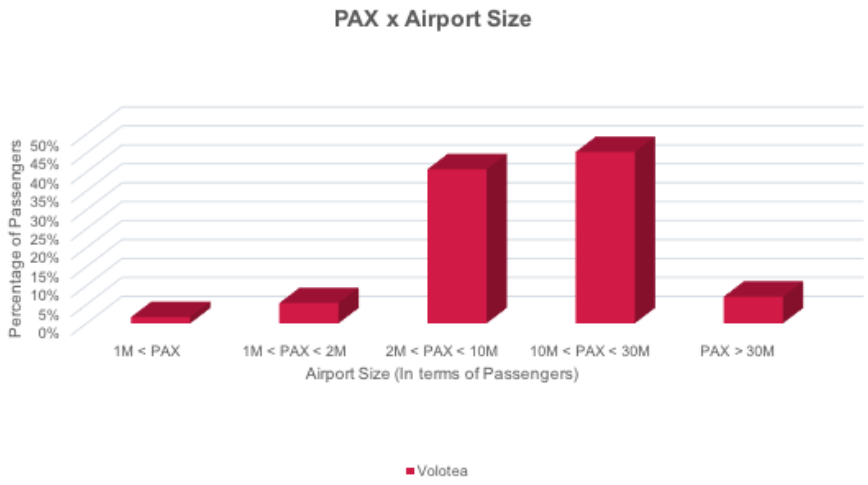


Figure 4.2: Percentage of passengers flown by Volotea to airports of different sizes [5]

Out of the 34 airports studied to obtain Figure 4.2, Volotea flies 23, 16 of which are below 10M passengers.

The graph indeed shows that Volotea operates more than 85% of its flights to mid-sized Spanish airports. These airports, to gain a general understanding, are cities such as Mallorca, Malaga or Valencia.

Given these differences, and verifying in Figure 4.1 that there are not many big airports among Volotea's destinations, it is safe to assume that this tendency would be reproduced in other countries in which the airline also operates.

Given this analysis from Volotea's target market, the destinations it operates and the airports it flies to, the **destinations attended** by the airline are classified as mainly **mid-sized airports**.

4.1.2 Attended Area

Limits of the network

The furthest away points of Volotea's network are Gran Canaria to the South-West, Hanover to the North and Rhodes to the East. From end-to-end, there is more than a 4000km distance.

Except for two destinations in the North of Africa (Tanger and Marrakech), all its destinations are in Europe, mostly in the south of the continent.

A one-word description of the **area covered** by Volotea for comparison purposes, would be **continental**, although it technically just operates a part of the continent.

4.1.3 Network Topology

Airport bases

Voltoea's bases are seen in Table 4.1. It has a total of 14 bases.

VOLOTEA		
Hub	**Bases Spain**	**Bases Abroad**
–	Asturias	Cagliari
	Bilbao	Genoa
		Palermo
		Venice
		Verona
		Bordeaux
		Nantes
		Toulouse
		Strasbourg
		Marseilles
		Athens

Table 4.1: Volotea's bases [11]

A series of conclusions are drawn from Table 4.1:

1. Volotea has no hub – this is, it does not use an airport for connectivity purposes as an FSC does with a H&S.

2. Volotea has more presence in France or Italy than it does in Spain – this is, it does not base its operation in a region or specific territory and has more focus outside the frontiers of the airline's nationality. In fact, Nantes and Venice are its bases with the biggest amount of route connections: 32.

3. Most of these cities are medium or big-sized cities, but not country capitals - this reflects again that the airline flies small- to medium-sized cities and avoids big, crowded airports that are already attended by larger airlines.

Degree Centrality

Volotea's Degree Centrality is 0,32. This value indicates that, in the spectrum of network connectivity between the Point-to-Point network – completely decentralised – and the Hub and Spoke network – completely centralised –, Volotea would be closer to the decentralised end.

Network Configuration

Figure 4.3 shows the full network of Volotea. The list of bases has been highlighted to show that they act precisely as individual origin or destination points from which many routes depart. It also stands out that all destinations are extensively connected and not many are a part of just one route.

In any case, this depiction graphically shows that Volotea's network is clearly Point-to-Point and has no centralisation point for all destinations.

Having analysed these parameters, and taking into account that the company's website does not advertise stopover flights, it can be concluded that Volotea operates its flights using a **Point-to-Point network** system.

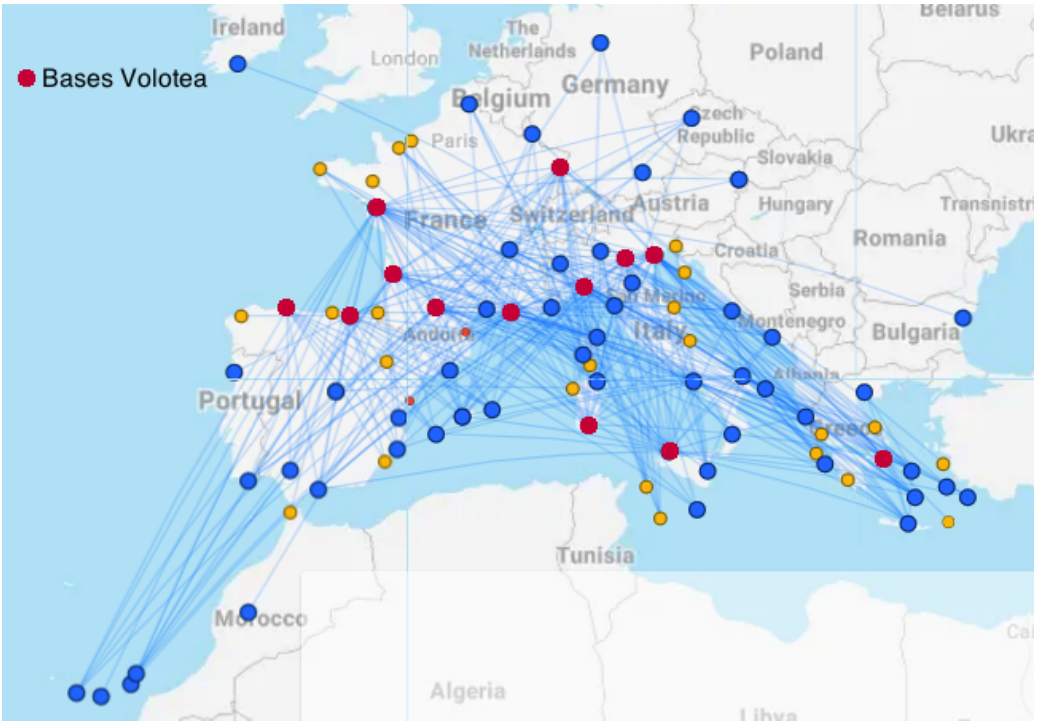


Figure 4.3: Volotea's Network [6]

4.1.4 Attended Routes

Longest and shortest routes

Despite the fact that its network covers a territory of more than 4000km, Volotea does not reach the four-hour-limit in its flights and does not reach the 3000km range. The shortest ranges are are around 200km in length and most of them are from mainland Europe to islands in the Mediterranean Sea. This data is framed in Table 4.2.

Route	Distance	Time
Lanzarote - Strasbourg	2832 km	4h
Santorini - Nantes	2527 km	3h 51min
Tenerife - Nantes	2491 km	3h 45min
Athens - Santorini	217 km	50h
Bari - Dubrovnik	203 km	55min
Athens - Mykonos	135 km	45min

Table 4.2: Volotea's longest and shortest flights [6]

The fact that many bases are spread along an extended geography – not just a region – enables the company to fly in a wide-spread area without having to use aircraft with longer ranges to do so. In this case, as stated before, Volotea has bases extended all throughout the

countries bathed by the Mediterranean, which enables it to be present along more than just the 2500km territory with medium-range aircraft (as will be seen in Section 4.1.6).

Distances flown

Figure 4.4 gathers which percentage of Volotea's flights fly which distances.

Figure 4.4: Distances operated by Volotea's flights [6]

The graph shows that more than 86% of Volotea's flights cover distances shorter than 1500km. Specifically, 75% of its flights would be covering a distance between 500km and 1500km.

Although the average distances of all routes is of 1023km, it is important to account for its distribution as the biggest concentration of flights, a 42% is actually found in lower distances – between 500km and 1000km.

This leaves Volotea classified as attending **medium-haul routes**, although tending to the lower limit.

4.1.5 Frequencies

Weekly and daily flights per route

Figure 4.5 shows that 66% – two thirds – of Volotea's routes are flown two or less times per week.

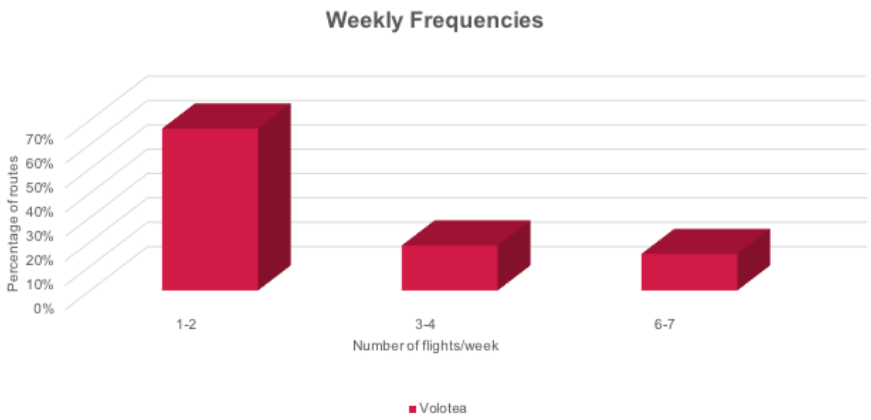


Figure 4.5: Weekly frequencies from Volotea [6]

When it comes to the daily number of flights performed on a given route, 93% of routes operated by Volotea are flown just once per day, as shown in Figure 4.6.

