ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics

Master thesis

PERFORMANCE IN PRACTICE: LOW-COST AIRLINES

BUSINESS MODEL AND FIRM PERFORMANCE THROUGH THE PRISM OF LOW COST AIRLINES

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Thesis abstract

Low-cost carriers (LCC) feed the hunger for air travel demand and highlighting the possible ways of improving the concept can lead to a global improvement for the airline industry. This current work will indicate the differences and similarities of the LCC model by comparing its application in Europe and its origin – USA. To a certain extent, it is logical that there are differences in the application of a specific business model; but what these differences exactly consist of and moreover, can these differences explain different performance levels are crucial questions for proving if a strategical decision that is applied within one region can be utilized in a similarly successful and fulfilling way in another. Understanding the pivotal role of business models in the light of low-cost airlines is important as the development of the airlines industry and demand for air travel services grow immensely and are expected to continue growing in the future (IATA, 2006).

Key words: Performance; Business models; Strategy; Business model canvas; LCC business model; Low-cost airlines; Airline industry; Airline performance

Contents

I. Introduction

Business models and firm performance in the case of low-cost airlines

Within the last couple of decades, the term "business model" has been gaining popularity as it distinguishes from a business jargon to an essential part of the company's strategic management. Stähler (2001) and Osterwalder et al. (2005) present an interactive approach of defying the popularity of the term in the last 20 years. They have indicated the exponentially growing interest of business models as a topic in academic literature during the period of 1990-2004. Business models continue to be a popular topic in the academic literature nowadays as well. Using Google Scholar, a search engine launched in November 2004, which provides access to numerous academic works, books, and other relevant literature (Alphabet Inc., 2017), it is shown how popular business models have become as a case study since the time of Stähler's and Osterwald's research works. Figure 1 reveals the results of looking up on Google Scholar the complete term "business models" in titles of research literature for the period 1990-2016. It turns out that only in 2016, the term appears in the title of 1,070 research papers.

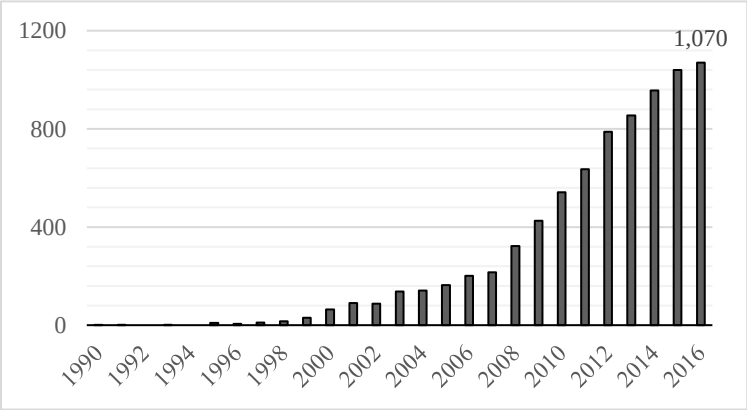

Figure 1 Occurrences of the term "Business model" in titles of academic works for the period 1990-2016

The raising popularity of business models is justified by the fundamentality of the business model concept to **firm performance** as it as it allows assessing specific business model specifics such as uniqueness, innovativeness, comprehensiveness and consistency within and across industries (Morris, et al., 2013). In other words, business models are a way of architecting internal resources by making strategical decisions with the prospect of reaching the desired results. These results can be measured in general via evaluating overall market performance and profitability indicators. Such performance indicators are most likely different between different industries.

However, market performance indicators can also vary within the same industries, but between regions. Such an example is the low-cost airlines business model - one of the cores of the airline industry. Together with full-service network carriers (FSNC), low-cost airlines set the frame of what the industry offers for tourism travel. The emergence of low-cost carriers in the United States in appears to have improved the quality, frequency and the cost performance of all actors

within the airline industry. However, low profitability or losses of many smaller low-cost carriers (LCC) "suggest that an effective airline strategy, rather than just the LCC business model by itself, is the key to success" (IATA, 2006).

Business models relate to activities that can be both useful and unifying (Zott & Amit, 2010). At the same time, however, low-cost airlines use different approaches when it comes to the value proposition which they offer. Across the world, low-cost carriers allow their customers to select products and services based on their needs. Along with the expected low fares, the low-cost airlines let travelers to choose if they would prefer extra luggage, comfort, leg space, food and beverages, and other conveniences, all for additional fees. On the other hand, these various options defibrate the stereotypical consideration that "the orientation of LCC decisions is…significantly different from that of the FSNC" (Tretheway, 2004) as LCC provide similar amount of services to their FSNC competitors.

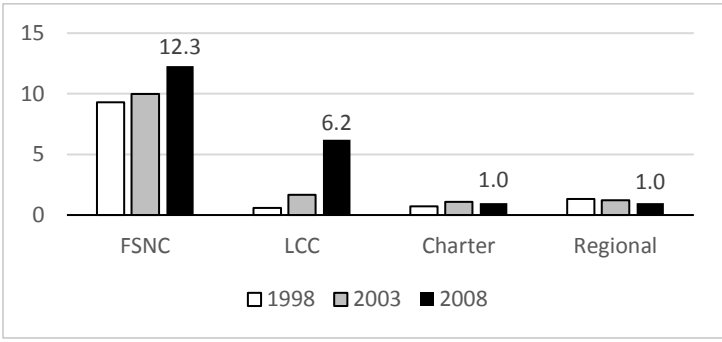

Figure 2 Produced capacity of FSNC, LCC, charter and regional airlines: number of available seats in millions (weekly) source: OAG

Customers' option to choose products and services in accordance to their wishes at generally lower fares, which low-cost airlines achieve to offer, undoubtedly impose a huge impact on not only FSNC, but the whole airlines industry. Figure 2 shows an evidence of the growth of the low-cost airlines services and indicates that the capacity which LCC produce has grown immensely since the 90s, in a similar fashion to the growing popularity of the "business model" term, shown in Figure 1.

Research goal

The rise of LCC is underlined by the application of specific strategical principles, fundamental to the low-cost airlines business model. Common airline industry key performance indicators (KPI) such as available seat kilometers (produced capacity), revenue passenger kilometers (number of paying passengers for flown kilometer), load factors, operating costs and profit, passenger traffic, fleet, on-time performance, are a useful measure for evaluating industry specific objectives which airlines achieve. However, do low-cost airlines across the globe achieve the same overall performance? Can the same business model concept lead to different market results in different geographic locations? Consequently, the main goal of this thesis is to determine, in terms of performance:

WHAT IS THE DIFFERENCE BETWEEN THE WAY THE LOW-COST BUSINESS MODEL IS OPERATIONALIZED IN EUROPE AND NORTH AMERICA?

Building up to distinguishing the main question of the thesis, several sub-questions will be answered:

1.1. What are business models and what are their components?
1.2. What are the main characteristics of the business model canvas?
1.3. How to evaluate firm performance in general?
2.1. What are the most common business models of the airline industry?
2.2. What are the characteristics of the low-cost airlines business model?
2.3. How to evaluate airlines performance?
3. What is the relationship of airlines key performance indicators and overall market performance indicators with the business model canvas?
4. What is the difference between the reported performance indicators by low-cost airlines on geographical level?

Research approach

The beginning of the thesis focuses on the main characteristics of business models and the business model canvas as a mapping tool of management decisions. Then, it is discussed how the results of the business model in terms of firm performance can be measured as a step towards determining if the same business model can lead to different outcomes.

Then, business models and firm performance are approached through the lenses of low-cost airline. In addition to overall market indicators, specific for the airline industry key performance indicators are introduced and described. As a result, firm performance indicators for low-cost airlines are related to the blocks of the business model canvas for identifying potential reasons for difference in the way the low-cost airlines business model is operationalized geographically.

To bring theoretical to practical manner, the research focuses on 10 low-cost airlines based on business-specific, geographic, stock exchange, and business relationship criteria. This research reveals data from the financial reports and publications of the selected set of airlines, whereas operational, financial and business performance information is reflected. Performing a two sample t-test statistical analysis will support in determine if there are and what are the differences in the way the low-cost airlines business model is applied in Europe and North America.

II. Business models

Abstract of the chapter

This chapter focuses on establishing what business models are and what they are not by exploring the origins of the term and its development in the recent years. The first part indicates the origins of business models as a subject of academic attention and its recent development. Next, a conducted literature review reveals various business models components and their relationship to one another as a step of designing a common business model structure. Then, the business model canvas is chosen as the most appropriate tool for assessing business model performance for the purposes of this study. Finally, this chapter concludes with description of several main market performance indicators.

1. Development of the term business model

The origins of the term can be dated all the way back to 1954, when Peter Drucker brings his five questions about management organization (Drucker, 1954). "Business model" was then first used as a phrase in a work by Bellman et al.; being described as a "decision process, which involves the use of human beings and machines" (1957). Today, this description engages only with the companies' key resources as a component of the business model concept. Later, Gardner Jones uses the term as part of a title of his work about education systems, which subject is not relevant to the topic of this thesis; nevertheless, business models are drawn as a "complex" that integrates "myriad functions and duties and activities" (Jones, 1960). The next (chronological) mention of the term is detected in Brennan's work about the administrative organization of the company and is obscurely framed as "management structure" which suggests "new administrative pattern" (Keenan, 1961).

The growing popularity of business models (see Figure 1) challenged many practitioners and academicians to compose the purest and most precise definition of the term. Some has tackled such task from a business and strategical perspective, others conceptualized on the technological orientation of the term, and third have described it through the prism of organization theory. Nevertheless, there seems to be more than one fitting definition for a business model, what it represents and how much power it carries for the overall success of any enterprise.

In 2011, Zott, Amit and Massa published a work that gathers a broad vision for the efforts invested in the theoretical development of business models. They indicated that 'business model' was included in 1,202 articles in academic journals and in over 8,000 nonacademic documents in the period 1975 - December 2009 (2011). Most importantly, they manage to draw

out the descriptions by which researches have indicated business models: "*statement*" (Stewart & Zhao, 2000), "*description*" (Applegate, 2000; Weill & Vitale, 2001), "*representation*" (Morris, Schindehutte, & Allen, 2005; Shafer, Smith,, & Linder, 2005), "*architecture*" (Timmers, 1998; Dubosson-Torbay, Osterwalder, & Pigneur, 2002), "*conceptual tool or model*" (George & Bock, 2011; Osterwalder, 2004; Osterwalder, Pigneur, & Tucci, 2005), "*structural template*" (Amit & Zott, 2001), "*method*" (Afuah & Tucci, 2001), "*framework*" (Afuah, 2004), "*pattern*" (Brousseau & Penard, 2006), "*set*" (Seelos & Mair, 2007) of business principles.

In continuation of the aforementioned study by Zott, Amit and Massa, this literature review aims to extend even further the vocabulary range of appropriate representations of the business model concept. One of the most cited and well-known metaphorical synonyms of the term is Magretta's definition of business models as a "*story* that explains how the enterprise works" (2011). Further comparisons set business models as "*manner*" (Teece, 2010), "*strategy tool*" (Casadesus-Masanell & Ricart, 2010), "*powerful idea*" (McGrath, 2010), "*perspective*" (Amit & Zott, 2012), "*incomplete approach*" (DaSilva & Trkman, 2014), "*a term of art"* (Lewis, 2014) "*sustainability"* and "*sufficiency"* driver (Bocken & Short, 2015).

From the reviewed literature, it appears that Amit & Zott are one of the most cited and advocated contributors for the definition of business models. They state that business models weigh the "content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities" (2001). In addition to this definition, business models can be generally explained as generic combination of value proposition, supply chain, customer interface and financial model (Boons & Lüdeke-Freund, 2013).

2. Comparison between "business model" and "strategy"

"Business model isn't the same thing as strategy" (Magretta, 2011)

Although strategical management is fundamentally different than business models as business models explain who your customers are and how to make money by providing them with value while strategy equals the way a company can beat its competitors (Magretta, 2011), it plays pivotal role in constructing a business model. Among many of the cited works in the previous part, it appears that researchers agree that strategy does not equal business model. Furthermore, it is concluded that strategies are not consisted of business models. However, the opposite is definite truth. Business models hold the ideas of the strategical management of the enterprise. These ideas bear the sought success of the company's future, development, current reputation and position on the market.

Strategies are created with the aim to use X and Y so to achieve Z, where:

- X and Y include all the resources within the company that are available and all the resources that need to be acquired or exploited externally;
- while Z is the competitive advantage that the management seeks.

If the company's key strategy is indeed to use X and Y to obtain Z, then a specific plan is a highly important requirement. And yet, going back to the metaphorical sound of the term, business models are the architecture plan that builds in a clear way the organizational process of reaching the desired outcome. If the strategy is the core, then the business plan is everything else for the strategical development of the company. Business models intermix the structures, entities, figures, numbers, and agendas in sufficient way for fulfilling the key strategy that will elevate the company to the coveted success.

Then, it may be established that strategy is indeed different than business models, but also part of the whole business model frame; even, the core of the business plan. Strategical decisions refer to the "contingent plan as to what business model to use" (Casadesus-Masanell & Ricart, 2010). By "contingent plan" it is meant the resistance that protects the company from being vulnerable to eventual market occurrences (Casadesus-Masanell & Ricart, 2010). In other words, business models only hold the conceptual main idea of the borne strategies, rather than the two being interchangeable terms. Hence, business models have much broader span of the company's future development. Looking through the prism of business models, using X and Y is not enough of what is needed to be done so to achieve Z. Rather business models provide information on what X and Y consist of. Such insight generates the Z (the value proposition[1]) that unlocks opportunities for the company to regain the craved success of the applied strategical decisions.

However, as Teece has already proven in his comparative analysis between business models and strategies, building up "a successful business model is insufficient in and of itself" (2010). Merging the company's key strategies and establishing a proper business model analysis is what the enterprise needs for reaching the desired level of competitive advantage (Teece, 2010).

3. Business model components

So, what are the components that are structuring a business model?

[1] Described later in this chapter, p. 16

As it was noted, various descriptions of the term business model have been given by many scholars. This inductively leads to the assumption that there are numerous perceptions on what the components of a business model are. Shafer, Smith and Linder reviewed publications from the period 1998-2002 to find out 12 different definitions for a business model and Table 1 reveals their findings, which identify 42 "unique" business model components or "elements".

Value network (suppliers)	Customer (target market)	Resources (assets)	Value proposition	Capabilities (competencies)	Processes (activities)
Revenue (pricing)	Competitors	Cost	Information flows	Output (offering)	Product and service flows
Strategy	Branding	Customer information	Customer relationship	Differentiation	Financial aspects
Mission	Profit	Business opportunities	Cash flows	Create value	Culture
Customer benefits	Customer interface	Economic logic	Environment	Firm identity	Firm reputation
Fulfillment and support	Functionalities	Implementation	Infrastructure: applications	Infrastructure: management	Management
Product innovation	Specific characteristics	Sustainability	Transaction content	Transaction governance	Transaction structure

Table 1: Components of a business model (Shafer, et al., 2005)

The table above, however, has several elements that are overlapping and hence, can be grouped in categories. Shafer et al. do so and establish 4 different groups of components via an affinity diagram: strategic choices, value network, create value and capture value (Shafer, et al., 2005).

- 'Strategic choices' consists of the value proposition that is offered, competitors and competencies of the company, revenue model, branding and differentiation, target market and mission, but also the strategy itself. It is important to note that this category includes all the components over which the enterprise have a flexible but consistent control. These are the elements that the company manages and are not only choices, but also organizational drivers.
- The 'value network' is an interconnected category which represents the suppliers, all the information and product flows and the information given to the consumers as well as customer relationship. These are the base on which the strategical choices depend. Furthermore, the company's behavior is solidly linked to the behavior of all of the two aforementioned groups - suppliers and customers. Hence, the value network is of a crucial importance for the success of the business model.

- The other two categories, ‘create value’ and ‘capture value’, both contain a few elements. However, these two groups rely and depend on each other. Create value exploits all assets in place so to navigate and operate the company’s current activities. In the meanwhile, capture value reflects the financial aspects and generated profit by analyzing the according cost structure of the required expenses.

Amit and Zott (2001), on the other hand, present a different approach, based on a conceptual and empirical research (Zott & Amit, 2010). They reveal the four most common themes that connect the activity system elements are **N**ovelty, Lock-**I**n, **C**omplementarities and **E**fficiency, or NICE (Zott & Amit, 2010). However, instead of addressing the exact components, they describe the environment in which the business model is created. This leads to the envisioned idea of their analysis about is the term business model consisting of and what ideas it beholds:

- Content or what processes and activities are present, and how the company operates;
- Structure or the network that links all the contents;
- Governance or the way the network is orchestrated.

McGrath (2010) narrows the components of a business model even further by stating there are only two core components. On one side is the “unit of business” or what the customers pay for and the second one is the processes and operational advantages that the company possesses and that influence its profitability (McGrath, 2010).

Similarly to the complexity regarding the definitions of a business model – there are many takes on what are the constituent components of a business model. Furthermore, it seems that one element can be split under several, or vice versa, several elements can be grouped in categories where they interact with, complement and complete one another. From business perspective, routing and linking the individual components is a manner of organizational and managerial approach; the company internally draws its own (external) paths in the surrounding business environment. The cruciality of such decisions is logically suggesting evaluation of all factors and possible scenarios of the outcome which follows from management’s strategical decisions.

4. Business model design

Business model design incorporates the idea of attentively and precisely intermixing the business model components in company’s path of reaching its goals for future development and sustainable existence. The internal configuration of business model elements relates to applying strategical decisions in respect to the desired results. In other words, designing a business model is putting strategy into practice. Combining the correct elements and applying the relationship

between every individual component in a coherent and efficient way beholds the idea about the sustainable nature of managerial and organizational company decisions.

From discussing and linking business model components, to designing and building the business model itself, is a challenge that requires a tool that grasps both the internal enterprise decisions, but also the external adaptability of the company. Organizational decisions build the architecture plan of the business model, but only if the decisions complement and improve the application of every element in this complex web of components. Leoncini and Montresor tackle the concept of complexity; they illustrate firms as complex systems in their book "Dynamic capabilities" where they hint at several sets of concepts referring to dealing with complexity: connectivity, signals, feedback, variety, predictability, and emergence (Leoncini & Montresor, 2008). Therefore, connecting the business model elements has to lead to the company's ability to detect external signals and solve problems before they occur.

As a result, merging business model components has to lead to simplifying the complexity of undertaken strategical decisions. Mixing corporate ideas and aims cannot lead to competitive advantage if the managerial and organizational choices are not coordinated with the company's abilities to perform efficiently while coping with market externalities. Therefore, business model design calls for a two-fold approach towards establishing the company's business model. On one side, the management needs to carefully evaluate what is the offered product, what is the customer segment, how can it be reached and what revenues it will stream. On the other hand, the company has to have a clear view of what resources, activities and partners it has available and how much capital investment such structure requires. The business model canvas fits both sides of such challenging task – it evaluates not only the internal but also the external business model aspects. The next part will reveal why the role of the business model canvas is pivotal and what makes it the most appropriate tool for not only exploring, understanding and controlling the business model design, but also for analyzing the results of operationalizing the selected business model.

5. Business model canvas

5.1. Origins

The business model canvas is work by Alexander Osterwalder (2008); since its presentation, it is among the most recognized tools for evaluating business models. It combines different elements and aspects of both the internal and external company organization so to provide clear understanding and analyzing of the current activities and processes that are taking place.

Furthermore, such an insight provides valuable opportunity for establishing points of improvement by detecting eventual flaws that would not have been clear to identify otherwise.

The canvas' existence follows from Osterwalder's PhD thesis work about the ontology of business models. It aims at contributing to the academic literature by updating the knowledge of the business model domain, defining the semantics and the relationships between the nine main elements of business models and presents the idea how business models can be used in the best possible way (Osterwalder, 2004).

5.2. Key characteristics

The business model canvas consists of nine interconnected blocks and defines in a clear and presentable way to both the stakeholders and the consumers of its product how the enterprise functions. The canvas is likely to provide a plausible overview of how the company operates (or the back stage) and how it delivers (the front stage). It can be even stated that it is a unique tool that shows how the strategies are developed and how opportunities are seized. Hence, the canvas is clear identifier of the difference between a business model and a strategy, as the latter is explained as both a consequence and driver at the same time of the former.

Most importantly, the business model canvas is applicable through a variety of business areas and that is what makes it valuable for the strategic management of any enterprise and in the business world as a whole. On the next page, Figure 3 shows an example of a business model canvas. Then, the nine blocks of the canvas are described and it is explained how they work with and complement one another.

The business model canvas helps discuss, map, design and build the business models by not just listing the nine elements that it consists of, but by mixing them in an efficient and approachable way with an ease of understanding. Let's accept as a given that the customer is always the starting point, then the canvas gives a clear overview of:

- Who is the customer and what are his characteristics? (1)
- Why is the offered product able to fulfil the consumer's needs? (2)
- Where is the product and is it reachable by the customer? (3)
- Will the product be able to engage the customer with the company? (4)
- What is the monetary value of the product and is it reflecting a revenue stream back to the company? (5)
- Which resources within the enterprise are used or need to be obtained so to support the offering of your product? (6)

- Does the company perform the activities necessary to excel the enterprise operations? (7)
- How the company connect with key partners that will help for achieving the desired goals? (8)
- Is the cost structure allowing to turn the answers of the above questions into reality? (9)

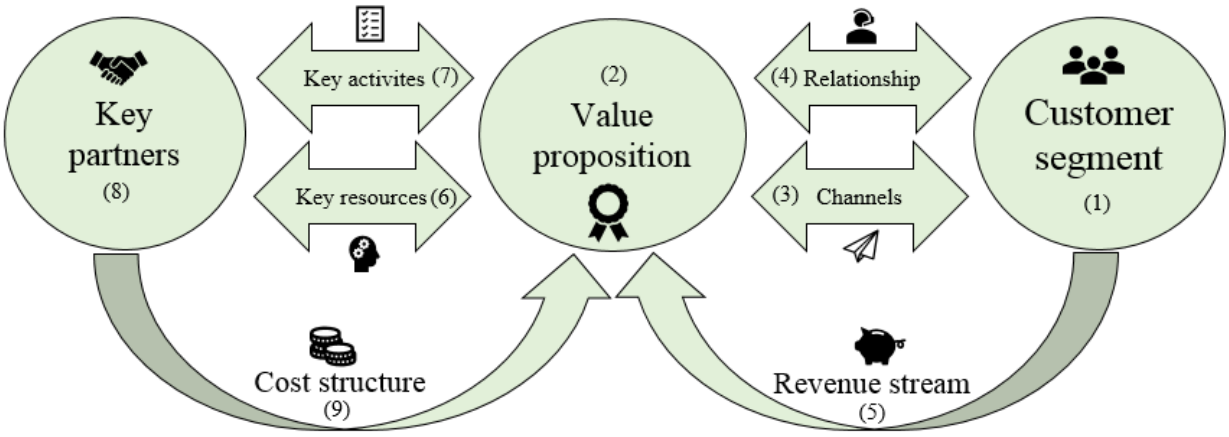

Figure 3 Business model canvas and its nine interconnected elements

1. The ***customer segment*** is of a primary importance to be detected and framed in an accurate way at a proper time. By an accurate way, it is meant that the customer segment needs to be analyzed carefully – demographic statistics, geographic location, interests, popular trends and social needs. Further but not less important points of analysis are why would exactly the specified group of people be interested in paying for the offered product and what advantage does the product have compared to similar competitors' products. It is most likely that the customer segment is defined by more than just one or a few categorizations – gender, age, profession, income, lifestyle, etc. Only after understanding who the customers are, the value of the offered product will be completely unlocked and utilized for the consumer's needs.
2. The ***value proposition*** is not only the product that is offered to the customer segment that is of interest for the company. It is also not just a characteristic overview of the idea that the strategical management of the company established. The value proposition responds to customers by solving one or some of their problems or fulfilling their needs. It is not about how the company functions, what are the resources used, where is the the product created and offered. The value proposition aims to satisfy the consumer's wish. Value itself means "the regard that something is held to deserve; the importance, worth, or usefulness of something" (Oxford University). And proposition is the expression or the opinion given in a response to some statement. So then, if the statement is the

consumers need, then the value proposition is this part of the business model that concludes the customer's desire.

3. To get the value proposition to the customer segment, the company shall consider the appropriate ***channels*** for delivering its product. Channel is not just the road, or the track, or the route that is taken from A to B. Nowadays, the channel can also take a virtual form. The physical distribution is not necessarily a must anymore. An airline company for example needs an aircraft so to transport the passengers on the air route, but this is not what the channel refers to. Rather, the aircraft is a key resource. But the way the service is brought to the customer – either virtually by booking tickets online or physically by being printed at a tourist agency represents the way the product is delivered (channeled). In the first case, it is distributed via an online web base that is accessible directly by the consumer, while in the other case – it is delivered to the agency as part of a deal between the company and the "issuer" of the ticket.
4. Combining the above three elements, logically follows the establishment of the fourth piece of the canvas – the ***customer relationship***. Acquiring the customer segment that is of a main interest is just the start of delivering the value proposition (via a channel) to the customer segment. However, the re-occurrence of this chain of events is what is of a necessity for the company so to successfully incur a continuance improvement, growth and satisfaction for its customer base. If the customer segment changes, then everything else in the string needs to be re-adjusted. Hence, once established, the segment needs to be maintained in order to grow while keeping it as a primary interest.
5. What matters in every business is cash. Once the above steps are followed, the completion of the customers' side in the business model canvas (points 1-5) will be in tact only if it is all worth it. When the customers pay for the offered product, the generated ***revenue stream*** does not equal the profitable characteristic of the value proposition. It is rather what is gained and to a certain extent sets the expenditure horizons of the company by managing its spending behavior. Nonetheless, a pricing model is not enough to describe the revenue stream; the revenue stream should be according to the value that the company defined in the proposition that it offers. Value does not equal numbers, but the value of the product is what the customer pays for, what the company invests in and what should define the total of revenue streams that flow in the enterprise.
6. From this point on (points 6-9), the business model canvas shifts focus on the internal organization of the company. First, there are the ***key resources*** that the enterprise exploits in order to locate the customer segment (1), offer it the value of its products (2)

via the established channels (3) and maintain its relationship (4) to the customers so to generate cash (5). Key resources are assets in place, human capital, and behavior of the company, its financial health and stability. In general, they are these elements that are generating all processes and activities and offer resistance to unexpected situations so to minimize the market vulnerability of the company. Important node here plays the ability of the enterprise to restrain the resources of disappearing from the company. From their financial understanding – for instance, maintaining the necessary liquidity, to the physical aspect of the key resources – for example, the proper usage of machinery and technology, from controlling their intellectual property and field knowledge to protecting the human capital of being drawn to competitors or demotivating it to perform at the desired level, the key resources shape a wide category that needs to be thoroughly understood and guarded by the management of the enterprise.