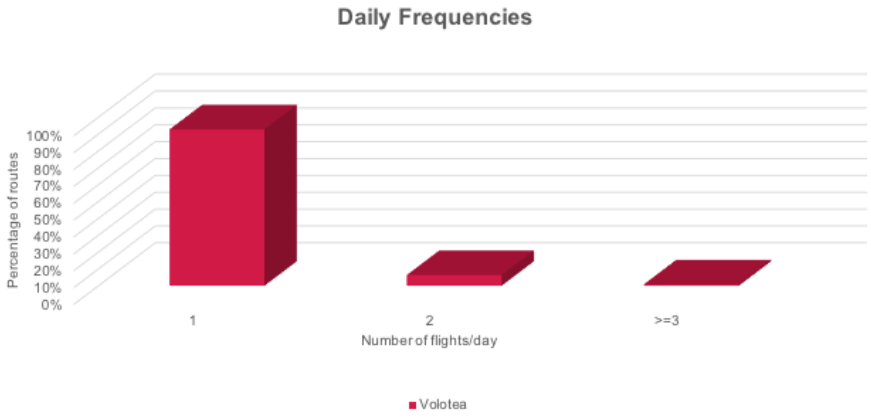


Figure 4.6: Daily frequencies from Volotea [6]

Seasonality

Only about 20% of the flights from Volotea are operated during the whole year. Another 35% flies only around the Summer months (June, July, August and September) and another 40% flies during the months of April, May, June, July, August, September and up to late October/early November.

Other routes, essentially those to destinations with warm weather all-year-round, such as the Canary Islands, only operate during the Winter months.

This last parameter analysis shows that Volotea flies **low frequencies**, both on a weekly-

and daily-basis, and that the airline is **highly seasonal**, although it combines it with a reasonable number of flights going on all-year-round.

4.1.6 Fleet Characteristics

Models

Table 4.3 shows the aircraft models the airline owns. The fleet characteristics are not only relevant to understand the present operations of the airline, but also to hint its plans for future operations.

Aircraft	In Service	Ordered	Avg. Age [years]	Capacity [PAX]	Range [km]
Boeing 717-200	14	—	17,1	125	3815
Airbus A319-100	19	4	15,9	150-156	6950
Totals	**33**	**4**			
Averages			**16,4**	**143**	**5620**

Table 4.3: Volotea's fleet [11]

At first glance, what attracts attention of this fleet is the difference in aircraft models. One would tend to think that for an airline with low ticket prices – as is Volotea – would prioritise simplicity and commonality of the fleet, as happens with a LCC.

Although Volotea has just two aircraft types, they are from different aircraft manufacturers. However, Carlos Muñoz stated that the airline would "definitely migrate entirely out of the 717 and entirely into the A319 in the next two or three years"[50].

This aircraft also has the particularity that, although it is shorter in length than other members of the A320 family (the A320 and A321), it reaches further ranges – meaning new further-away markets. Although A319s have a more limited capacity than its other family members, it does increase by a 20% the capacity of Volotea's existing fleet.

Taking into account that the average age for a commercial aircraft is around 11 years, Volotea's fleet can be considered rather old.

The fact that an airline aimed at smaller markets has airliners in its fleet is eye catching, but further remarks in this line will be discussed in the comparisons carried out in the following chapters.

Ranges

As seen in Table 4.3, Volotea's fleet's average range is 5620km. The Boeings 717 reduce the average range, so in the case that the entire fleet shifted to A319s, this average range would go up to 6950km. This range would be in the medium-range for a commercial jet aircraft.

This would also mean that Volotea has no long-term intention of flying much longer routes than it already is.

Capacities

As seen again in Table 4.3, Volotea's average capacity is of 143 passangers. This corresponds, again, to a small capacity in a commercial airliner. And if the airline happens to homogenize the fleet to all A319, it would also mean that it has no intention of transporting more people per flight.

Volotea's **fleet** will be therefore classified as **heterogeneous** as of February of 2020 and composed by **small-sized airliners**, in terms of aircraft size.

4.2 Volotea and LCCs

4.2.1 Attended Destinations

Target market

As described in Section 2.2.3 in the Literature Review, a LCC's target customer is typically a frequent traveler on a budget or a holiday traveler and this is reflected in Wizz Air's customers.

Wizz Air's statistics show that the average age of its passenger is 34 years old with a 51% of the passengers being between ages 35 and 49. 47% would be College graduates. In terms of reasons to travel, 60% would be visiting a new country or friends and relatives, 20% would be self-financing businesses or entrepreneurs on work and nother 20% would be working abroad and returning home [51].

Wizzair.com is also one of the world's most visited airline websites, and 96% of their current sales come through digital sales channels [52].

Wizz Air's Destinations

Figure 4.7 shows that Wizz Air has presence in virtually every country in Europe. It also has some destinations in the North of Africa, Middle East and West Asia. In total, it serves 144 international destinations in 44 countries, as of February 2020 [6].

Figure 4.7: Destinations operated by Wizz Air [7]

The airline company has more presence in some countries than it does in others, but, *a priori*, it looks like it flies all sort of destinations, independent of the airport size and location.

Airports Operated

As there is only access to Spanish AENA Statistics, this study has been performed on the airports that Wizz Air operates in Spain. Out of the 34 airports studied, it just flies to 11 of them. Out of these 11 airports, 6 of them are classified as airports that host more than 10M passengers a year.

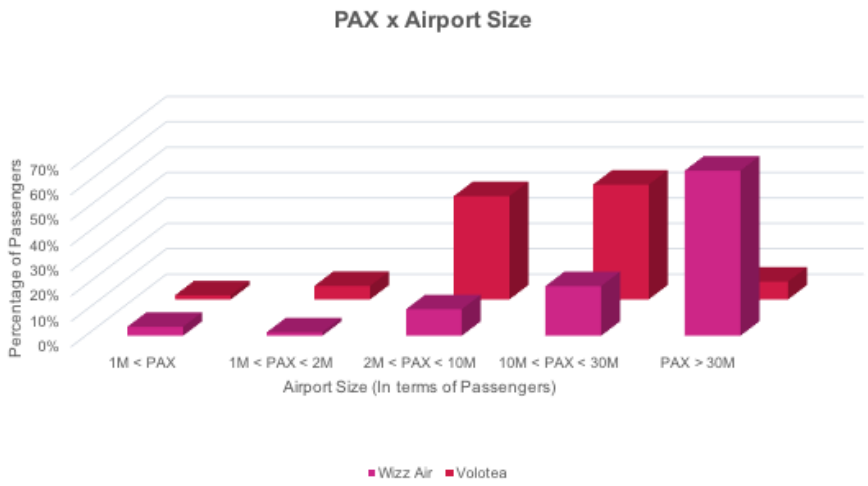


Figure 4.8: Percentage of passengers flown by Wizz Air and Volotea to airports of different sizes [5]

As seen in Figure 4.8 a 95% of the passengers it flies from and to Spain go through airports that hold more than 2M passengers yearly. This is, medium- to big-sized airports. In particular, a 65% of passengers are destined in airports that hold more than 30M passengers a year – this is, Madrid and Barcelona.

The graph also shows an obvious difference with respect to the airports that Volotea attends the most.

Wizz Air can be then classified as an operator of **big-sized airports**.

4.2.2 Attended Area

Limits of the network

As pointed out before, the airline has a presence all over the European Continent.

The network's limits stand in Dubai to the South through to Tromso to the North, to Reykjavik to the East and Nur-Sultan to the West. From its farthest-apart points, the extension is of almost 7500km.

This extension is almost double than that of Volotea.

The **extension of the network** of Wizz Air can be considered as **continental**, although it does reach some points outside Europe.

4.2.3 Network Topology

Airport bases

Table 4.4 shows the bases of Wizz Air and instead of having a classification in Table 4.4 for "Bases (in) Spain" (as with Volotea), it will have a classification for bases in its country of origin, which is Hungary.

The airline has a total of 26 bases, mostly and roughly scattered from north to south along Eastern Europe. This number of bases makes sense as to the traffic that Wizz Air flies. Unlike Volotea, many of these bases are capital cities or medium- to large-sized cities.

However, as seen in Section 4.1.3 for Volotea, Wizz Air has no hubs and just two of its bases are in its home country. Actually, these two bases constitute the only two domestic destinations of the airline. Wizz Air therefore has a bigger presence in countries abroad, as Volotea. Even so, its largest base is kept in Hungary: Budapest Airport serves 68 destinations – the base that, by far, serves the biggest number of routes – and the majority of the bases are placed in its neighbour country, Romania.

WIZZ AIR		
Hub	**Bases Hungary**	**Bases Abroad**
–	Budapest	Katowice
	Debrecen	Belgrade
		Bucharest
		Cluj-Napoca
		Gdansk
		Kiev
		Skopje
		Sofia
		Targu Mures
		Timisoara
		Vilnius
		Wroclaw
		London Luton
		Riga
		Kutaisi
		Varna
		Warsaw-Okecie
		Kishinev
		Tuzla
		Craiova
		Sibiu
		Iasi
		Vienna
		Krakow-Balice

Table 4.4: Wizz Air's bases [7]

Degree Centrality

Table 4.5 shows both Wizz Air's and Volotea's Degree Centrality. As happens with Volotea, the value for Wizz Air is closer to the Point-to-Point side of the spectrum of network types. As it is higher than Volotea's, it indicates a slightly higher centralisation of its operations.

Airline	Degree Centrality
Wizz Air	0,41
Volotea	0,32

Table 4.5: Degree Centrality of WizzAir and Volotea

Network Configuration

Figure 4.9 shows the whole network from Wizz Air. In the same way Volotea is spread horizontally along the South of Europe, Wizz Air is distributed vertically along the East of Europe, having covered the area of its geographical predominance. Although it looks like the bases of Wizz Air are more concentrated if taken into account the wider extent from West to East of its network.