7. Closely related to the key resources are the ***key activities*** within the company. An activity would indicate the process that is going within the company and that generates, by utilizing the key resources, the value proposition. The key activities are the whats, the hows and the whos of the internal organization. What process is required or what action needs to be taken at a specific time; how to use every resource in the most efficient way possible and how to allocate the resources so to form a functional but not a conflictual situation; who should take over which aspect of the key activities that are held within the company's internal performance. Hence, this element plays vital role of the problem-solving process when creating the value proposition.
8. During the discussion about the difference between business models and strategies, it was already highlighted that some key resources may not be present internally and can be attained externally. Missing a resource would most likely result in not having the ability of performing an activity the way it should be performed. ***Key partners*** can serve the organization of the company in providing it with the missing puzzle pieces that are required for completing the jigsaw, in the face of the value proposition. Key partnership may also be in the form of connecting companies that are distinct geographically as this would allow them to serve a wider spread of business areas. Some companies relate to direct competitors to form alliances in serving narrowly connected markets mutually. Others are forming joint ventures that operate as one whole unit so to maximize the utilization of the resources that are available in aim of excelling the key activities that are performed; hence, forming the value proposition in the best and most efficient way possible. Nevertheless, key partners can unlock hidden opportunities for the current and future stability and development of the enterprise in the way it is known.

9. Conclusively, there are the expenses that are generated for the functioning of the company. The ***cost structure*** of the business model shall not exceed the revenue streams that are flowing in the company. This element of the canvas does not relate only to the key partners, or the exploitation of the key resources or the operating costs of the key activities. The cost structure answers the question how does the complete business model function. More importantly, it gives a clear overview of what is spent for what, where enhancements can be made, what savings can be implied, when this can happen and how it may happen. This ninth component of the business model canvas is likely to represent answers to typical financial questions such as what are the fixed and variable costs, to what extent are economies of scale possible, are there more optimal possibilities for the internal organization of the company and how can it be achieved.

5.3. Advantages and criticism of the business model canvas

The business model canvas is a tool which provides an explicit and understandable description of how business models work. It answers questions such as what value does the selected business model capture, who benefits from it, how is this accomplished, how is this maintained, what is the value of the business model, what actions stay behind its creation and what leads to value creation, at what cost were the strategical aims achieved and how does it pay out. The canvas, as a tool describing the business model of a company, provides an overview through inside-out and outside-in approaches (Baden-Fuller, 1995; Simanis & Hart, 2009; Chesbrough & Garman, 2009; Joyce & Paquin, 2016). Therefore, the business model canvas appears as a tool which can be flexibly applied across different businesses.

However, the nine interconnected blocks need to be analysed together, as one whole, rather than as independent elements that are just linked one to another. Controlling several out of the nine elements does not guarantee the success of the key strategy that is the core of the selected business model. Moreover, even controlling all nine elements would not be enough for accomplishing the company's goals as the business model canvas do not focus explicitely on the matters such as company's mission and strategic objectives (Fauvel & Ching, 2013). Consequently, the business model canvas does not grasp on competition with other business actors.

Nevertheless, the business model canvas is of a great use for the business world in identifying the advantages and disadvantages of the company's organisational and strategical behavior on its path to achieving the desired goals and level of success and regaining competitive advantage. As a result, interconnecting, and completing, and working with one another, the nine building

blocks of the business model canvas can be seen as a blend that perceives how the company can create, deliver and capture value.

The conceptual core of the business model canvas – its nine blocks, summarize the 9 most important elements for successful businesses. Connecting them in a efficient organisational web is the next important step after establishing the company's goals. It can be concluded that business models are summarized as "the totality of how a company:

- selects its customers;
- defines and differentiates its offerings;
- defines the tasks it will perform itself and those it will outsource;
- configures its resources;
- goes to market;
- creates utility for customers;
- captures profit" (Slywotzky, 1995);
- and creates value.

The outcome of the applied strategical decisions and business model specifications is logically the next crucial point of analysis. Across different industries, business model frames are difficult to be uniformly evaluated because of the characteristics that are inherent to the business environment in which the company operates.

Thus, measuring performance is a necessety for the strategical development and contuing improvement of the company. Performance is a relative measure; nonetheless, there are overall market indicators which allow to measure performance in general and among various economic fields in a relatively simple, yet reliable ways.

6. Firm performance

It is empirically proven that the rate and the precision of decision making is strongly linked to firm performance; hence its market growth is a derivative of the company's management control and organizational missions (Baum & Wally, 2003).

Performance is a difficult to generalise measure. It is a complex mix of numerous factors, incliding strategical decisions, market presence, managerial adequateness. The ambitiousness of exploring performance-related differences between companies requires uniform approach in selecting comparative criteria.

There are several fundamental ratios which stand out among all other performance indicators as they are commonly applied among different industries. Some of them will be reviewed in the next paragraphs.

6.1. Enterprise value

Enterprise value as a combination of several important for any business financial measures, but most importantly – debt financing and market capitalization.

$$\textit{Enterprise Value} \begin{cases} + \textit{Market Capitalisation} \\ - \textit{Cash and Equivalents} \\ + \textit{Preferred Equity} \\ + \textit{Minority Interest} \\ + \textit{Total Debt} \end{cases}$$

Equation 1: Enterprise Value (source: Bloomberg)

Debt financing and its relationship to firm performance is a vital issue for any company's management (Yazdanfar & Öhman, 2015). Debt is a financial instrument which companies may use as a trade-off between gains and costs as long as the related expenses are not in excess of the benefits of tax-shields. But does this affect immediately the company's performance? From investments and profitability perspectives, this is most likely true. If debt is intentionally used, such a resource is utilized in respect of broadening the resources of the company and expanding its capabilities. However, this is a static and unrealistic assumption, which may further be impacted if it is considered that debt levels may be boosted unconditionally. Therefore, as a tool that needs to be used carefully, debt financing can influence to a certain extent the company's business performance.

On the other hand, share prices (hence, market capitalization) is another indicator for the company's reputation and market performance – not only on the stock exchange, but also within the industry where it operates. The market price per share of a publically traded company reflects the overall investors' interest towards acquiring share of a company at a selected moment in time. Share prices also partially account for various external economic factors. External events in the surrounding business environment may impact significantly any related businesses and industries. A raise or drop of the market price of a certain firm may trigger as indicator either of this company's current performance or events in its respective economic sector.

However, neither share prices, nor debt financing can specify statements related to the actual firm performance, nor they can be meaningfully used for comparing one company with another. It is meaningless to solely weigh company A's share price against company B's share price or

in this manner, levels of debt financing. Therefore, enterprise value can be used as a statistical figure: indicating which company achieves more in terms of capturing value and market share[2]. On this note, enterprise value can be applied for ranking companies among the same industry[3].

Next, the market indicators in the next paragraphs (from 6.2. to 6.7.) can be broadly applied for comparative purpose, regardless of industry specifications.

6.2. Profit and net profit margin

The most essential goal of any business is to earn surplus (profit) over its operational expenses. Profit, however is a value which can widely vary in respect to company's market share, operations, activities, and geo-political environment. Therefore, it is hard to determine if one company performs better than another based on a figure such as profit. For example, let's consider a worldwide enterprise which achieves much higher profit than a local corporation, it would be misleading stating that the first performs better, overall, than the latter.

However, net profit margin is a precise financial performance indicator which translates the relationship between net profit and generated revenue

$$Net\ profit\ margin\ = \frac{Net\ profit}{Total\ revenue}$$

Equation 2: Net profit margin (source: Bloomberg)

Net profit margin evaluates the financial health of the company. It clearly identifies how profitable is the value proposition of the company. Furthermore, it allows to compare companies regardless of size, scope of operations, market share, and can be used both as a comparative benchmark between companies among different industries but taking under consideration these industries' specificities.

6.3. EBITDA margin

EBITDA is a very important market indicator as it excludes the interest paid, tax, depreciation and amortisation; such composition allows evluating the operational profitability among companies. It is also a helpful metric for performing cost-cutting measures. Further, this can be translated into acquiring essential informaiton of better understanding and applying business-specific decisions. However, EBITDA is simialar to profit in the sense of being used as comparative benchmark. It needs to be kept in mind, however, that EBITDA can be largely

[2] This is also the only purpose of using enterprise value later on in the comparative analysis of low-cost airlines.
[3] In the comparative part of this thesis, EV will be used with such purpose – for ranking low-cost carriers in terms of EV as they are actors in the same business field

different between different sized companies, and as such it won't be a meaningful indicator for comparing their performance.

EBITDA margin, however, unlocks the opportunity to evaluate firms' operating profitability and cash flows.

$$EBITDA\ margin\ = \frac{EBITDA}{Total\ revenue}$$ Equation 3: EBITDA margin (source: Bloomberg)

Such ratio, similarly to net profit margin, can be also used as a comparative benchmark between companies of different size and market scope. It presents any current and future investors of clear understanding for their investments, whilst diregarding industry specifications.

6.4. Operating margin

Operating margin is in theory similar ratio to net profit margin and EBITDA margin. Operating margin is a particularly industry specific. In other words, it can be appropriately applied when comparing companies that apply the same business model. This can be proved to a certain extent by reviewing operating margins of companies among different industries: they have widely contrasting operaitng margins and comparing them would be menaingless.

$$Operating\ margin\ = \frac{EBIT}{Total\ revenue}$$ Equation 4: Operating margin (source: Bloomberg)

6.5. Return on investments

$$ROI\ = \frac{Net\ investment\ result}{Cost\ of\ the\ investment}$$ Equation 5: Return of investments (source: Bloomberg)

ROI is commonly used because of the specifity it carries and the simplicity of its meaning. Clearly, if ROI is negative figure, then the investment is much more expensive than what is gained from the invested capital. Further, the higher ROI is, the more attractive it is for current and future investors as it carries value and opportunity of earning higher income.

6.6. Return on equity

$$ROE\ = \frac{Net\ income}{Shareholder's\ equity}$$ Equation 6: Return on equity (source: Bloomberg)

ROE is a measurement on how well the company's management uses investor's money. In other words, it shows how much did the company generate in earning via utilizing investors' capital. Therefore, the main difference between ROI and ROE is that ROE shows how much did the investors earner for their investment in the company, whilst ROI takes into account overall investment in the company, including all assets and loans.

6.7. Return on assets

$$ROA = \frac{Net\ income}{Total\ current\ assets\ value}$$

Equation 7: Return on equity (source: Bloomberg)

ROA shows how profitable is a company in regards to investment in its assets. As such, this ratio is widely dependable on the industry specifications.

Airlines and maritime operators, for example, invest huge amounts for acquiring their current assets; it will be unrealistic to compare ROA of transport operators to, for example, fin-techs.

Therefore, these 6 ratios together with EV can all be considered essential overall market indicators for the current research as they provide additional evidence in determining if there is a difference between the way LCC operationalize their business models in different geographic regions.

***

Furthermore, all of the overall market performance indicators described above can be linked to selected blocks of the business model canvas as a step towards linking it to firm performance.

- Enterprise value is a measure for the market value of the company. Then, EV, in this sense, can't be linked to a specific block of the business model canvas; it rather reflets the ***overall orchestration of the complete business model***;
- EBITDA and net profit margins are both result of the ***revenue streams*** and ***cost structure*** of the company's business model. Furher, they can be considered as consequent result of the value proposition as it plays the engine for the utilization of the company's business model;
- While ROE is connected to both the investors funding and the generated revenue streams, ROI and ROA are closely related to the operational capabilities and generated profitability of the company; hence, they are all representing efficiency and therefore, are closely related to the ***left side of the business model canvas***.

Conclusively, performance measurement is most clearly definable when evaluated within a specific industry, and especially in business fields where actors are fairly interchangeable and hence, the competitive levels are high. This is exactly the case with the airline industry; the two main business models – FNSC and LCC are becoming more and more similar in their approach to customers and the way they capture market share (Lohmann & Koo, 2013).

III. Low-cost airlines

Abstract of the chapter

This chapter focuses on the low-cost airlines as an essential core of the airline industry. First, the origins of the LCC concept are traced. Then, the focus falls on the main strategical principles which are inherent to this business model. This leads to a generic LCC business model canvas as a result of merging all strategical principles in one complete frame. This part concludes with describing how is performance measured among commercial airlines, approached by through prism of low-cost carriers. Finally the performance measures are related to the entirety of the business model canvas.

1. Business models in the global airline industry

The airline industry is one of the technological and economical drivers for the development of the transportation world. It comprehends for improving the quality of both tourism and trade by connecting people, countries and cultures. Furthermore, the airlines industry does not differentiate between developed and developing regions but rather links them in a vast network that never stops expanding.

Air transport is one of the most important transportation modes nowadays and its importance is growing in accordance with the increase of air passengers every year, raising to 973 mln passengers only in Europe in 2016, 5.3% higher than 2015 (EuroStat, 2017). As already shown in Figure 2 (p. 7), LCC contribution to the raise of air travel in Europe highlights the importance and value of the low-cost airlines business model in the transport economics and its development.

For the last several decades, the airline industry has been transforming rapidly due to regulation changes, mergers and acquisitions, and formation of airlines alliances. Business activities of such kind expand the range of business models within the airline industry. The European commission recognizes a split of airlines business models into full-service network carriers (FSNC), low-cost carriers (LCC), holiday carriers, regional carriers, traditional freight carriers, integrators and hybrid carriers (Deutsches Zentrum für Luft- und Raumfahrt e.V., 2008). Every of these business models has its own specifications, which make them distinguishable from one another. Nevertheless, the report of DZLR concludes that business models within the airline industry are becoming less and less distinguishable, which leads to an innovative and interactive business decisions. Nevertheless, FSNC and LCC are clearly the most recognizable business model examples of the airlines industry. Since the emergence of LCC, they are providing

increasing capacity and successfully regain market share by leveraging their cost efficiency and innovation for the benefit of the entirety of the airlines industry.

2. Origins and development of the low-cost airlines business model

LCCs are generally an alternative provider of air services to the FSNCs. Low-cost airlines offer much simpler product by conducting simpler operations in comparison to legacy and national carriers.

1978 marks the year of a global change for the airline industry as US President Jimmy Carter signed the Airline Deregulation Act[4]. This act was seen as both an opportunity to tackle inflation and provide less expensive air transportation within the borders of the United States of America (Peters & Woolley, 1978). In an environment of regulated airfares, airlines were stuck into their business model of providing increasing, as number, services; if one airline does not grasp on the opportunity to provide an extra service, then another airline will do it as long as the marginal cost does not exceed the revenue generated under the applied price floor (basic economic principle). Furthermore, before 1978, the Civil Aeronautics Board (CAB) would dictate the rules of the air travel market. CAB had the ultimate authority power to decide on which airline can provide what services within a specific geographical range (Unnikirshnan, 2015). The most well-known example is Southwest Airlines, which provided only intrastate services within the state of Texas (Southwest Airlines, 2017).

The signing of the Deregulation Act meant liberalization of the air transportation as companies would have the opportunity to compete not only on service but also based on fares. Such a change makes it easier for new entrants to come up with new business models, different than the one that was implemented by the incumbents. The change, however, was not sudden. It took a while, for example, for Southwest Airlines to reach to the level of network carriers. First, the company expanded its operations outside of the Texas borders and focused on a broader south-west and west coast markets. It was only in the 90s when it reached a national level (Southwest Airlines, 2017). During that time, many other low-cost airlines launched operations but none has survived later than 2011[5].

Meanwhile, in Europe, the low-cost airlines concept depends mainly on liberalization of the air travel between European countries. The first and main step towards "free" and less heavily regulated European air transportation market was the "Third package" of air transport

[4] The largest accolade of this event is the removal of the "price-floor" for US airliners
[5] The last low-cost airline launched in the 90s, AirTran, 1993, was acquired by Southwest Airlines (Southwest Airlines, 2011)

liberalization measures (European Commission, 1996). Similarly to the Deregulation Act, the effects of this change were not sudden either. The "Third package" had a slight impact on the European air travel as number of routes increased by a small margin, from 490 to 520, but it also re-shaped the monopolistic strategies and excessive fares which companies would usually charge (European Commission, 1996). The most well-known example of a European low-cost airline to gain within this period of time is Ryanair, launching operations in 1992 and grasping on the opportunity to benefit immensely; mainly because of its first-mover advantage compared to other companies, which could not survive at that time (Ryanair, 2016).

The success and the leading paradigm behind the low-cost business model is founded on two main ideas. First, the product should be as simple as possible. There is no need of connections, hubs, various obligatory rules, regulations, in-flight services, fleet variety and dissimilarity. Next, the low-cost business model aims to not only satisfy demand but increase it. This is achieved by attracting new customers in new areas (distant airports from big metropolitans) via significantly lowering fares (Doganis, 2010).

Low-cost carriers strive immense success and their businesses grow with somewhat exponential rate (IATA, 2006). International Civil Aviation Organization (ICAO) reports that only in 2015 over 3.5 billion passengers used air transport services of which about 984 million (or approximately 28%) used the services of a low-cost carrier (ICAO, 2016). As per the same report of ICAO, low-cost airlines saw an increase in passengers of 10% just for 2015 in comparison to 2014. Clearly, LCCs are able to maintain such records because of their ability to create and maintain sustainable competitive advantage. As per Porter, competitive advantage can be gained by following either of two (effective) strategies – differentiation or low cost (Porter, 1985). In the case of the airline industry, both FSNCs and LCCs possess competitive advantage in certain geographic markets by providing a specific value proposition. Porter's generic strategies framework (Figure 4) suggests that with the differentiation strategy, companies offer distinctively different product that the customers value appropriately, both fare-wise and differentiation-wise. This is the case of FSNCs – they offer many extra services already included in the final price in addition to the flight service itself – beverages, food, luggage or else. From variety perspective, all these add up to a superior product quality compared to their LCC competitors.

The low-cost strategy holds the objective of a company aiming to be the lowest-cost operator. Hence, in the case of low-cost airlines, operators aim at providing their products at the lowest

possible cost[6]. The beneficial behavior of low-cost carriers springs from the nature of the service provided – flight service on a more affordable fare compared to flight service that includes extra (not necessarily needed) services, which increase the final price and cost of delivery.

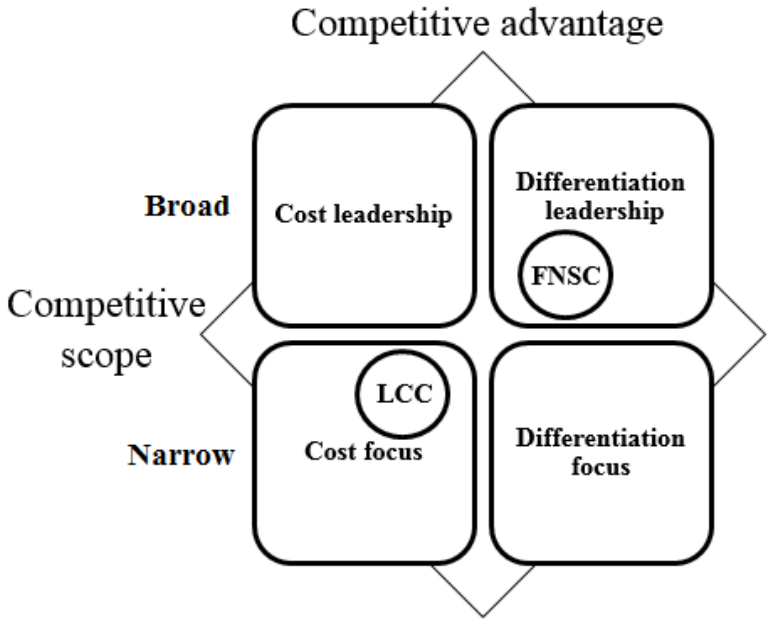

Figure 4 Placement of the LCC and FNSC in Porter's generic strategies framework

In the figure above, the placement of the bubbles is near the center. This flows from the fact that nowadays, there seems to be less distinctive difference between the business strategical market approach between FNSCs and LCCs and the ways they offer their value proposition. FNSCs try to reduce their cost as much as possible so to retain their competitive levels (Kumar, 2006). LCCs, on the other hand, continue innovating and designing a tighter customer relationship in unique ways, which are following the rules of the low-cost business strategy[7]. These rules are defined by a range of inherent principles, bounded to the idea of the low-cost airlines business model.

3. Strategical principles of the low-cost airlines concept

In this part all the elements of the business model canvas that were described in chapter II (p. 16) will be refurbished through the prism of the low-cost airlines concept. Ultimately, the goal of this part will be to build the generic business model canvas for low-cost airlines. The statements and the related withdrawn conclusions in this part are based on qualitative research and quoted authors from the former parts, unless further specified.

[6] Important note here is that sometimes companies operating at the lowest cost, may not provide significantly cheaper product. Fares depend on the levels of productivity, business scale, efficiency, resource utilization and other. Hence, it is notable to make difference between low-cost and low fare (price).

[7] For example, WizzAir offers a membership program (WizzAir, 2017), which is inherent for FSNCs.

3.1. Introduction

As it was already established, and is wide-known, the main strategy of low-cost carriers is to operate at the lowest cost. This strategy is based on many principles that are usually met by low-cost airlines, world-wide. The following analysis will reveal the main strategic ideas of the LCC operations via relating them to every block of the business model canvas.

3.2. Customer segment

The customer segment which is of interest for any airline can be generally defined as leisure and business travelers using air travel services. In the global airline industry business travelers can be further subsegmented in regards to the purpose of travel (intra or external company meetings, conferences, exhibitions, trainings, incentive packages) and leisure travel can be split in two main groups – travelers visiting friends and family and travelers on holiday/vacation (Holloway, 2008). However, in the case of low-cost carriers, the customer segment is much more specific. The target group of the product can be further specified and not just categorized as leisure or business travelers. They can be distinguished as price-cautious and price-conscious flyers, who prefer to pay for a satisfactory service rather than over-serviced and hence, more expensive flight. Such a detailed view, however, cuts a lot from the generalization of leisure and business travelers. There are these business travelers that are engaged with specific airliner as the company they work for may have a better relationship with a travel agent or even a representative company of a FNSC. Furthermore, not all leisure passengers would travel with a low-cost airline as some would prefer the treats and amenities that a FNSC provides. A free of charge newspaper or a cup of fresh coffee or tea may be enough for a business or leisure traveler to push them paying a bit more, but flying at higher convenience between airports that are located more suitably and near big cities. So then, the customer segment of a low-cost airliner should be defined as a price-sensitive tourists and business travelers who are willing to pay more only for the services they need in addition to their flight (or none if they need nothing but the flight itself).

Coming out from the fact that most important decision factor for a traveler is the price paid for the desired service, low-cost airlines tend to offer different (lower) prices than their FNSC competitors. However, in most (even if not all) cases the prices are much less expensive. For example, let's look up the prices of a flight service from Amsterdam to London and back from London to Amsterdam[8]. Using a low-cost carrier, like easyJet, allows a passenger to fly from

[8] Date of looking-up prices: 20-July-2017; period of travel 27-Sep-2017 – 01-Oct-2017; chosen airlines' websites: easyJet: www.easyjet.com and KLM: www.klm.com

Schiphol International to four different airports in London – Gatwick, Stansted, Southend and Luton. Meanwhile, KLM offers a regular service between Schiphol and 2 other London airports – Heathrow (KLM flight) and London City Airport (KLM Cityhopper flight). Further, the difference between travel services from Amsterdam to London is not only in the airport that will be used. The fare, which a customer needs to pay is substantially different. While KLM would charge at least €119.00, easyJet's flight will cost only €55.00 for the round trip; more than 50% difference. However, the KLM service will bring the traveler to an airport closer to the city of London. Such convenience needs to be correctly estimated by a traveler so to decide if it is worth it such a price difference and what would be the additional cost from departure point to departure airport and from arrival airport to final destination point.

Hence, the customer segment of LCC can be specified as:

- ★ ***Price-sensitive travelers***
- ★ ***Travelers willing to pay only for the service(s) and convenience(s) they need***

3.3. Value proposition

The value proposition can be inappropriately generalized by being referred to just as seat in a flight from point A to point B. The management of low-cost carriers must be aware of much more than just providing the flight itself.

First and foremost, as already noted in the previous part, it should be at a low fare. This is the main attractive characteristic of the LCC product and customers expect low-cost to match their perception for low prices.

Next to the low fares, the LCC needs to be able to predict what other amenities it needs to offer in accordance to the customers' needs and their willingness to pay. When booking a flight, low-cost airlines provide options for extra luggage, on-time guarantee, transportation from the airport to the final destination, travel insurance, all at appropriate price so the customer can book these extra amenities through the airliner rather than through in-direct competitors who offer such additional services included in the final price (e.g. FSNCs).

In addition, LCCs need to be ready for providing food, beverages, and even duty-free products on board so to maintain the satisfaction levels of customers who are ready to pay for such convenience treats. Inside the aircraft, LCCs usually offer less services, which are included in the final fare paid by the traveler for the flight service. For example, complementary beverages, snacks, branded airline magazine, seat adjustment or more comfortable seat, or even a seat

pocket where travelers can place their belongings, are all unnecessary luxuries which low-cost airlines would rather avoid investing in and maintaining afterwards (Doganis, 2010).