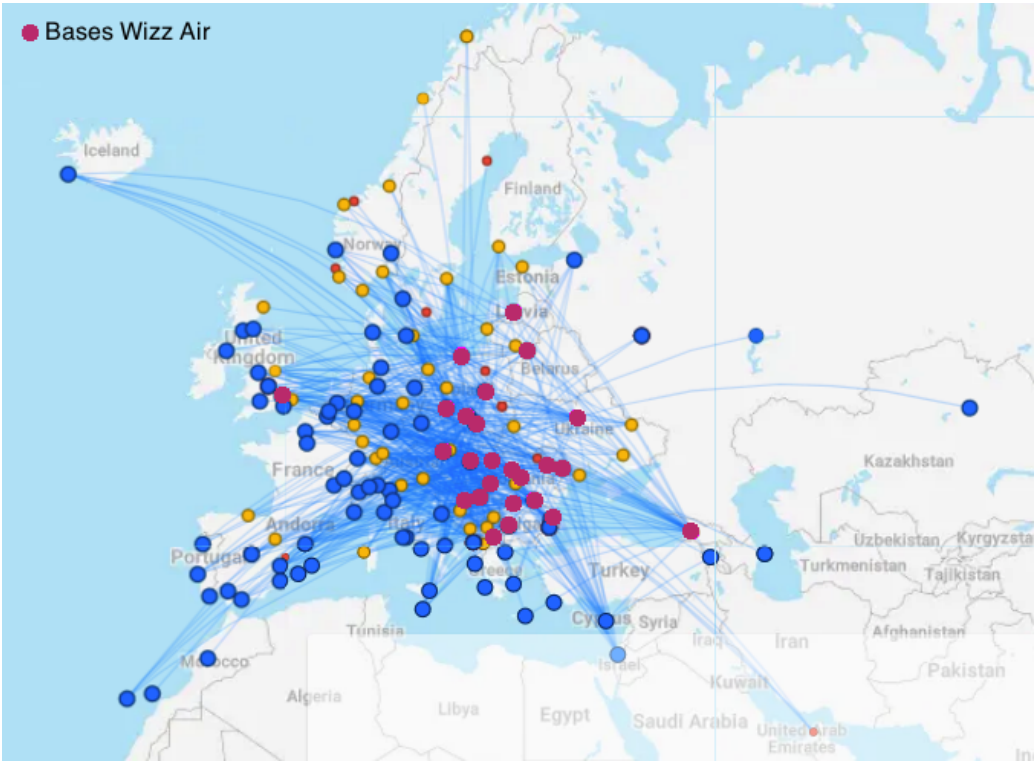


Figure 4.9: Wizz Air's Network [6]

Wizz Air does not advertise stopover flights either and the parameters point out, again, that it follows a **Point-to-Point network**.

4.2.4 Attended Routes

Longest and shortest routes

Table 4.6 shows the longest and shortest routes that Wizz Air flies.

The longest routes of the airline are little more than 4100km. These are almost double in range as Volotea's. Most of them either reach the Canary Islands or the Middle East from Eastern Europe.

The shortest routes are also almost double in length to Volotea's and are flights between different countries.

Route	Distance	Time
Katowice - Dubai	4192 km	5h 45min
Tenerife - Bucharest	4183 km	5h 30min
Warsaw - Tenerife	4093 km	5h 35min
Budapest - Targu Mures	406 km	1h
Katowice - Lviv	356 km	1h
Gdansk - Malmo	349 km	1h

Table 4.6: Wizz Air's longest and shortest flights [6]

Distances flown

Regarding the distances that Wizz Air flies, only 1% of its routes are shorter than 500km in length. The length of the rest of flights are more or less equally spread, being around 20% the flights between 500km and 100km; between 1500km and 2000km; and of more than 2000km each. The remaining 40% of flights would be between 1000km and 1500km.

When compared to Volotea's distribution, it is noticeable that Wizz Air operates longer-haul routes, it having 77% in the medium- to long-end of the intervals and Volotea concentrating its flights rather at the lower end. They do both, though, operate many flights in the 1000km to 1500km range.

Wizz Air is therefore classified as attending rather **medium-haul routes** – although tending to longer distances.

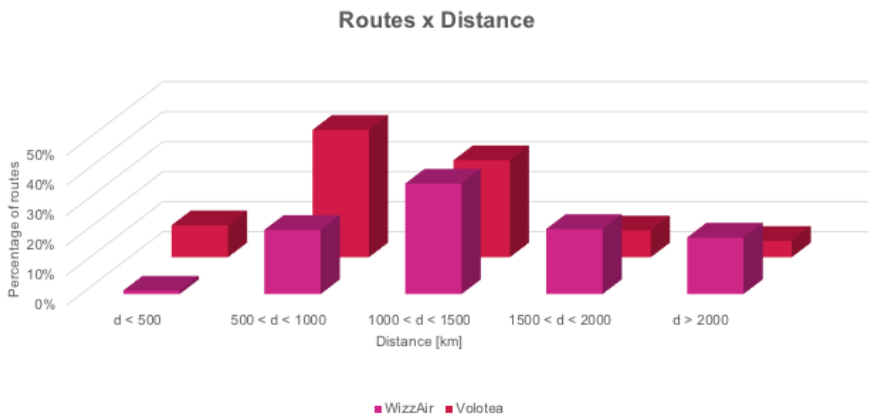


Figure 4.10: Distances operated by Wizz Air's flights compared to Volotea's [6]

4.2.5 Frequencies

Weekly and daily flights per route

As seen in Figure 4.11, Wizz Air's number of flights per week is low. Unlike Volotea, though, that has a majority of weekly frequencies of one to two flights per week, Wizz Air's routes are flown up to that four times per week.

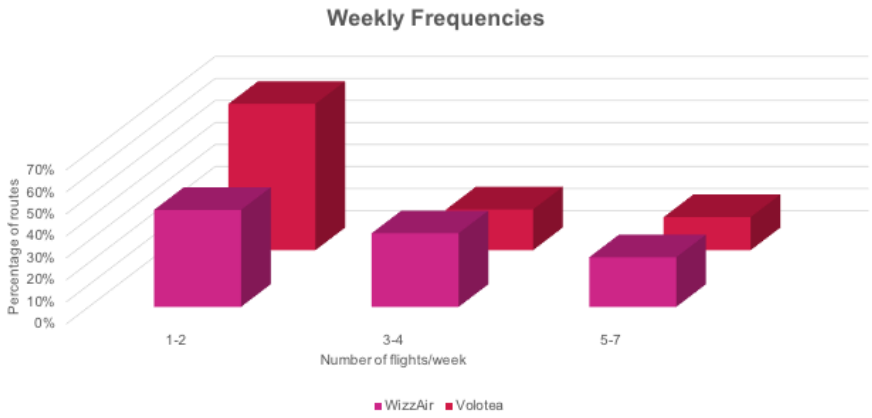


Figure 4.11: Weekly frequencies from Wizz Air compared to Volotea's [6]

Regarding the daily number of flights for a given route, the tendency is pretty much the same as Volotea. A 93% of its routes are also flown just once a day, as shown in Figure 4.12.

Seasonality

Wizz Air has less than a 10% of seasonal flights.

This is a big difference with regards to Volotea's highly-seasonal operations structure.

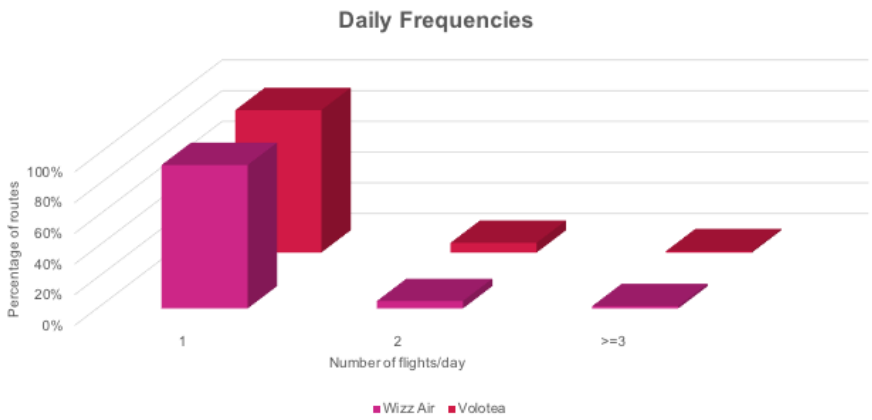


Figure 4.12: Daily frequencies from Wizz Air compared to Volotea's [6]

A conclusion for this parameter would be that Wizz Air flies **medium-frequencies**, with **low daily frequencies for one route** and with **year-round routes**.

4.2.6 Fleet Characteristics

Models

Table 4.7 shows Wizz Air's fleet's basic specifications.

Aircraft	In Service	Ordered	Avg. Age [years]	Capacity [PAX]	Range [km]
Airbus A320-200	69	—	7,9	180	6150
Airbus A320neo	—	1		TBA	6300
Airbus A321-200	34	—	2,9	230	7400
Airbus A321neo	8	2	0,8	239	7400
Totals	**111**	**3**			
Averages			**5,9**	**200**	**6620**

Table 4.7: Wizz Air's fleet [11]

The average age of Wizz Air's fleet can be considered young.

These aircraft are all from the same family – the A320 family, all narrow-body airliners designed and produced by Airbus. This fits exactly to an LCC fleet strategy, as it lowers costs of maintenance and operation significantly.

The "neo" versions are just the same aircraft but equipped with more environmentally-friendly engines, which save 20% fuel burn per seat, as well as save payload and therefore

extends range, lowers operating costs, noise and NOx emissions by 50

Volotea's A319 would belong to this A320 family too, although it is a shorter version.

Ranges

The average range of 6620km corresponds to a short-to-medium haul range. Although the airline has three (en route to four) aircraft types, there is not much of a difference in ranges between them. The 7400km-range airliners may be used to reach longer distances but there is not much variation. In any case, Wizz Air's fleet can, for the moment being, reach longer distances than Volotea's fleet.

Capacities

Capacity numbers show a bigger difference to Volotea's fleet capacity as Wizz Air transports 200 passengers per flight in average and Volotea, 143.

Hence, Wizz Air is composed by an **homogeneous fleet** of **medium-sized airliners** of one same family and manufacturer.

4.3 Volotea and Hybrid Carriers

4.3.1 Attended Destinations

Target Market

Vueling aims to cover the largest market share by addressing all ranges of age and social class. They offer notably low prices, which mainly attract leisure travellers and visiting friends and relatives-type travellers.