Moreover, LCC can afford extra amenities like on-time arrival guarantees and luggage insurance with a reasonable amount of certainty. To prove this statement, let's consider that low-cost airlines' flights are not connecting and small airports are mainly used; then, the value proposition of the low-cost airlines includes:

- On-time guarantee: due to lighter air traffic the flight is less likely to be delayed;
- Luggage: assuming that at a smaller airport and a non-connecting flight, the chance of lost luggage is negligibly low;
- Commuting to final destination: as travelers may need transportation from the smaller size airport to their final destination.

Therefore, the value proposition of low-cost airlines includes not just the air travel service, but also extra convenience, expectation for on-time arrival, and overall convenience of the journey:

- ★ ***Air travel service***
- ★ ***Food and beverage on board and other in-flight amenities***
- ★ ***On-time arrival guarantees***
- ★ ***Travel insurance***
- ★ ***Car rental, shuttle service, accommodation***

3.4. Channels

The customer channels are the bridge between the customer segment and the value proposition. They play vital role for any business and industry.

In the case of low-cost airlines, the channels are very important node in their business operations. Most of the LCCs around the world are not IATA members (IATA, 2017). As IATA membership provides opportunities of sale of tickets of various airlines at one spot (e.g. website, travel agency office, airport desk) or participation in airline conferences and exhibitions (IATA, 2017), this very well explains why low-cost airlines are rarely part of big websites which compare fares between airlines. As a result, travel agents would rarely be considered as channels of low-cost airline services. It may be rather pointless and unprofitable for any travel agent to sell tickets of LCC on the price or higher of what the LCC actually offers through their own

platform directly to the customer. Rarely, a low-cost airliner would provide a call assistance or if they do, the company may excessively charge for such a phone service[9].

Therefore, LCCs maintain their own channels (website, mobile application, hotlines) where passengers can look up a specific flight route that they have experienced or know about its existence. Hence, such a platform needs to be well-known or advertised through social networks or advertising tools so to reach to the desired customer segments. Thus, in addition to the online platform that the company has established, other channels would include promotion stands and rolling ads over key regions or areas which are new for this type of product or where the company is still not much familiar to potential travelers. The most notable difference in comparison the any other airline business model is that low-cost airlines are targeting their customers directly (Buck & Lei, 2003).

As a result, the channels which a low-cost airline builds and maintains include:

- ★ ***Direct contact with the traveler***
- ★ ***Websites and mobile applications***
- ★ ***Hotlines***
- ★ ***Email, online and radio and television advertisement***

3.5. Customer relationship

The most common and well-known airline tool for maintaining relationship with travelers are the frequent flyers programs; by attracting passengers in subscribing for such memberships, airlines solidify relationship with their customers in return of passengers earning miles, having guaranteed seats or luggage conveniences, priority seating and airport check-in (SkyTeam Inc., 2017).

In the early years of the emergence of the low-cost airlines business model, LCCs were rarely connected to possibilities of providing a membership subscription to a loyalty program managed by a low-cost airline. However, this considerably changed in the last 2 decades; low-cost airlines started breaking the status quo that frequent flyer programs are exclusively part of the FNSC product and demonstrate different types of subscriptions to attract and maintain loyal travelers (Tomová & Ramajová, 2014). For example, WizzAir offers a discount membership which includes various discounts on ticket purchases and in-flight amenities (WizzAir, 2017);

[9] For example, WizzAir charges excessively for services requested by phone (which is also paid line) that may be found on their website (WizzAir, 2017)

similarly, Spirit Airlines offers a program which earns you savings on vacation packages, future flights and luggage fee discounts (Spirit Airlines, 2017).

As low-cost carriers rarely use travel agency or third-party providers for their ticketing services, and since most of their operations regarding issuing tickets, checking-in, customer feedback surveys and other pre-flight and post-flight activities happen through web-portals and mobile applications, in general, relationship is maintained mainly online.

- ★ ***Dedicated frequent flyer programs and subscriptions***
- ★ ***Online support***

3.6. Revenue stream

As a result, the company generates ***revenue streams*** associated to its services. The customers pay a fairly low fare for air transportation. However, the price paid for a seat is the main cash generator for a low-cost airline[10]. Usually, the revenue varies and cannot be specifically determined or stated how much more or less the company earns from extra amenities compared to ticket prices. For example, let the cost of booking a flight with a low-cost airline is X; then, adding luggage, seat selection, travel insurance, ground services, or paying for food and beverage on board, may well exceed and even double X. As per easyJet's 2016 Annual report statement, the revenue stemmed from selling solely the flight service equals about 90% of the total company revenue. Hence, the other 10% are associated by a mixture of extra services and amenities, government subsidies, rights, and additional income generators. All in all, the expected revenue is what drives LCCs to follow their selected strategical business plan. The total income should be in excess of what the company expects to spend with its current cost structure. Low-cost airlines apply dynamic pricing techniques for their base product, which allows them to charge different prices for the same route, for example depending on seasonality. This is an important key pricing strategy for them to generate excess profits.

However, such extra services are available for an additional, sometimes excessive fee. There may be food or beverages available on board, or a seat with extra leg space, but then the customer would need to pay for it on top of the fare that was already indicated to the flight fare.

[10] Specific data is presented in the next chapter, where information from Annual Financial Statements of 10 low-cost airlines is presented and used

3.7. Key resources

Achieving a low price is not a simple outcome; but how do low-cost airlines make it happen? LCCs tend to take every expensive part of air travel service and make it less expensive. Such topic mainly concerns the available ***key resources*** which an airline owns. First and foremost, these are aircraft. Aircraft type and fleet commonality is something somewhat natural to the low-cost airlines concept (Braggen & Klose, 2010). Furthermore, the bigger the fleet, the more opportunities there are for the airline to expand their network more. Therefore, it can be assumed that one of the most important reasons why companies like Ryanair and easyJet grew to the levels where they are today is the big orders these companies placed.

For example, Ryanair placed a few years ago an order of additional 110 planes with option for 110 more (see Appendix 1).

Moreover, acquiring one specific type of aircraft gives the opportunity for utilizing this type of aircraft in the most optimal way. In his book "Why can't we make money in aviation", Adam Pilarski proves that high profits are well linked to acquiring "more expensive but technologically superior and less expensive to operate equipment" (Pilarski, 2008). From supply perspective, placing large orders is usually linked to getting a bulk discount, which results in substantial economies of scale; hence, large orders do compensate for newer and more expensive aircraft.

Acquiring new aircraft is not something that comes off as natural thing to do when it comes down to low-cost airlines. Capital expenditures may seem not linked to the low-cost idea. However, acquiring new aircraft is essential for improving the efficiency of the operations[11]. A younger fleet means increasing fuel and operation efficiency. Fuel is the highest cost element for all transportation operators, no matter if it regards a ground, water or air operational activity. Therefore, fuel efficiency of using a younger fleet must offset all the extra capital expenditure costs of acquiring newer resources, in the face of fleet. In the same book of Pilarski, mentioned in the previous paragraph, the author presents specific data that establishes the average operating cost of a Boeing 737-800 to be astonishing 5.3 cents per seat mile (Pilarski, 2008). On this note, Boeing 737-800 is the one of the most popular aircraft among the low-cost airlines; the two biggest airlines in Europe and USA, respectively Ryanair and Southwest Airlines, utilize exactly this type of aircraft (Airfleets, 2017). As a result, LCC need to be able to keep close relationship

[11] For example, Ryanair reports in its Annual Financial Report for 2015 a decrease in Fuel costs, but increase in the operating profit, which leads to the assumption of efficient aircraft utilization (Ryanair, Financial report 2015, 2016).

with the supplier of the main resource (aircraft) so to exploit economies of scale and options for further fleet expansion

Furthermore, as already noted above, fleet commonality is a typical characteristic of low-cost airlines. For example, easyJet and WizzAir operate only aircraft of the Airbus A320 family, while Ryanair and Southwest Airlines own only Boeing 737s. This would result not only in specializing of using certain type of aircraft, but also in accolades such as savings in staff training or acquiring equipment. Hence, aircraft choice is vital for any airline for another important reason. It addition of it being expensive resource, which needs a lot of maintenance checks, and is essential for the normal performance and operations of airlines (Belobaba, et al., 2015), the crew of every type of aircraft requires specific training. Therefore, fleet commonality relates to training the crew uniformly and allowing the crew to serve on any transportation node. Pilots and flight attendants, mechanics and clerk attendants need to be trained only for 1 aircraft type, which saves time of the required full training; hence, extra costs connected to the training Airlines invest great amount of not only money but also time to make sure the crew is well-prepared and completely familiar with the duties they need to fulfill.

Aircraft and crew are the two most essential needs for an airliner to operate normally and properly. Similarly to handling their fleet with attention when it comes to maintenance, airlines pursue programs and follow frameworks to stimulate their staff and keep them for a longer term and avoid high human capital turnover and consequent training expenses for new hires.

- ★ ***Fleet***
- ★ ***Crew***

3.8. Key activities

The most valuable ***key activity*** of a LCC is to keep their plane off the ground as long as possible, i.e. to make the plane generate cash. In this sense, aircrafts are the cash cows of the airline industry. This task requires complex considerations regarding analytical and historical aspects of the company´s performance. First, the management and the planning team need to be sure about the schedules built for an aircraft to follow – if they are too narrow, then there is a higher risk of delays and disruptions of the schedule which the company is willing to apply. Then, based on scenarios and analysis of historical performance, the company is able to organize its operations and flight timetables in ways that the utilization rate is always in the 80-90% range. As sometimes there are weather abnormalities, aircraft may need a longer time to approach an airport before landing or to stay on the taxi way before hitting the runway. Therefore, the

utilization rate should never be close to 100%, as to avoid the risk of over-abusing the aircraft, which is a risk that no airline can take. Further to the planning and scheduling activities, which main aim is to reduce the turnaround time, maintenance takes a big part of the time spent on an aircraft to make sure it is capable of flying at high utilization rates. For example, in the case of Southwest Airlines, the company's bloggers report that the company spends between 12 and 50 days (or between 288 and 1,200 hours) of heavy maintenance on their aircraft every two years (Southwest Airlines, 2008). This means that the company spends between 2% and 7% on a yearly basis to perform checks on their planes.

Using an airport where traffic is not as big as it is at big airports close to metropolitan areas hides another vital idea of the low-cost airlines concept. The less busy an airport is, the smaller the chance of eventual delays and timetable disruptions will be. One of the biggest advantages low-cost airlines is their ability to reduce the turnaround time[12] down to 30-40 minutes between inbound and outbound flight service. Working on such a tight schedule, unlocks the opportunity for the aircraft to be used more for flying and so, generating revenue. However, important note here is that there are restrictions on the amount of time an airplane can be used per day, or what is called daily block time (Belobaba, et al., 2015). It usually varies for different types of aircraft; for example, narrow-body planes such as Boeing 737s and Airbus A320s, aircraft types mostly used by low-cost airlines, usually equal a daily block time of 11-13 hours (MIT, 2017). For example (table 2), let's build a possible schedule for a easyJet aircraft, keeping in mind that it can fly on multiple routes throughout the day and fit in a block time of maximum 13 hours. In this example, the plane operates 6 flights for a total of 12 hours and 45 minutes. So, if the plane is actually allowed to operate for duration of 13 hours, then its utilization rate is 98% as per the example in Table 2. This calculation theoretically confirms the principle that low-cost airlines strive for as higher utilization rate of their aircraft as possible.

From	Departure time	To	Arrival time	Total travel time
Amsterdam	7:20 AM	Bordeaux	9:05 AM	1hr. 35 min.
Bordeaux	9:40 AM	Amsterdam	11:30 AM	3hr. 25 min.
Amsterdam	12:00 PM	Prague	1:30 PM	4hr. 55 min.
Prague	2:00 PM	Amsterdam	3:35 PM	6hr. 30 min.
Amsterdam	4:45 PM	Palma de Mallorca	7:15 PM	9hr.
Palma de Mallorca	8:00 PM	Amsterdam	10:45 PM	12 hr. 45 min.

Table 2 Example schedule of easyJet aircraft G-EZOA (Airbus A320-214) on 23 June 2018[13]

[12] Turnaround time is the total amount of time from the moment the plane stops moving (taxiing) to the moment it starts moving again. This includes passengers getting off the plane, crew setting up the plane for the next flight – flight attendants perform several checks in the cabin, while pilots check on their systems, and finally, boarding of all passengers for the next flight. (Belobaba, et al., 2015)

[13] Data exported from web-based tool https://www.flightradar24.com/

LCCs use many different airports as bases where they can leave the plane overnight or change crew, or else. However, connections are not something common for most low-cost airlines. In case of a delay, a connecting flight would cause even further delays in the already tight schedule of the LCCs. Furthermore, if a passenger goes from A to C through B and the airline offers such connection, then in B, the operator needs to hire ground crew that would support with luggage and checking (Belobaba, et al., 2015). So, connecting flights is something that low-cost airlines tend to avoid, as this saves the company money. This statement is in accordance to the point-to-point operations of low-cost carriers. On the other hand, in the United States for example, airlines such as jetBlue, Spirit Airlines and Southwest Airlines offer increasing number of connecting flights. This is an interesting element of the evolution of the low-cost airlines business model which distinguishes between low-cost airlines on a geographical level. Somewhat similarly, in Europe, airlines such as Ryanair for example are establishing partnerships with other airlines for long-haul travel rather than offering connections within its own network (Ryanair, 2018).

Additionally to their main operational activities related to flights services, many airlines currently spend time and money on is IT support of their web and mobile products. This aspect is crucial as LCC's product is mainly available through the Internet and mobile applications. Not only maintaining the web product, but also making it simpler to use, in accordance to the non-complexity of the final product, requires strong attention and high efficiency of the web-content as a pre-flight service.

Thus, the main key activities of LCC are:

- ★ ***High utilization of aircraft***
- ★ ***Low turnaround time***
- ★ ***Point-to-point service***
- ★ ***Friendly and easy to use IT product***

3.9. Key partners

A successful strategy also suggests successful ***partnerships***. In the case of low-cost airlines, they are vital and can be found in the face of airports and third party suppliers.

It was already noted in the first point – low-cost airlines tend to avoid big international hub airports and focus more on distinct from the city-area airports (Schaafsma, et al., 2008). The latter are far less expensive than the former. There are exceptions such as Schiphol being an airport of primary use for easyJet (easyJet, 2015). However, keeping the example within the

territory of The Netherlands, only low-cost carriers would operate at airports like Eindhoven, Maastricht, and Groningen. On the other hand, low-cost carriers in North America use for bases (and sometimes hubs) big international airports – for example jetBlue (JFK airport, New York).

In addition, big international airports would charge much more for landing fees since there are less available slots for operators[14]. Although less frequent, in cases when low-cost carriers use larger airports, LCC would fly at less busy hours, when passenger traffic for FNSC is lower. Utilizing smaller airports allows the LCCs to exploit a huge bargaining power in negotiating and lowering airport fees. If a low-cost airline sees the opportunity to grasp on a distant and less utilized airport, then they will most probably make most of it, but only if cooperation is achievable. For instance, if airports that are blooming, thanks to the interest of low-cost airlines, raise their fees and taxes or provide too expensive terminal services, then they may lose their (single) attractiveness; as lower cost is what is bringing airlines attention to them. Then, cooperating and understanding each other's business needs is of a huge importance for both low-cost airlines and smaller airports of LCCs' interest. The gain for the airport would be that it will re-emerge from being a less used and distinct to more frequently visited and utilized (hence, cash-generating). Such a synergy is vital for the existence and the operations of both smaller airports and low-cost airlines.

Further, there are suppliers such as aircraft manufacturers, who may offer additional maintenance service or less expensive (discount) options on offering and selling more aircraft to their partners. Such an idea is indeed important for LCCs as they are characterized by fleet commonality.

Also, fuel suppliers, cleaning companies, catering and training facilities are other very important "factors" which lay in the concept of the low-cost airlines business model. Recently, low-cost airlines also offer travel insurances, which they provide in accordance with insurance companies. Also, a relatively new aspect of the LCC product is to provide the opportunity to book accommodation or rental cars through the company's website together with the flight service. Such a service requires trustful and strong bonds with travel agencies and rent-a-car companies, which make the list of key partners even longer, but complete.

Hence, a LCC would maintain relationships with:

- ★ ***Aircraft manufacturers and equipment supplying companies***

[14] This statement is based on the chapter Airport Pricing of the book Airport Competition: The European Experience (Forsyth, et al., 2010)

- ★ ***Smaller, regional and less-busy airports***
- ★ ***Other third-party suppliers such as travel agencies, car rental and accommodation companies, travel insurance providers, catering and cleaning business partners***

3.10. Cost structure

Finally, all the decision factors, resources, partnerships, activities, and the value proposition itself form a complex of ***costs*** combined into a fairly simple ***structure***. Hereby lays the main accolade of the low-cost companies: make the complexity less complex and the expensive less expensive. As a result of what was discussed above, provided are the cost categories most reported by low-cost airlines[15]:

- Aircraft acquisition expenditures and maintenance costs;
- Fuel costs;
- Ground and handling costs;
- Personnel costs;
- Airport taxes and fees and other route charges;
- Other operational and administration expenses.

The cost structure segment of the business model canvas represents the most essential part for any cost-focus company. Low-cost airlines follow cost-driven model which involves more fixed costs, which are easy to predict and are almost constant over time, and less variable costs. For the purposes of following such a strategy, low-cost airlines assume constant (average) demand for their flight services. The latter, in combination with information about the historical performance of the company, allows the management to organize an appropriate cost structure.

3.11. Low-cost airlines business model canvas

As a result, the generic low-cost airlines business model canvas (Figure 5), shall include:

- Low fares;
- Durable key resources leading to sustainable competitive advantage, not forgetting that the value of the resources should be appropriable (Barney, 1986);
- Expenditure decisions which increase the operating efficiency;
- Fleet commonality;
- Limited in-flight services;
- Strong relationship with suppliers and key partners;

[15] These will be reviewed with exact figures in Financial reports of 5 European, 4 US and 1 Canadian low-cost airlines in the next chapter

- High aircraft utilization rate and less to none connecting flights;
- Keep the product simple.

Key partnerships	Key activities	Value proposition	Customer relationship	Customer segments
Airports Aircraft manufacturers Fuel suppliers Cleaning companies Travel and rent-a-car agencies Catering and restaurant facilities	Fleet planning and maintenance checks IT support **Key resources** Aircraft Crew	Air travel service Extra services with additional surcharge Reliance Travel insurance Ground services Accomodation Rent-a-car	Online support Self-service through web and mobile platforms **Channels** Website Mobile application Advertisements	Price-cautious leisure and business travelers Passengers willing to pay only for the service they need
Cost structure			**Revenue streams**	
Aircraft acquisition and maintenance costs Fuel costs Personnel costs Airport taxes and other route costs			Ticket fares Additional booked services Additional in-flight revenues Government subsidies	

Figure 5 Low-cost airlines business model canvas

Figure 5 is refurbished version of the business model canvas approached through the lenses of the airline industry. It combines all of the main characteristics and strategical principles of the low-cost airlines business model and provides a clear view of how low-cost airlines function.

At glance, on a business model canvas level, it can be considered that there is a uniform way of utilizing the low-cost airlines business model on the customer side (right side of the business model canvas). This can be admitted as true as not only the product which airlines offer is somewhat identical, but LCC also tend to maintain their relationship with customers through similar internet-based channels.

On the left side of the business model canvas, which relates to everything a company does so to deliver its value proposition, several differences may be outlined between low-cost airlines, if compared on a geographical level.

In regard to key activities, it was already noted that low-cost carriers utilize different types of flight networks. In Europe, the low-cost airlines business model is mainly using point-to-point flights network, whereas in North America, and mainly USA, airlines tend to use more often the “rolling hub” model: rather more complex than either hub-and-spoke or point-to-point, rolling hub model allows low-cost carriers with multiple bases (or even larger FNSC with more

than one hubs) to evenly spread scheduled flights throughout the day among all of their focus airports (Cook & Goodwin, 2008). Additionally, such shift from point-to-point to rolling hub model provides an opportunity to low-cost airlines to offer connections between flights in their network, what is the case of LCC such as Spirit Airlines (Las Vegas), jetBlue (New York), Allegiant air (Orlando), Southwest Airlines (multiple hubs: Atlanta, Denver, Las Vegas, Chicago, Dallas, etc.)[16].

Another operational (and strategical) difference is that LCC in North America use larger and busier airports in comparison to European LCC. While low-cost airlines such as easyJet and Ryanair expand by mostly utilizing smaller and regional airports or airports in developing areas and countries (with rare exclusions like easyJet using a terminal at Schiphol), one of Southwest Airlines' bases is the busiest airport in the world for 2017 (Business insider, 2018). Furthermore, European LCC such as Ryanair form alliances with other airlines (Air Europa), which attributes to their network long-haul intercontinental flights.

In additional to differences in their key activities and partnerships, as outlined in the paragraphs above, there may be added more differences in the way of utilizing the LCC characteristics in respect to strategical and managerial decisions (left side of the low-cost airlines business model canvas). A brief example are crew remunerations (key resources) as in Europe flight attendants and pilots tend to be paid much lower than in USA[17] (ILO, 2008). As a result, it may be concluded that there is difference in the way of operationalizing the LCC business model on a geographical level. Further, such difference (on the left side of the business model canvas) is expected to be have influence on the cost structure between European and North American low-cost airlines and as a result, in the performance which airlines achieve. Therefore, performance indicators can provide evidence on what is the difference in the way the low-cost airlines business model is operationalized in Europe and North America.

Part II.6 had already reviewed how performance can be measured in general, however, evaluating the principles of the low-cost airlines business model showed that there are particular strategical and operational decisions which differentiate LCC on a geographical level. Airlines performance then can be further evaluated by focusing on industry specific performance indicators, which are explained in the next part.

[16] Information collected from the respective airlines' websites
[17] The differences in costs of staff will be further reviewed later in the research

4. Key performance indicators in the airline industry

The following paragraphs present a summary of the most common KPIs which airlines tend to report. Statements in this part are based on publications and annual reports by IATA, ICAO and 10 low-cost airlines, which will be reviewed in the next part. Further, three books focusing on the airline industry are collectively used for the purposes of this part in describing the KPIs of the airlines industry – "The Global Airlines Industry" (Belobaba, 2015), "Flying off-course" (Doganis, 2010) *and "Straight and level – Practical Airline Economics"* (Holloway, 2008).

The airlines industry consists of vast business model ideas. As a result, assessing the performance of an airline using identification of single metrics is quite challenging and ambitious. For instance, if a big national carrier serves 5 times more destinations than its low-cost local competitor, this does not necessarily mean that the latter is performing better or worse. Number of seats per aircraft or number of employees may be intriguing statistical figures but they cannot describe airline performance. Key indicators of airlines performance are integrated within industry-specific data, which will be described in the following paragraphs.

Broadly known fact, KPI is a measure which both describes (to a certain level) and shows (predicts) the performance of an organization. IATA and ICAO associate KPIs, but also airline and airport performance, mainly with levels of safety, security, environmental protection, efficiency, continuity, following law frames, fuel consumption (ICAO, 2009; IATA, 2017). However, airlines report other KPIs that are not only industry-specific but also business-specific. Such KPIs are commonly accepted and frequently used when evaluating airline performance, as such defy to a certain extent airlines performance over a specific period of time. There are several main categories in which commercial aviation KPIs can be grouped. The main interest of this thesis falls on 4 groups:

- Traffic-based indicators;
- Financial-based indicators;
- Operations-based indicators;
- Load-factors (productivity).

This is not a categorization split by definition and commercial aviation KPIs can be divided and grouped in many ways. The reason why the KPIs presented in the following paragraphs are the ones selected is that they are the most widely used and consistently reported figures by any airline.

4.1. Traffic based KPI

Traffic-based indicators include Available Seat Kilometers/Miles (ASK/ASM) and Revenue Seat Kilometers/Miles (RPK/RPM). ASK/ASM is a measure which presents the available number of seats per kilometer/mile flown and defines the capacity (*supply*) produced by an airline. RPK/RPM measures the revenue passengers (paying passengers) transported per flown kilometer/mile (*demand*). These traffic-based indicators can be used in a similar way by cargo airlines as seats and passengers are replaced by tons (or other weight units). For example, if an airline flies 100 km with a plane that has 175 seats and has sold 140 tickets for this flight, then the ASK is 17,500 and RPK is 14,000. These figures are often one of the most important KPIs for airlines, as they serve use for calculating other performance indicators.

i. Available seat kilometers

One of the most utilized KPIs in the airline industry is available seat kilometers. It is equal to the capacity produce by the airline (number of seats) multiplied by the distance flown:

$$ASK = Number\ of\ available\ seats\ x\ Distance\ flown$$

Equation 8: ASK (source: Belobaba, 2015)

Therefore, this indicator, usually reported in millions, is only providing information for the available capacity produced by airlines and the distance travelled. Produced capacity of an aircraft, however, needs to reflect properly the forecasted demand for the serviced routes. No matter how high demand is for a flight service, a plane cannot transport more passenger than the number of available seats. As a result, ASK turns to be important figure in regard to the maximum traffic airlines can transport. In a way, this can be interpreted that ASK sets the frame of maximum passenger traffic for the network of an airline. ASK plays important role in defying other performance indicators, will be reviewed in this part.

ii. Revenue passenger kilometers

RPK (revenue passenger kilometers) can be explained as determinant which identifies the demand for the flights serviced by an airline.

$$RPK = Number\ of\ passengers\ transported\ x\ Distance\ flown$$

Equation 9: RPK (source: Belobaba, 2015)

In other words, RPK provides information about the passenger traffic and distance travelled within the airline's network. Similarly, to ASK, RPK can be used for ground for other performance indicators which are reviewed in this part.