Apparently, the amount of business customers and families flying Vueling has increased and the airline has designed specific fares for these customers. For this reason, the airline has started to offer fares designed especially for these customer types. In particular, these fares include agility and flexibility in reservation changes for business travellers; and comfort and seats next to each other for families.

As well as selling tickets online, Vueling works with GDSs and agencies.

Vueling's Destinations

The map in Figure 4.13 shows the destinations operated by Vueling. The airline serves 28 domestic destinations and 91 international destinations in 32 countries, as of February 2020 [6].

It looks like Vueling flies a variety of cities in each of the countries it flies to, including their capital city.

Airports Operated

Figure 4.14 shows which size of airport Vueling flies the majority of its passengers to.

Out of the 34 airports studied, Vueling flies 30. 23 of them host less than 10M passengers per year.

The results display that more than 90% of Vueling's passengers move through airports in Spain of more than 2M passengers. In fact, 50% of them are flown to/from big airports, and specifically 48% pass through Barcelona, its hub.

Given that Spain is Vueling's biggest market – where it operates the most airports and has the most amount of bases – it is considered that this data is representative of the kind of airports it operates abroad. Especially because the airports that it principally operates outside of Spain are also big airports.

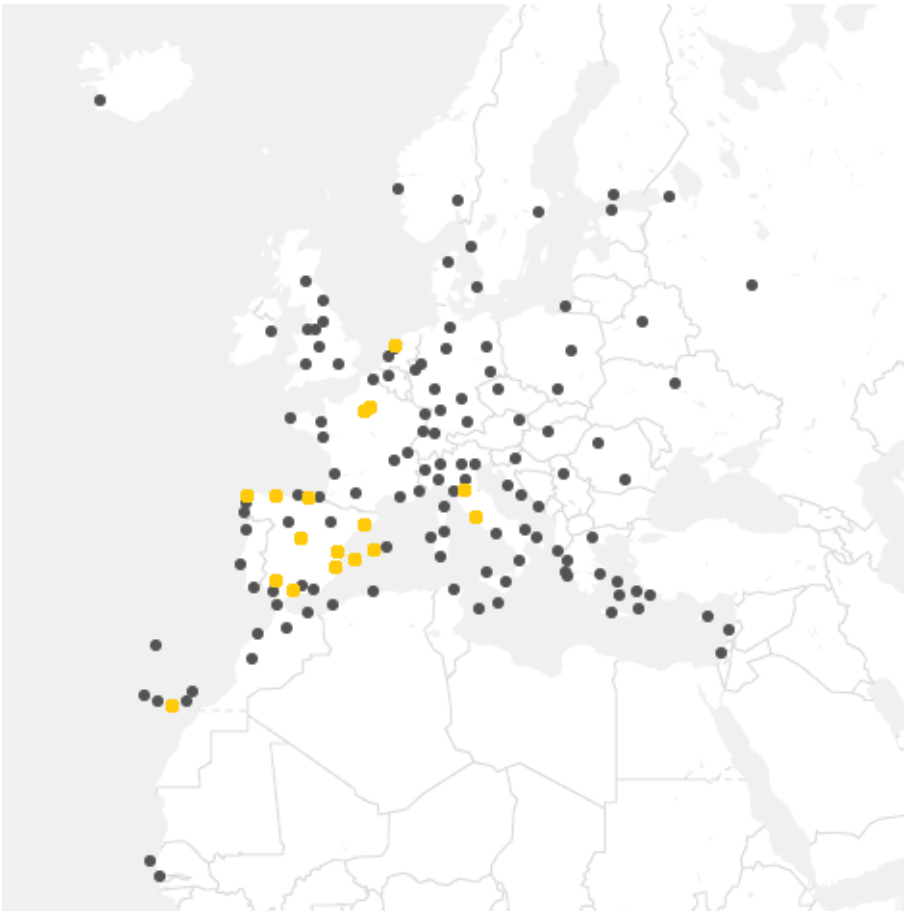


Figure 4.13: Destinations operated by Vueling [8]

This is a difference with Volotea as it carries its passengers to smaller mid-sized airports.

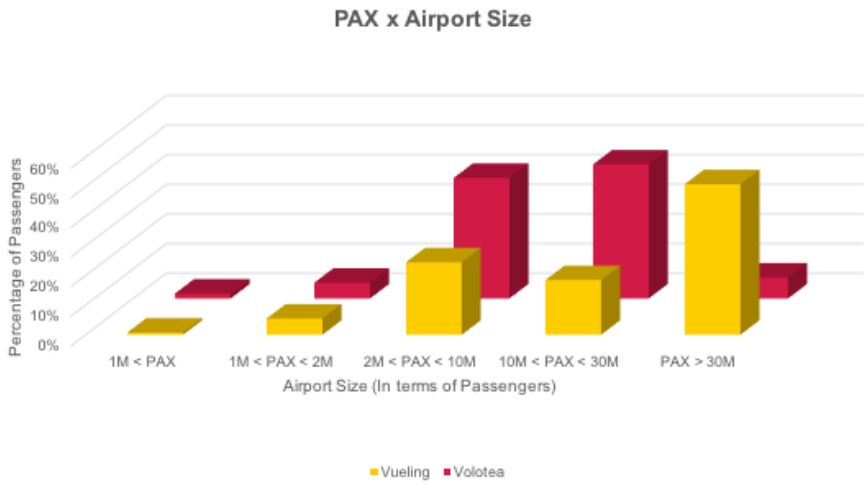


Figure 4.14: Percentage of passengers flown by Vueling and Volotea to airports of different sizes [5]

Vueling's **attended destinations** will be therefore considered as **big-sized airports** within the framework of continental flights.

4.3.2 Attended Area

Limits of the network

Vueling mainly operates Southern and Western Europe, although it has some flights to big cities in Northern and Eastern Europe as well as Iceland, the Middle East and Africa.

The airline's most further-apart points of the network are Banjul to the South, Reykjavic to the West and North and Moscow to the East. This covers more than 6500km in its maximum extension from end to end.

Even though this geography is very similar to Volotea's, many of its destinations also reach outside (continental) Europe.

Vueling's **area of operation** will be therefore considered as **continental**, even though it, again, operates some destinations in the Middle East and Africa (not just its north, but also its west part).

4.3.3 Network Topology

Airport bases

Table 4.8 shows the bases from Vueling. These are 17 in total plus one hub.

Vueling's bases show some differences to Volotea's:

1. Vueling has a hub: this highlights the fact that Vueling operates a Hub and Spoke network. In fact, the airline offers flights with stopovers in Barcelona. This is one of the things that makes Vueling a Hybrid, as this is a feature of FSCs. Comparing Vueling to Volotea in this aspect, the difference is also clear.

VUELING		
Hub	**Bases Spain**	**Bases Abroad**
Barcelona	A Coruña	Rome
	Alicante	Florence
	Sevilla	Paris-Orly
	Bilbao	Paris-CDG
	Madrid	
	Valencia	
	Málaga	
	Santiago	
	Gran Canaria	
	Tenerife Norte	
	Asturias	
	Ibiza	
	Mallorca	

Table 4.8: Vueling's bases [11]

2. Bases from Vueling out of Spain are mainly capital cities. This just points out that, if compared to Volotea, the airline is flying different-sized airports, at least out of Spain.

   It also alligns with the results obtained in Section 4.3.1 – most of the operations from Volotea take place in medium-sized airports whereas Vueling's are in high-traffic airports – this would include its Hub in Barcelona too.

3. Most of Vueling's bases are in Spain. This does not necessarily describe a difference in business model, but just points out the fact that Vueling's market is focused in Spain, while Volotea's is not.

4. Vueling has a similar number of bases to Volotea. Although Vueling flies a bigger volume of passengers, it has a similar number of bases to Volotea.

Degree Centrality

Airline	**Degree Centrality**
Vueling	0,85
Volotea	0,32

Table 4.9: Degree Centrality of Vueling compared to Volotea's

The result for the Degree Centrality in Table 4.9 shows a big distancing from the theoretical LCC business model that Vueling supposedly followed in its origins. This value is really close to 1, which would mean a network that works similarly to a fully-integrated H&S network, unlike Volotea.

Network Configuration

All in all, regarding the network type, Vueling is closer to the H&S type, especially when taking a detailed look at the routes departing/arriving Barcelona in Figure 4.15.

Figure 4.15: Vueling's routes from Barcelona [6]

Vueling has a third of its routes with one of its ends in Barcelona – 107 in total –, so it is evident that the network is highly centralised in this point. In fact, the countries at the

perimeter of Vueling's network are just connected through their capital cities to Barcelona.

However, the network combines this with other Point-to-Point flights, mainly from its other bases. Many of these flights – almost 30% – connect the cities within Spain and about 50% connect Spain with destinations abroad.

Given these results, Vueling's **network** is defined as **Hub and Spoke network**.

4.3.4 Attended Routes

Longest and shortest routes

Table 4.10 collects the airline's longest and shortest routes.

The shortest routes are similar in length to Volotea's and are within one country too. The longest routes, though, are much longer than Volotea's – these always have Barcelona in one of its end points and are flown either to North Africa or the Middle East.

Route	Distance	Time
Barcelona - Banjul (Gambia)	3600 km	5h 10min
Barcelona - Dakar	3489 km	5h 15min
Barcelona - Tel Aviv	3082 km	4h 20min
Barcelona - Mallorca	203 km	55min
Valencia - Ibiza	172 km	50min
Ibiza - Alicante	169 km	50min

Table 4.10: Vueling's longest and shortest flights [6]

Distances flown

Figure 4.16 shows the distances operated by Vueling's flights.

The distribution is quite similar to that of Volotea. Vueling flies a high percentage of routes that are longer than 1500km but it concentrates the majority of its flights between 500km and 1500km.

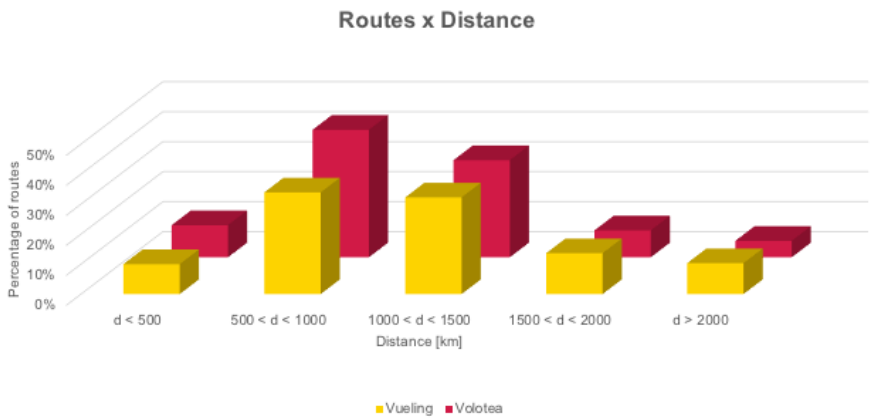


Figure 4.16: Distances operated by Vueling's flights compared to Volotea's [6]

This leaves Vueling classified as attending **medium-haul routes**.

4.3.5 Frequencies

Weekly and daily flights per route

Figure 4.11 shows that Vueling operates almost half of its routes 5 to 7 days a week, while the other half either between 1 and 2 days or 3 and 4 days a week. This is a big difference with Volotea, that operates most of its flights 1 to 2 times a week.

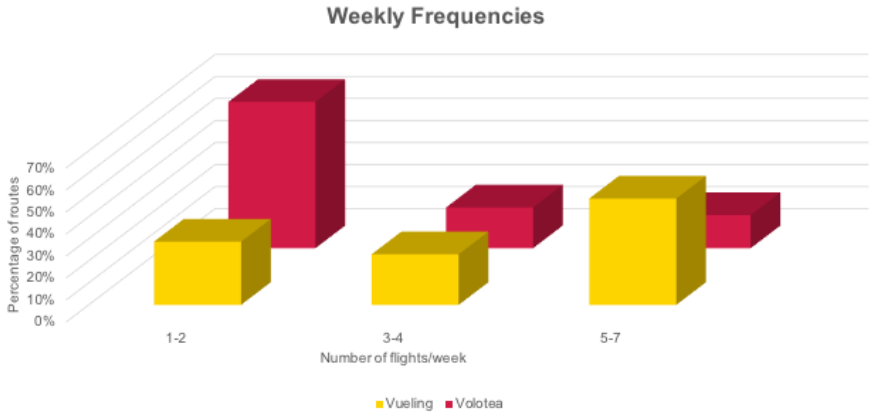


Figure 4.17: Weekly frequencies from Vueling compared to Volotea's [6]

Figure 4.18 shows that the distribution of daily flights is fairly similar to Volotea's, although with a slightly bigger number of routes flying more than once per day.

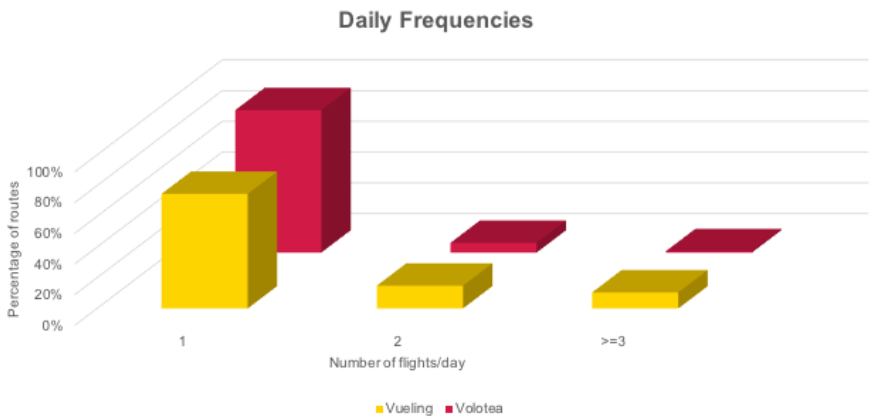


Figure 4.18: Daily frequencies from Vueling compared to Volotea's [6]

Seasonality

The seasonality index is also really low for Vueling. Not even 10% of its routes are seasonal and these just occure during the summer season. This is also a big difference to Volotea.

Vueling flies **high-frequencies**, with **low daily frequencies for one route** and with **year-round routes**.

4.3.6 Fleet Characteristics

Models

Table 4.11 shows Vueling's fleet.

Aircraft	In service	Ordered	Avg. Age [years]	Capacity [PAX]	Range [km]
Airbus A319-100	6	—	13,2	144	6950
Airbus A320-200	79	1	8,7	180/186	6100
Airbus A320neo	23	2	1,2	186	6500
Airbus A321-200	15	—	4	220	5600
Totals	**123**	**3**			
Averages			**6,9**	**188**	**6155**

Table 4.11: Vueling's fleet [11]

The airline has a relatively young fleet with 6,9 years in average, with very new A320neos.

Again, as occured with Wizz Air, Vueling has just aircraft of one manufacturer and one family: the A320s in different sizes. One of them, the A319 actually coincides with Volotea's.

Ranges

Vueling's fleet has an average range of 6155km and again, the variation in ranges is not too big. This range does not differ too much to Volotea's – both have short to medium range aircrafts.

Capacities

Vueling can also transport up to 45 people more in average per flight, 188 passengers, when compared to Volotea.

Vueling's **fleet** is therefore **homogeneous** and consists of **medium-sized aircraft** of one same family and manufacturer.

4.4 Volotea and Regional Feeders

4.4.1 Attended Destinations

Target Market

Air Nostrum's customers are Iberia's customers, as the majority of flights that the airline operates are purchased through Iberia's website – although Air Nostrum sells out tickets from its own website too. These customers want to fly from a small- or mid-city to Madrid or to some other place with a stopover in Madrid.

Air Nostrum's magazine is very regional-oriented and stands out the particularities of its destinations, such as local parties or so on, to stimulate the interest of travel to these places.

Air Nostrum's Destinations

Figure 4.19 shows the destinations that Air Nostrum operates. The airline serves 26 domestic destinations and 16 international destinations in 7 countries, as of February 2020 [6].

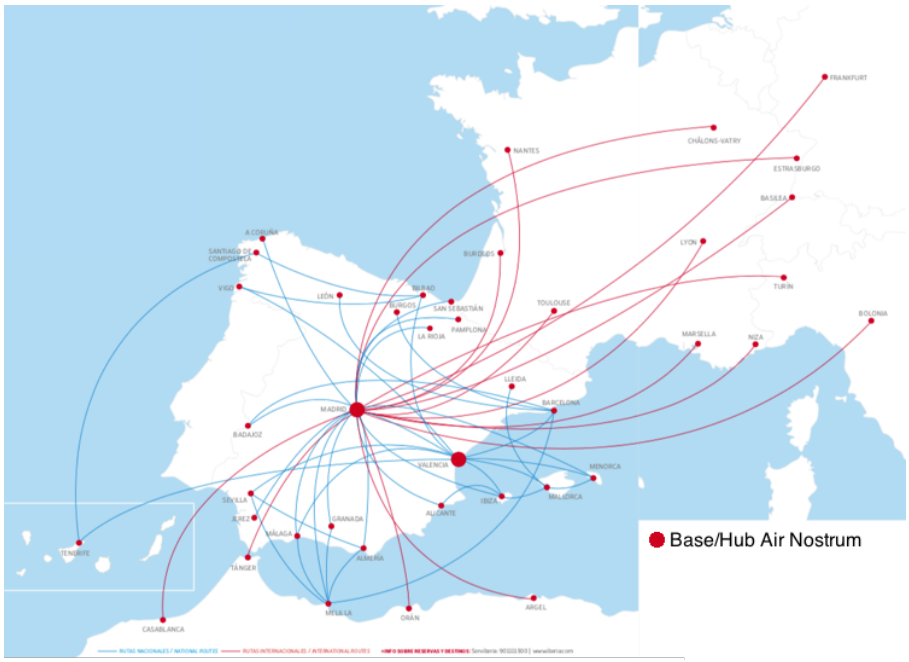


Figure 4.19: Network operated by Air Nostrum [9]

Except for Algiers and Madrid, the airline flies no other capital city and limits its operation to small- or medium-sized cities.

Airports Operated

Figure 4.20 shows the passenger to airport size statistics from both Air Nostrum and Volotea.

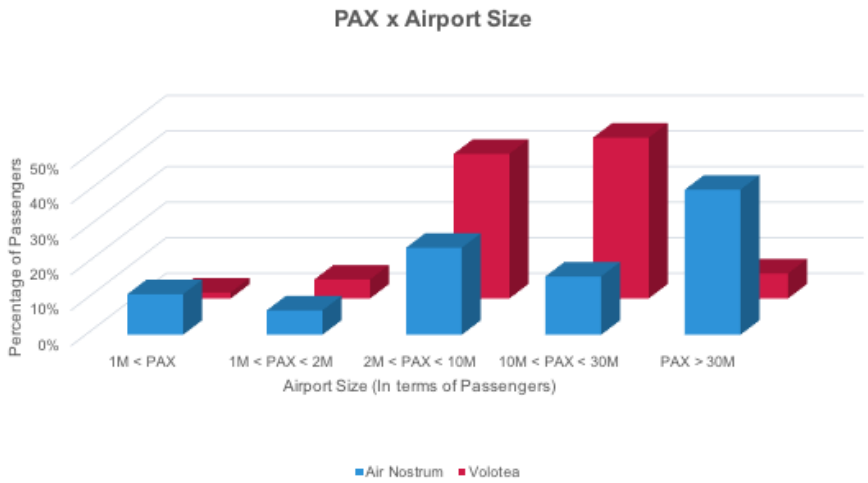


Figure 4.20: Percentage of passengers flown by Air Nostrum and Volotea to airports of different sizes [5]

Out of the 34 airports studied, Air nostrum flies 31, 25 of which host less than 10M passengers per year. This is, 80% of its routes are flown to small or medium-sized airports.