4.2. Financial KPI

Chapter II.6 (p. 20) already reviewed mainly financial indicators for measuring company performance in general. Here, the focus is on specific for the airline industry financial indicators.

Financial indicators identify what the traffic-based indicators mean in terms of operating profit or terms of revenue and costs. Unit cost and unit revenue (respectively cost per ASK/ASM or CASK/CASM and revenue per ASK/ASM or RASK/RASM) are respectively the incurred operating expense and the generated operating revenue per one ASK/ASM.

$$RASK = \frac{Revenue}{ASK}$$ Equation 10: RASK (source: Belobaba, 2015)

$$CASK = \frac{Costs}{ASK}$$ Equation 11: CASK (source: Belobaba, 2015)

Continuing from the previous example, if the same airline incurs €17,500 of costs and the revenue stream is €21,000 for the same flight, then the unit cost is ($\frac{€17,500}{17,500}$) €1 per ASK (or units) and the unit revenue is ($\frac{€21,000}{17,500}$) €1.20 per ASK (or units).

Revenue can also be measured as dependent on RPK. As per the same example as above, the revenue per RPK, or also called yield, is ($\frac{€21,000}{14,000}$) €1.50 per RPK (units).

$$Yield = \frac{Revenue}{RPK}$$ Equation 12: ASK (source: Belobaba, 2015)

Then, the formula for operating profit, known from economics: profit/loss equals the difference of revenue and cost, can be further specified for the airlines industry as:

$$\begin{aligned} &Operating\ profit = \\ &= Operating\ revenue - Operating\ expense = \\ &= (Revenue\ units - Cost\ units)\ x\ Transported\ units = \\ &= RPK\ x\ yield - ASK\ x\ CASK \end{aligned}$$

Equation 13: Operating profit defined through the prism of the airlines industry's KPIs

However, excluding any of the aforementioned financial key performance indicators may lead to a wrong conclusion about the performance of the airline (Belobaba, et al., 2015). In general, this statement would mean that any of the financial indicators would not be meaningful only on its own, but rather needs to be combined with other indicators so to be able to grasp on the performance level achieved by the airline. This formula may also be used as verification and validation test for the reported operating profit or individual financial indicators in airlines reports.

4.3.Load factors (productivity KPI)

Productivity KPI are % figures which use ratios of traffic and financial indicators for indication of the utilization of a flight or series of flights over a specific period of time.

In the same example which was used above, the **load factor** of that flight is equal to the number of paying passengers to the number of seats available or 75% (= $\frac{140}{175}$). In case of more flights, it is possible to calculate an average leg load factor or average network load factor which respectively present the load factor for a certain route or load factor over the whole network of flights.

Load factor is important because it provides the management with important data which allows to evaluate the operational effectiveness of the airline and in such way – its operational performance. However, estimations about profitability are achieved by calculating the break-even load factor, which is a measure that is usually rarely reported by the airlines in their statements but can be computed by combining LF with Financial KPI.

i. Break-even load factor (BELF)

In order for the company to be profitable, the cost per ASK (or CASK) has to be lower than the revenue per ASK (RASK), so the company can generate profit. Therefore, the break-even point is set when RASK equals CASK.

First, let's re-write the formula for RASK in the following way:

$$RASK = \frac{Revenue}{ASK} = \frac{Revenue}{ASK}\ x\ \frac{RPK}{RPK} = \frac{Revenue}{RPK}\ x\ \frac{RPK}{ASK} = Yield\ x\ LF$$

Equation 14: Estimation of the revenue per available seat kilometers

Then, if the break-even point is set when RASK = CASK, then BELF equals:

$$RASK = CASK = \frac{Revenue}{RPK}\ x\ BELF <=>$$

$$BELF = \frac{CASK\ x\ RPK}{Revenue} = \frac{Costs}{ASK} x \frac{RPK}{Revenue} = LF\ x\ \frac{Costs}{Revenue}$$

Equation 15: Formula for break-even load factor (BELF)

On this note, equation 15 can also be rewritten to $BELF = \frac{CASK}{Yield}$. however, not all airlines from the selected set in the following chapter (IV.1.4) report in their financial statements and annual reports figures for CASK and yield, whereas they report LF, costs and revenue.

Then, it can be answered what does the BELF indicate exactly? BELF is a product of two elements:

- LF - as a ratio between a capacity and demand measures, it provides a clear idea of the organizational planning management adequateness of the airline and its successful market awareness.
- Expenses and earnings do not give a basis for comparison between companies in the sense of performance measuring. However, relating one to another, or costs to net result, or revenue to net result, would provide much more insight about the profitability of the company and in this sense, about the performance of any company.

Computation of the BELF is important for any airline, because it grasps on if the capacity that is produced is actually being used (LF), but also because it gives a clear identification if the airline is operationally profitable. After assessing BELF and as long as it exceeds obtained LF figures, the only negative results (loss) can occur due to tax expenses and interest fees[18].

4.4. Operational KPI

Operations-based indicators are non-financial figures which the airlines report in their annual reports or corporate and governance publications. Such figures represent data which solidifies the company's performance in respect to its daily operations. Operational key performance indicators serve well in distinguishing what makes an airline profitable and can be used as a reliable measure of airlines performance. Operational key performance indicators include:

- Aircraft productivity, which can be measured as:
  - Utilization rate of the aircraft or a ratio of how much time the aircraft flies in respect to the block hours that it is designed to fly per day;
  - Average number of ASK for a specific time-period per aircraft;
- Labor productivity or average number of ASK per employee;
- On-time performance (OTP) - % of flights which arrive within a certain amount of time of the scheduled arrival time;
- Average delay – the time (minutes) of delay between the moment of arrival and the scheduled time of arrival;
- Number of missed connections;
- Cost of delay.

[18] Such a tax-related loss case is Norwegian Air Shuttle in 2014

Among the above, OTP is considered a very important figure for low-cost carriers as the key to success of low-cost airlines is to utilize their aircraft as much as possible; aircraft generate cash only if flying. Then, performance can be measured in respect to how well the airlines apply their resources, similarly to what is conceptual for LF. Delays lead to schedule disturbances; hence, punctual arrivals and departures are important for the flawless operations in the sense of accuracy to the established flights timetable. On-time performance is strongly linked to firm performance (Droge, et al., 2004) and therefore is a proper indicator for company's success. In the case of low-cost airlines, on-time performance solidifies the ability of the airline to achieve operational success and accuracy, as this reduces timetable discrepancies and increases the airline's customers' appreciation and willingness to pay (Homburg, et al., 2005). In addition, OTP turns to be a very influencing KPI for the travelers' satisfaction in regard to their future relationship with the airline.

5. Relationship between airline performance indicators and business model canvas

In the previous part and in the last part of the chapter II.6 (p. 20) the focus falls respectively on commercial airlines key performance indicators and overall market performance indicators. Together, they provide insightful information about the results of the operational activities and strategical adequateness of airlines' managerial decisions. Similarly to the end of the chapter II.6 (page 24), here, commercial aviation KPIs will be linked to the BMC's blocks.

- Based on the description of ASK, ASK is a figure which derives the produced capacity by an airline. Airlines exploit the most benefits when RPK is as close as possible to ASK. If there is a shortage of seats, this may result in increased passenger fees; however, excess capacity will have the contrary effect and is impacted further by the higher fixed costs associated with providing more seats. Therefore, although ASK is related to supply and can be intuitively linked to the left side of the business model canvas, it actually has a distributed effect on both the ***cost structure*** and ***revenue streams***. Similarly, this statement applies the other way around to RPK; the same theory is also appropriately applicable for RASK, CASK, and yield as ratios between the realized cost or revenue per seat or passenger;
- Operating profit was expressed as a formula of RASK**,** CASK, yield and ASK in part 4.2. (p. 43). However, operating profit now will be evaluated here as the difference between operating revenue and operating expenses:
  - Operating revenue of low-cost airlines may be split in two: seat revenue and non-seat revenue. The latter includes in-flight services, which are usually provided by FSNC, may include drinks, baggage fees, flight adjustment charges, food on board and other;

these are rarely provided by LCC as a complimentary service and therefore are a key generator for excess revenues (Fageda, et al., 2014). Therefore, this part is strictly related to the ***right side of the canvas*** and plays vital role for the ***value proposition***.

- ❖ Costs are not only part of the name of the business model they use, but they are also an essential factor and indicator for the success of low-costs airlines. As it was already earlier, the main idea of low-cost carriers is operating on minimal costs. Low-cost carriers in Europe and North America report their expenses in a non-uniform way; however, they all report separate from one another the main spend areas of their operations: fuel, airport and ground handling, staff, maintenance, and other costs, including expenses for navigation, sales, marketing, aircraft dry leasing, amortization and depreciation, net interest payables and gains, and route charges. Logically, these type of expenses have a strong effect on the ***cost structure*** of the business model, but they are also derived from the ***key activities*** and the ***key resources*** utilized by the airline.

- LF is a general measure for the capacity utilization. The higher the LF, the closer RPK is to ASK, and respectively the closer is the demand to the capacity produced. If LF increases, this means that demand is increasing as well. If both LF and ASK are increasing, this is most likely happening in parallel to demand growth as well. Therefore, increase of LF means increased opportunities of generating higher profits. Conclusively, increased capacity and capacity utilization are dependent on demand, hence increase in LF is always a positive sign for the airline's operational and market success. However, the level of LF is only positive if it is higher than the estimated BELF as it indicates the moment when the operational activity of airlines are associated with profitable characteristics. As a result, the LF and BELF are indicators which cannot be firmly connected to one of the business model canvas blocks, but rather, can be synced with the ***overall orchestration of the LCC business model***.
- OTP is somewhat similar to LF and BELF as it is associated with the final result of the operationalization of the business model. It shows nothing else but the efficiency of the operational activities of the airline. Stated in such way and keeping in mind that the operational efficiency is mainly linked to the left side of the business model canvas. However, neither the key activities, nor key partnerships, nor key resources are directly impacted by OTP. Rather, disturbances in OTP can be associated with impact from the cost of delay, additional staff workload and extended in time activities. As such, unexpectedly low OTP can influence the ***cost structure*** of the low-cost airlines business model.

As a result, Figure 6 illustrates the composite structure of combining the described airlines KPI above and overall market performance indicators with the business model canvas (p. 15).

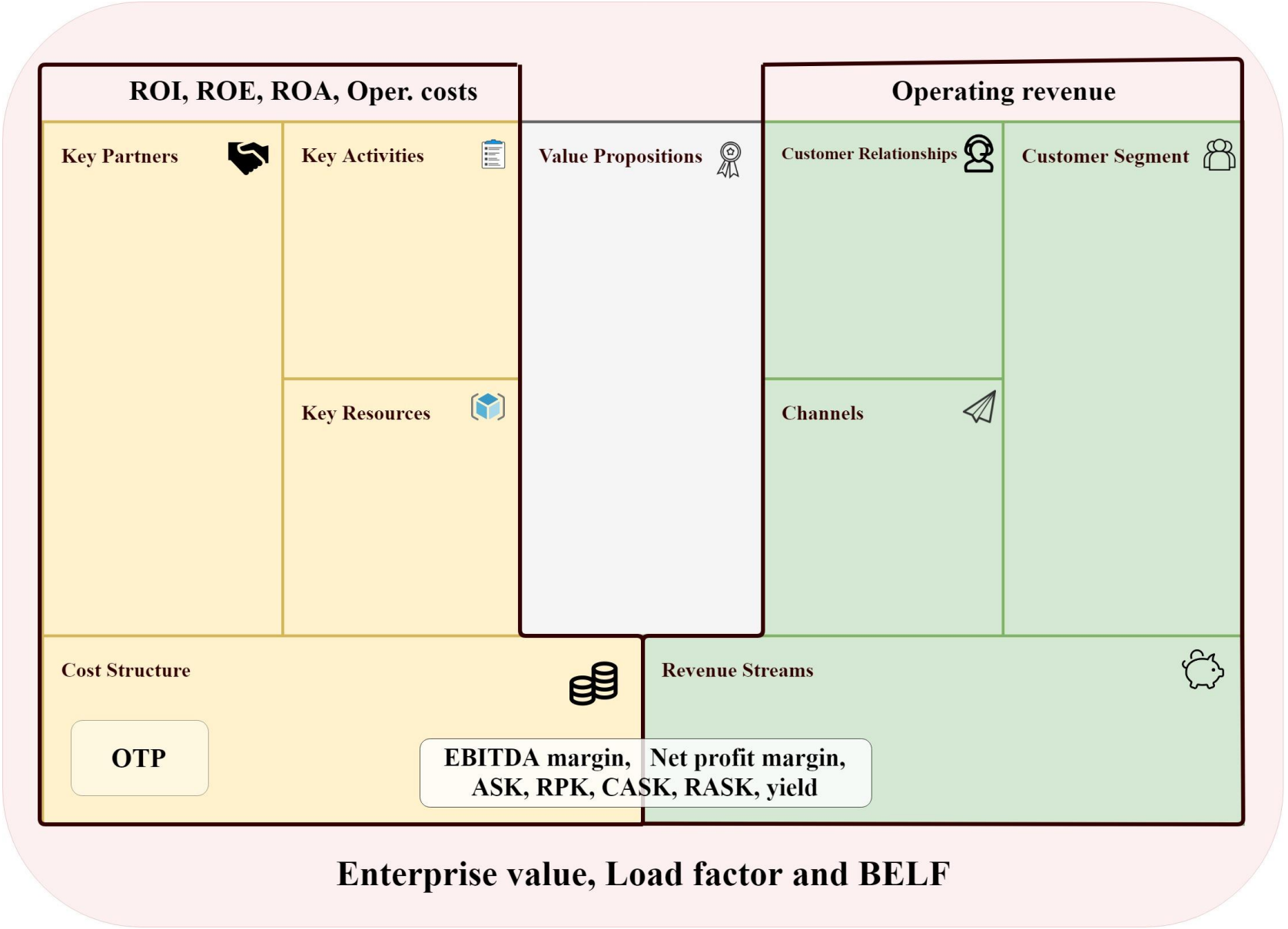

Figure 6 Business model canvas through the lenses of the low-cost airlines business model and its relationship with (overall) market performance indicators and (industry-specific) commercial airlines key performance indicators

IV. Data and methodology

Abstract of the chapter

While the first two chapters introduce the theoretical frameworks of both business models and the essentials of low-cost airlines, this chapter brings them together and evaluates the performance achieved in terms of overall market performance indicators, airline key performance indicators and profitability. First, the criteria for selecting LCC for this research is described. Then, the collected data is analyzed. Two sample t-tests are performed with the purpose of determining is there a difference in the way the low-cost airlines business model is operationalized in Europe and North America. The results of the statistical tests are then discussed.