However, a 40% of its passengers go through big airports that host more than 30M passengers per year. This 40% actually represents almost exclusively the amount of passengers that Air Nostrum flies to or from Madrid, Iberia's hub. The rest of pasengers are flown in similar numbers to all other airport sizes.

This is also a big difference with regard to Volotea, who only flies 7% of its passengers through airports such as Madrid or Barcelona.

Air Nostrum's **attended destinations** will be therefore considered as **medium- to big-sized airports**.

4.4.2 Attended Area

Limits of the network

In the majority of the cases, the destinations flown by Air Nostrum are domestic, but there is also one destination in Germany plus others in neighbour countries in North Africa, France and Italy.

The end points of Air Nostrum's network would be Tenerife to the south and west, Frankfurt to the north and Bologna to the east. The biggest linear distance between its farthest-apart points is more than 3000km.

This area is smaller to Volotea's – as Air Nostrum still needs to reach the Canary Islands, its area is similar to Volotea's when compared from South to North, although Volotea's area extends more to the West when compared in width.

The **area covered** by Air Nostrum can be described as **regional**, as it just its national frontiers plus some additional destinations nearby.

4.4.3 Network Topology

Airport bases

Air Nostrum's bases are found in Table 4.12.

Hub	Bases Spain	Bases Abroad
Madrid	Valencia	–

Table 4.12: Air Nostrum's bases [12]

There are a few comments to make regarding these results:

1. Given that this regional type is a Feeder and works within the H&S network of a FSC – Iberia – it is expected that Air Nostrum has a hub – Iberia's Hub.
2. Given that the Feeder already has a hub, and as a small carrier, it is unusual that it has another base in a different airport than that where its hub lies on. However, its maintenance and operations base is in the airport of Valencia as it is there where the airline was founded.

3. It is not unusual that the airline has no bases abroad, given that it is still a regional and it just operates mainly in the country region.

Given this description of the bases of Air Nostrum, there are many differences with those of Volotea. To start off, Volotea does not have a hub. It also has many more bases in general and the majority of them are outside of Spain.

Degree Centrality

The degree centrality of Air Nostrum is found in Table 4.13.

Airline	Degree Centrality
Air Nostrum	0,68
Volotea	0,32

Table 4.13: Degree Centrality of Air Nostrum compared to Volotea's

Air Nostrum has a value above 0,5 which means that its network rather resembles a Hub and Spoke system.

This makes sense because, as described in the Literature Research, the Feeder connects regional airports to a hub as part of the H&S network of another FSC company. However, as Air Nostrum also flies some Point-to-Point routes that connect regional cities between them, that is why the degree centrality value may not be that close to 1.

Network Configuration

50% of Air Nostrum's routes have an end point in Madrid. Out of these, 50% are domestic flights – the remaining 50% are the whole of Air Nostrum's international routes (25% of its total routes), as they only depart from the hub, Madrid.

While most destinations from its network have just 1 or 2 connections, Madrid is connected to 29 cities, just followed by Valencia, connected to 10.

Again, although Air Nostrum is a Regional Carrier, its subclassification into a Feeder is very defining of its operations – which take the form of a H&S network as seen in Figure 4.19.

Yet again, Volotea has been defined as operating Point-to-Point with a very different network concept.

Air Nostrum's **network** mostly resembles a **Hub and Spoke**.

4.4.4 Attended Routes

Longest and shortest routes

Table 4.14 shows the longest and shortest routes that Air Nostrum operates.

Route	Distance	Duration
Tenerife - Valencia	1900 km	2h 55min
Tenerife - Santiago de Compostela	1740 km	2h 45min
Madrid - Frankfurt	1423 km	2h 40min
Bilbao - Santiago	141 km	50min
Ibiza - Alicante	169 km	50min
Ibiza - Mallorca	141 km	50min
Mallorca - Menorca	119 km	45min

Table 4.14: Air Nostrum's longest and shortest flights [6]

The shortest routes for this case are very short – joining two islands from the same archipelago. Regarding the longest routes, they are domestic flights to or from the Canary Islands. These are domestic flights but are still in the African continent, so they are quite long for a Regional Carrier.

If the routes to the Canaries were not taken into account, the longest routes would be those parting from Madrid to some other place in Europe – all below 1500km in length.

Regarding the shortest routes, they are either interinsular or between nearby regions. In any case, within the same country and of similar length to Volotea's shortest routes.

Actually, an 85% of routes are flown between Spanish regions and the rest connecting Madrid to some other destination.

Distances flown

Figure 4.21 shows that most of the routes flown by Air Nostrum, namely a 52%, are less than 500km away, while 42% of Volotea's routes are between 500km and 1000 km away. All of its routes longer than 1500km are within Spanish territory as, again, the Canary Islands are also part of the "regional" geography.

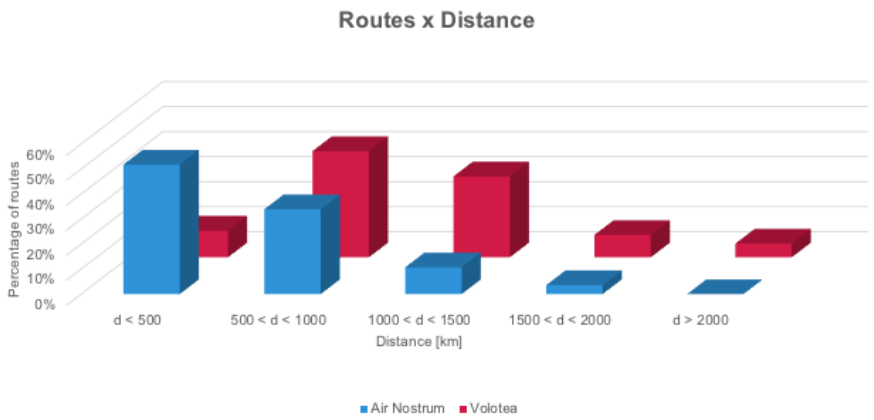


Figure 4.21: Distances operated by Air Nostrum's flights [6]

It can therefore be concluded that Air Nostrum flies **short-haul routes**.

4.4.5 Frequencies

Weekly and daily flights per route

Figure 4.11 shows that almost 80% of Air Nostrum's routes are flown from 5 to 7 times a week. This is a big difference to Volotea, who mainly flies frequencies of 1 to 2 flights weekly.

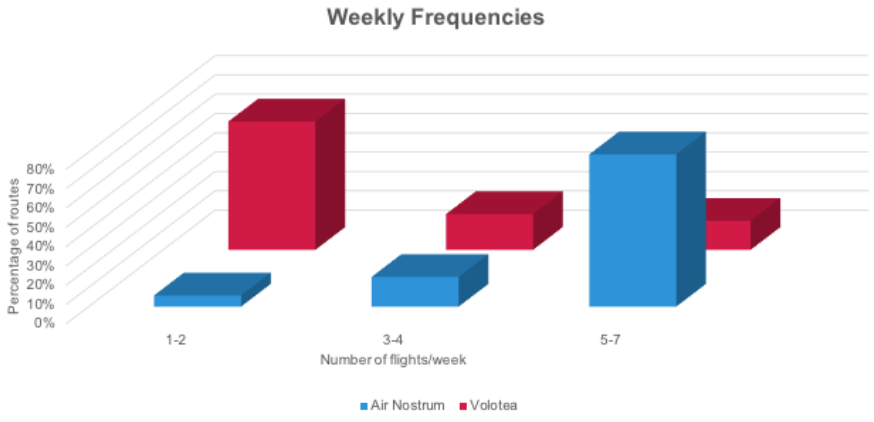


Figure 4.22: Weekly frequencies from Air Nostrum compared to Volotea's [6]

In terms of the daily frequencies, Figure 4.23 shows that Air Nostrum's percentages are more widely distributed as the airline does 40% of its routes once a day, 23% twice a day and 37% three or more times a day. This is also a big difference to Volotea who almost exclusively flies all its routes just once a day.

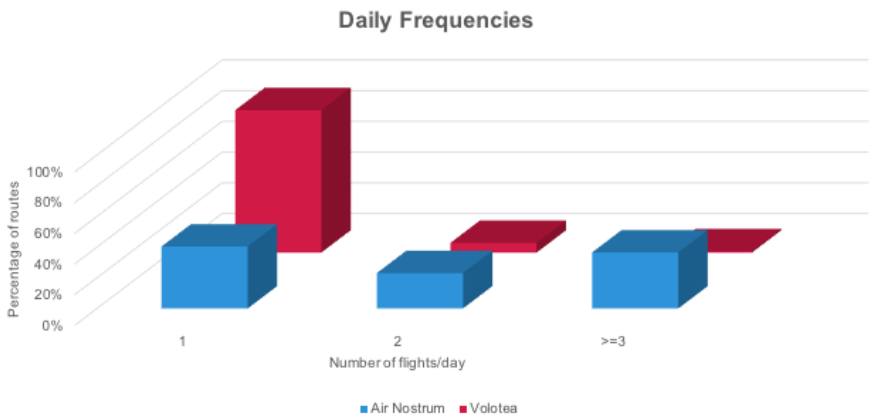


Figure 4.23: Daily frequencies from Air Nostrum compared to Volotea's [6]

Seasonality

In the case of Air Nostrum, 20% of its flights where seasonal in 2019, of which some were operated in December and January and others during the Summer months.

It can therefore be concluded that Air Nostrum flies **high frequencies** and with **low seasonality** routes.

4.4.6 Fleet Characteristics

Models

Air Nostrum operates a fleet of short-range small jets and turboprops of short range as seen in Table 4.15.

Aircraft	In service	Ordered	Avg. Age [years]	Capacity [PAX]	Range [km]
ATR-72-600	11	—	7,2	72	1528
B. CRJ-200	7	—	20,7	50	3045
B. CRJ-900	6	—	13,5	90	2956
B. CRJ-1000	27	—	5	100	2491
Totals	**42**	—			
Averages			**8,6**	**86**	**2414**

Table 4.15: Air Nostrum's fleet [11]

B. stands for Bombardier in all the CRJ Series presented.

The average age of the whole fleet is young – 8,6 years – although the Bombardier CRJ-200, is quite old with 20,7 years old

As the fleet includes an ATR model as well as the CRJ aircraft, the fleet can be considered heterogeneous.

This fleet is very different to Volotea's, whose fleet is composed by airliners, not regional aircraft.

Ranges

The range of these aircraft is for short-haul flights, ranging from 1528km to 3045km, with an average of 2414km between all its models.

Although the ATR makes the fleet heterogeneous, it may be more fitting for the shorter routes as it has a range of 1528km. In general, there is more variety in ranges in this fleet than in the other airlines studied.

This average range is less than half than that of Volotea's (5620 km).

Capacities

The fleet capacities are also in the lower-range. The average number of seats of the aircraft, being 50 the minimum and 100 the maximum, is 86 passengers.

Volotea has more than double this average – up to 143 passengers. This is, Volotea can host more passengers in one flight – a figure closer to what a LCC could carry than a regional.

Air Nostrum's **fleet** is therefore to be considered **heterogeneous** and consists of **regional aircraft**.

4.5 Volotea and Bounded Regionals

4.5.1 Attended Destinations

Target market

Widerøe is a local carrier that operates between smaller towns and cities in Norway and provides flights to the Lofoten Islands and the far north.

Due to Norway's geography, air service is of great importance for smaller communities of Norway's West and North, connected by winding roads, if any.

So, in general, Widerøe targets an average Norwegian who needs to make a displacement within the country, even for a short distance, as alternatives are scarce in many cases.

Widerøe's Destinations

Widerøe's network operates 41 domestic destinations and 9 international destinations in 4 neighbour countries with a total of 244 routes [6].

The airports Widerøe operates are widespread within the whole of Norway. From its international destinations, only Copenhaghen is a capital city. It flies to London too, but to London Southend, one of its secondary airports.

Airports Operated

As there is no flight statistics data of the Norwegian market online and the airline does not fly to Spain, there is no available data to perform this study for Widerøe.

However, taking a look at the airports that the airline operates in its domestic market, just one of them can be considered a medium-sized airport, with 28,6M passengers per year (it does not reach 30M, the lower-end of the interval for the so-called "big airports" in the study performed for the rest of the airlines). The rest of Norwegian airports carry under 6,5M passengers a year. Therefore, it is safe to assume that Widerøe mainly operates small- to medium-sized airports.

In this case, the biggest percentage of passengers would be flown to airports up to 10M passengers per year, while Volotea concentrates its flights in airports from 2M to 30M passengers per year.

Figure 4.24: Widerøe's Network [10]

Wideroe's **attended airports** are **small- to medium-sized**.

4.5.2 Attended Area

Limits of the network

Widerøe's attended geography is clearly different to the rest of the airlines examined. It is just centered in Norway and its neighbour countries at the northern part of Europe in Sweden, Denmark, Germany and UK.

The airline's network ends in Munich to the south, Liverpool to the west, Vardø to the east and Mehamn to the north. In total, around 2500km of network from its farthest-apart points.

This is the airline that covers the smallest area.

The **area covered** by Widerøe is therefore almost exclusively national to its country, so it will be defined as **regional** for the comparison purposes.

4.5.3 Network Topology

Airport bases

Table 4.16 shows Widerøe's bases – 5 in total.

WIDERØE		
Hub	**Bases Norway**	**Bases Abroad**
–	Bergen	–
	Sandefjord/Torp	
	Oslo	
	Bodø	
	Tromsø	

Table 4.16: Widerøe's bases [11]

The bases are also spread along the geography of the country. The airline has no hub and all its bases are within Norway. The bases are more connected in terms of number of routes when compared to the rest of airports, although none of them particularly stands out. For this parameter, a difference to Volotea's base distribution would be that Widerøe has all its bases in just one country.

As a side comment, its international flights are flown from southern airports, namely Sandefjord, Kristiansand, Oslo, Stavanger and Bergen, some of which are not bases.

Degree Centrality

Results from degree centrality of Widerøe are found in Table 4.17.

Widerøe's degree centrality value – 0,39 – is closer to a fully-integrated Point-to-Point network. This is something expected, as Widerøe has been chosen as representative of the Bounded Regional, which, according to the Literature Review, is mostly Point-to-Point.

Airline	Degree Centrality
Widerøe	0,39
Volotea	0,32

Table 4.17: Degree Centrality of Wideroe compared to Volotea's

Volotea has a very similar degree centrality, which makes these two airlines similar in this aspect.

Network Configuration

Figure 4.24 depicts the network as clearly Point-to-Point. There is no identifiable unique base or hub. Most destinations are in fact connected to an average of 4 other destinations, so, in spite of being Point-to-Point with a few number of bases, its destinations are quite interconnected and harnessed.

Volotea also flies Point-to-Point and its destinations are also very interconnected and harnessed with a big focus of routes in its bases.

Wideroe's **network** can therefore be defined as **Point-to-Point**.

4.5.4 Attended Routes

Longest and shortest routes

The distance values in Table 4.18 are all much smaller than those seen for all other airlines. Distances in both Widerøe's longest and shortest routes are definitely much shorter than Volotea's, reaching even less than half their size.

The longest route (in distance) is international - to Munich, while all others remain within Norway. The shortest routes are also within Norway and are particularly short.

It is particular to Widerøe that all of its routes are connected to the country - they are either domestic routes (a 95%) or connect the country with either one of the named international destinations. None are flown within or bewteen other nationalities.

Route	Distance	Duration
Munich - Bergen	1394 km	2h 20min
Oslo (Torp) - Tromsø	1235 km	2h 25min
Tromsø - Bergen	1220 km	2h 25min
Berlevåg - Mehamn	46 km	18min
Vadsø - Kirkenes	39 km	15min
Båtsfjord - Berlevag	32 km	18min

Table 4.18: Wideroe's longest and shortest flights [6]

Distances flown

Figure 4.25 shows that Widerøe operates mainly routes that are less than 500km away, just as the Feeder. These represent an 80% of its routes, while only 16% of its routes are between 500km and 1000km away and 4% between 1000 and 1500. The airline has no flights over 1500km.

This is, again, a big difference to Volotea, whose routes are mainly in the 500km to 1500km interval.

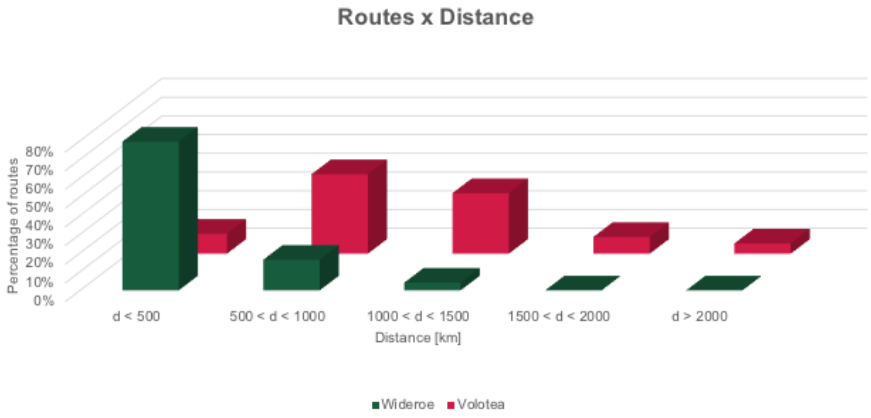


Figure 4.25: Distances operated by Widerøe's flights [6]

The **routes operated** by Widerøe are monstly **short-haul** routes.

4.5.5 Frequencies

Frequencies

Figure 4.26 shows that 80% of Air Nostrum's routes are flown 5 to 7 times a week. This is a big difference to Volotea, who mainly has a frequency of 1 to 2 flights weekly.

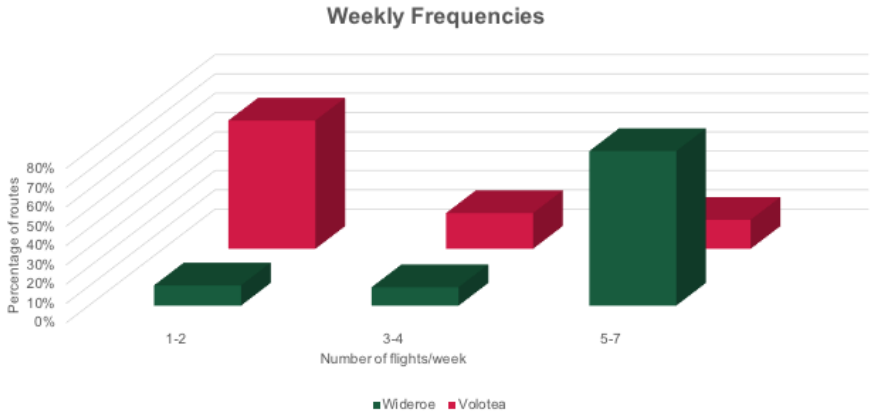


Figure 4.26: Weekly frequencies from Widerøe compared to Volotea's [6]

The distribution of the percentage of routes that are flown daily by Widerøe is similar to Volotea's as shown in Figure 4.6, with most of its routes (a 60%) being flown once a day and the rest evenly distributed between twice or three or more times a day.

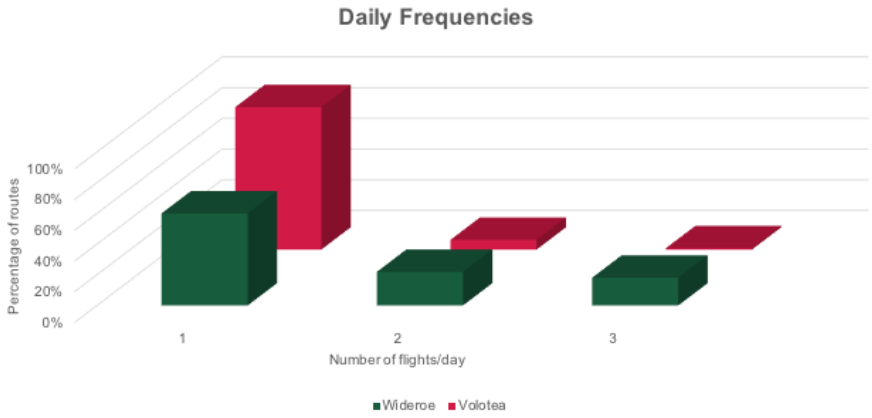


Figure 4.27: Daily frequencies from Widerøe compared to Volotea's [6]

Seasonality

The proportion of seasonal routes for Widerøe is really similar to the Feeder – 20% of the total routes are seasonal: 10% in the Winter months and 10% in the Summer months.

Widerøe flies **high frequencies** and its **non-seasonal** routes.

4.5.6 Fleet Characteristics

Models

Just as with the Feeder, Table 4.19, shows that Bounded Regionals also fly turboprop-powered regional aircraft. This is, again, really different to Volotea's fleet in so that these are aircraft that are specific to fly regional.

Aircraft	In service	Ordered	Avg. Age [years]	Capacity [PAX]	Range [km]
DHC-8-100	25	—	22	39	2084
DHC-8-300	6	—	23,9	50	1711
DHC Dash 8-400	10	—	22,3	78	2040
Embraer 190-E2	3	—	2	114	5280
Totals	**44**	—			
Averages			**21**	**54**	**2241**

Table 4.19: Widerøe's fleet [11]

All DHC correspond to De Havilland Canada.

Regarding the fleet's age, Widerøe's fleet is formed by quite old aircraft. The fleet is also quite heterogeneous as, although 41 of its 44 aircraft are DHC, the airline has three Embraer, which are the youngest in age.

Ranges

Just as in the case of the Feeder, Widerøe shows greater varieties in the ranges that its fleet can fly, meaning it does more diverse routes.

The Embraer is not just the newest in the fleet, but it also brings a big difference in terms of range, as it can reach more than double the distance than all other aircraft in the fleet.

In any case, ranges are much smaller in average than in the case of Volotea, with 2241km average.

Capacities

Capacities are also low with 54 passengers on average– they are able to carry less than half the passengers than Volotea does in one flight. However, again, the Embraer, can not only fly longer distances but also carry many more passengers, almost as many as a small airliner.

Widerøe's **fleet** is at the moment **heterogeneous** with **small regional aircraft**.

Chapter 5

Conclusion

5.1 Summary of Results

Table 5.1 collects the conclusions obtained from the analysis of the parameters defined in Section 3 for the selected airlines.

	(?) Volotea	**LCC Wizz Air**	**Hybrid C. Vueling**	**R. Feeder Air Nostrum**	**Bounded R. Widerøe**
Attended Destinations	Mid-sized airports	Big-sized airports	Big-sized airports	Mid- to big-sized airports	Small- to mid-sized airports
Attended Area	Continental	Continental	Continental	Regional	Regional
Network Topology	Point-to-Point	Point-to-Point	H&S	H&S	Point-to-Point
Attended Routes	Medium-haul	Medium-haul	Medium-haul	Short-haul	Short-haul
Frequencies	Low	Medium	Medium	High	High
Fleet Characteristics	Small airliners	Medium airliners	Medium airliners	Regional Turboprop	Regional Turboprop

Table 5.1: Summary of results

Out of the six parameters studied, there a three that have a result for Volotea that does not coincide with any of the other airlines: the attended destinations, the fleet and the frequency of Volotea. However, before jumping into conclusions, let's examine the outcomes for each parameter individually:

– **Attended Destinations:** Volotea is the only airline that flies strictly mid-sized airports (an 86% of its flights).

Others fly a variation of airports sizes – it is the case Vueling and Air Nostrum, with a particularly high percentage of passengers being flown to big airports. In the case of Wizz Air, it clearly flies 85% of its passengers in Spain to big-sized airports. Although there is no data from Widerøe, it is assumed that most of its passengers will be flown to small or mid-sized airports too.

– **Network Topology:** Volotea flies Point-to-Point. As do Wizz Air and Widerøe, while Vueling and Air Nostrum are considered to follow a H&S network.

  In these Point-to-Point systems, all destinations are very interconnected by their bases – there is not just one random destination from one of the bases to a particular destination. This would be, however, subject of further study.

  It is therefore important to acknowledge that Volotea does not have a unique hub, as do Air Nostrum and Vueling, as the computation of the Degree Centrality and the Hub-distribution network show.

– **Attended Area:** Volotea's network extends (potentially) throughout the European continent. Although right now it is mainly centered in the Mediterranean basin, it does shows signs of extending further North.

  This is also the case of Vueling and Wizz Air. Vueling actually covers a similar geography to Volotea, while Wizz Air is massively extended and concentrates its operations in Eastern Europe.

  Vueling is also especially centered in connecting Spain – mainly with neighbour countries and also to cities that are more far-off through Barcelona. This is very different from Volotea, who does not center its operations around a unique country.

  There is therefore no specific geography that Volotea covers that makes it different from other Business Models.

  Linked to the fact that it covers mid-sized cities, it is important to stand out that this target market does not restrain exclusively to a given region – as happens with Air Nostrum and Widerøe – but soughts to attend this specific niche (mid-cities / regions) in all markets/internationally (in terms of geography).

– **Attended Routes:** Both Volotea and Vueling fly medium-haul routes in average. Wizz Air flies medium-haul too but with a tendency to fly rather longer routes while Air Nostrum and Widerøe fly much shorter routes.

  Volotea and Vueling's coincidence here may be linked to the fact that they cover really similar geographies and markets. This parameter alone cannot be used to differentiate Volotea from a Hybrid as Vueling, although it is a clear differentiation from the Regionals and from LCCs, which, in general terms, fly different route lengths. This can also be

seen in the comparison of the longest and shortest flights (not just the average distances), which indicate other objectives when operating flights.

– **Fleet Charachteristics:** Volotea flies airliners as do the LCC and the Hybrid Carrier, which is a big difference to the Regionals, which fly turboprops.

  Wizz Air does not have A319 in its fleet but has many airliners of this family in bigger sizes. Vueling, on the other hand, also flies A319s, but does not exclusively use these – meaning, the airline aims at different-ranged and capacity routes. Carlos Muñoz stated that Volotea wanted to run exclusively on A319s.

  In general terms, this small airliner differentiates Volotea both from LCCs and Hybrids and the Regionals. Vueling may be using these to fly its longer but less-demanded routes, as it actually tends to mostly operate bigger markets; while it is an undesirable aircraft for Regionals as, although they transport less passengers, they do not require such long ranges. It may therefore be a key point in Volotea's plan to operate smaller markets, that require transporting less amount of passengers to a variety of ranges.

– **Frequencies:** This parameter also shows a clear difference in how Volotea operates: it flies really low frequencies. The low amount weekly flights stand out when compared to all other airlines and the closest it gets to is Wizz Air which, on average, flies 44% of its flights 1 to 2 times per week, while Volotea does so in the 66% of flights.

  Regarding daily number of flights, its distributions are closer to a LCC or Hybrid which mainly fly their routes just once per day; while it totally differs from the Bounded Regional, which flies mostly more than three times per day per route and the Feeder, which has a much more widespread distribution.

  This parameter can actually be directly linked with the fleet of choice. Volotea flies many routes at low frequencies and aims carry as many people as possible in one leg – all this taking into account that they fly mid-sized cities and that they may not be able to fill-up a bigger airliner. This also means that not that many aircraft are needed considering most routes are just flown once a week.

5.2 Can Volotea's business model be considered a new business model?

Given the previous conclusions, the answer to whether Volotea is following a new business model is **yes**.

With this answer, it is necessary to give this new business model a name. Current strategies

have their name based in different criteria: Legacy Carriers in reference to their length of service; others can also be named after the topology of their network – it is the case of the Network Carriers referrencing to their operation of H&S networks. Furthermore, when talking about Low-Costs, the reference is focused on its costs; and when it comes to Regionals, its name comes from the geographical area they cover in their operations. This difference in the origin of the names of current carriers makes it especially tricky to find out a name for a new business model.

It makes sense to make use of the scientific field, particularly the field of business models, to achieve the needed flexibility to overcome this issue. This area of study holds descriptions of current models and allows for the sourcing of publications and research papers in other sectors and industries. Therefore, this powerful tool can be used to look at other industries to find similar business models that describe the new model that the present thesis sougths to describe.

In the business model level, Volotea could be named as a Long Tail Model. The key to this model is found in the publishing sector:

"The long tail is a business strategy that allows companies to realize significant profits by selling low volumes of hard-to-find items to many customers, instead of only selling large volumes of a reduced number of popular items. The term was first coined in 2004 by Chris Anderson, who argued that products in low demand or with low sales volume can collectively make up market share that rivals or exceeds the relatively few current bestsellers and blockbusters but only if the store or distribution channel is large enough." [53]

Digital publishing has actually enabled the editing of fewer titles in a timely manner and selling on the internet has enabled publishers specialised in these titles to offer many titles so that the total amount of sales is enough.

This translates to the present case in the following way: Volotea is interested in looking for routes that, because of their lower traffic, are of less interest to airlines that follow different models. With smaller aircraft and lower frequencies, though, these routes can be flown. The business is sustained with a significant amount of routes to achieve economies of scope – which would be a coincidence with Regionals, but not regarding the area covered.

Therefore, Volotea would be following a **Long Tail business model in aviation**.

5.3 Prospects

By having limited this thesis to the parametrization of Volotea's business models, there are many subjects of study that remain open after its conclusion.

The present thesis could admit extensions, such as the identification of other airlines that could potentially also be following this business model in different geographies or even in the same one, which would lead to study if they could coexist in the same market in the same way there is competition between LCCs.

Volotea itself could also be the center of further study, and fill in gaps of the present one, to further describe the Long Tail business model in aviation. Some parameters that have been left aside are the belonging of the airlines to alliances, additional revenue sources, aircraft utilisation...

The parameters that where studied in this paper could also be looked into in more depth, such as the seasonality, the route operation of Volotea with other competitors and the minimum number of passengers the airline needs to keep a route open.

New research possibilities in this line could include a tool to verify whether the business model would work in a given market or to estimate the true potential of routes with low but enough foreseeable traffic. Questions as whether this business model will be sustainable in the long run, for instance, would be a question of time.

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