1. Airline selection criteria

1.1. Low cost airlines

The main topic of this thesis work is the low-cost airlines business model. Hence, first criteria is for the airline to operate only as a low-cost carrier. As it was already described in chapter III, the low-cost airlines business model emerged as a consequence of removing the price-floor of airline tickets and the liberalization of the air travel market. As a result, FNSC were challenged by the up-and-rising low-cost airlines business model and its new market dimensions. Consequently, FNSC replied on this with reduced ticket fares, but also by forming low-cost operating subsidiaries which will "compete with low-cost operators on their own turf and terms" (Centre for Aviation, 2009). However, such business relationship may influence the performance of low-cost carriers in many ways, mainly financially as parent companies tend to invest (financial) resources to their subsidiaries. Therefore, low-cost airlines, which are owned by a parent company, operating as a FNSC, or low-cost airlines, which are merged or acquired by a FNSC and do not operate fully on their own as a business unit, will not be part of the following analysis. Such examples are (1) Transavia: operating as a low-cost airline, but owned by KLM Royal Dutch Airlines, hence, a member of the Air France-KLM Group (Transavia, 2017), and (2) Vueling: operating as a low-cost airlines, owned by International Aviation Group (IAG), which owns also respectively UK's and Spain's flagship national airline carriers British airways and Iberia (Reuters, 2013).

1.2. European and North American operations

This geographic scope of this analysis covers Europe and North America. These two regions represent the air travel market with highest share of seats flown (2016) by low-cost airlines (see Appendix 2). Compared to the third market in this ranking, Asia Pacific, the share of seats flown

by low-cost airlines in Europe and North America is respectively 2.5 and 2 times more. This suggest higher utilization of the low-cost airlines operation in these regions. Hence, only low-cost airlines, whose operations are based in Europe or North America are considered under these geographical criteria.

1.3. Publically traded companies

The final step before finalizing the selection of airlines, is based on if the company has successfully completed an initial public offering (IPO), i.e. is listed on a stock exchange market. Such criteria allow safe and secure access to sensitive data and company records. Publically traded companies announce their achievements as a corporate structure and this information is accessible freely through various sources. Every publically traded company announces their results on their respective investor relations platforms and all figures are reported after auditory validation. Therefore, such a condition, applied for the selection of participating low-cost carriers, affirms usage of reliable and valid data.

1.4. Selected set of airlines

The approach that is followed starts from finding out which airlines operate under the low-cost airlines business model. A reported list of all low-cost airlines[19] is used in order to select all companies, which operate under the low-cost airlines flagship and are located in Europe and North America. Then, every company that is still actively operating is looked up and assessed if it is a part of a bigger company structure and has a direct relationship with a FSNC or an airline alliance or group. Finally, from the remaining, only the ones that are listed on the stock exchange are considered further for participating in the conducted analysis.

Airline	Region	Ticker	Share price €	MCAP in mln. €	EV in mln. €
Southwest Airlines	USA	LUV US	€ 54.44	24,860.7	25,213.1
Ryanair	Europe	RYA ID	€ 15.05	17,690.0	17,946.0
jetBlue	USA	JBLU US	€ 18.58	5,965.0	6,385.9
easyJet	Europe	EZJ LN	€ 16.47	5,483.2	5,078.0
Spirit Airlines	USA	SAVE US	€ 37.31	2,544.2	3,045.2
WizzAir	Europe	WIZZ LN	€ 41.40	3,806.6	2,859.2
Norwegian Air Shuttle	Europe	NAS NO	€ 17.82	639.5	2,952.9
Allegiant Air	USA	ALGT US	€ 128.72	2,068.1	2,694.3
WestJet	Canada	WJA CN	€ 17.50	1,996.3	2,445.1
Pegasus Airlines	Europe	PGSUS TI	€ 7.42	472.5	908.9

Table 3 Selected set of low-cost airlines (data source: Bloomberg Finance L.P., 31 December 2017)

[19] The link towards the list can be found in the Bibliography section. This list includes all low-cost airlines, both the ones that are still operating and the ones, which ceased operations, the information is presented by presented in the "Global Air Transport Outlook to 2030 and trends to 2040" by the International Civil Aviation Organization. (ICAO, 2013)

The final selection consists of 4 US and 1 Canadian airlines as representative for North America, and on the European side – 1 Irish, 1 British, 1 Norwegian, 1 Hungarian and 1 Turkish (based in Istanbul[20]) airlines. Table 3 presents all airlines namely.

Furthermore, Table 3 presents stock exchange data about each of the airlines' tickers, under which the companies are listed on the stock exchange market. The corresponding share prices are as per close of 2017. The respective Market capitalization and Enterprise value figures for each airline are converted to Euro as per the X-rate of the same date, 31 December 2017, reported by Bloomberg[21].

2. Data sources

One of the selection criteria – only publically traded airlines, assures the availability of reliable data. Publically traded companies are required to publish their financial results and annual reports through several sources. This research uses data from the respective companies' investor relations section. Further, specific financial data is exported from Bloomberg. The table below illustrates the data sources of the selected performance indicators for the comparative analysis.

Airlines annual reports	Bloomberg	Calculated
☐ ASK	☐ Market share price	☐ BELF
☐ RPK	☐ Market capitalisation	☐ Operating profit
☐ LF	☐ Enterprise value	☐ RASK
☐ OTP	☐ EBITDA margin	☐ CASK
☐ Fleet size	☐ Net profit margin	☐ Yield
☐ Passenger traffic	☐ Operating margin	
☐ Operating reveue	☐ RoE	
☐ Operating costs	☐ RoA	
☐ Operating profit	☐ RoI	
☐ Profit after tax		

Table 4. Data sources

[20] Source: (Pegasus Airlines, 2017)

[21] Bloomberg reports market capitalization as the product of number of listed shares and share price of the day that is chosen as a value date. Then, enterprise value is a computation of the Market capitalization reduced by the cash and equivalents held by the company and increased by the preferred equity, minority interest and total debt (see page 22).

3. Scope of research

The first part defines partially the geographical scope of the research. In addition, the data is limited to only the period from 2014-2017 (incl.). There are several reasons for such time constraint:

- Avoid any post-effects of the economic crisis of 2008;
- From the set of airlines, WizzAir is the last airline to go public (2015); hence, publically accessible data is only available from 2015[22] onwards.

The collected data (see Appendix 3) is then split in two sets based on geographical level: 5 European low-cost airlines and 5 North-American low-cost airlines:

European low-cost airlines	North American low-cost airlines
Ryanair	**Southwest Airlines**
easyJet	**jetBlue**
Norwegian Air Shuttle ASA	**Spirit airlines**
Pegasus airlines	**Allegiant Air**
WizzAir	**WestJet**

Table 5 Split of selected set of LCC: Europe and North America

4. Two sample t-test

For the purposes of the research: determining is there a difference between the way the low-cost airlines business model is operationalized in Europe and North America, a two-sample t-test is fairly convenient statistical approach in finding out not only if there's difference between two sets of data but also determining if it is significant. The samples are organized in the following way:

1. Split of the data on geographic level – Europe and North America;
2. Every sample is using one performance indicator and consists of each of the 5 airlines' indicators for all years from 2014 to 2017 (incl.);

The two datasets are independent as one does not influence on the other.

After organizing the data sets in two samples per performance indicator (of 20 values per sample), multiple t-tests are performed in evaluating which set of airlines achieves better

[22] The annual report of 2015 contains data for 2014

performance indicators in the period 2014-2017. The analysis uses a significance level of $\alpha=0.05$.

There are several figures which are not used in the t-test analysis. These indicators are mainly absolute figures and as such, they would not be meaningful for such comparison:

- Market share price;
- Market capitalization;
- Operating revenue, operating cost, operating profit;
- Fleet size;
- Passenger traffic;
- Enterprise value;
- ASK and RPK.

The abovementioned would only be of interest if the purpose of this research was to rank airline based on specific criteria. For example, comparing size of fleet will not give us any information about the performance of the airlines in the selected set.

The next part will present the results of multiple t-tests which are performed via using the evaluated variables in Table 6.

Overall market performance indicators	Operational performance indicators	Airline profitability indicators
• EBITDA margin • Operating margin • Net profit margin • RoE • RoA • RoI	• LF • BELF • OTP	• CASK • RASK • Yield • Net profit

Table 6 Evaluated performance indicators

The main statistical questions for the t-tests what is the difference in mean between North American and European performance indicators and is this difference significant. The results of the performed analysis is discussed next.

5. Results

The results of all t-tests are presented in Appendix 4. Table 7 below summarizes the results of all t-tests. The first column indicates the performance indicator which is used for the t-test. Next, split on a geographical level into North America and Europe, it is indicated which sample of low-cost airlines indicates better values for the analyzed performance indicator. The following column shows the difference of the means for the analyzed performance indicator between the two compared samples of airlines. In the last column of Table 7, it is shown if the difference is statistically significant at 5% significance level.

Performance indicator	Region	Difference of means	Is it significant?
EBITDA margin	North America	7.80	**Yes**
Operating margin	North America	5.61	**Yes**
Net profit margin	North America	2.54	No
RoE	North America	8.52	No
RoA	North America	2.12	No
RoI	Europe	0.09	No
LF	Europe	3.20%	**Yes**
BELF	North America	4.12%	**Yes**
OTP	Europe	16.75%	**Yes**
CASK (€ cents)	North America	1.29	**Yes**
RASK (€ cents)	North America	1.96	**Yes**
Yield (€ cents)	North America	2.56	**Yes**
Net profit (€ mln)	North America	301.87	**Yes**

Table 7: Summary of performed t-tests

From the evaluated 13 indicators, the difference between North American and European airlines does not turn to be significant when comparing most of the overall market (non-airline-industry specific) indicators: Net profit margin, RoA, RoI and RoE. On the other hand, EBITDA and Operating margins in North America tend to be significantly higher than in Europe for the selected set of airlines. This results translates into North American low-cost airlines achieving higher cash flows and operational profitability.

The higher profitability levels of North American airlines is further underlined by the higher RASK and yield in comparison to the European low-cost carriers from the selected set. However, North American LCC score on average €1.29 cents more per ASK which means that although the generated revenue is higher, the related costs are also significantly higher. Nevertheless, North American LCC are significantly more profitable as a whole in comparison to the European LCC. This conclusion can be influenced by the level of BELF, which for the sample of North American airlines tends to be much lower; hence, they turn are quicker in terms of reaching to break-even.

Regardless of the profitability of the LCC in North America, the European LCC are indicating much more accurate values when it comes to estimation of supply and demand. This conclusion stems from the higher LF which European LCC achieve. Further, European LCC tend to be significantly more accurate, on average by 16.75%, in comparison to the North American LCC from the selected set. Therefore, European LCC show in general much better operational results in regards to operationalizing the essentials of the low-cost airlines business model.

6. Data analysis

As it is highly dependable on the way performance is defined, it is too ambiguous to declare if low-cost airlines operationalize the LCC business model better in North America or Europe. However, there is a somewhat significant difference in the performance indicators of the selected set of airlines. While the sample of European LCC show better results when it comes to airline specific KPI, North American LCC report higher figures in terms of profitability.

Before discussing profitability of the selected airlines, let's evaluate what are the revenue streams and cost structure of low-cost airlines composed of?

Revenue streams are not only a performance indicator, but also a measure for the company's ability to earn in excess to the operating expenses. Generated revenues are a measure of the company's success to create value for its customers. In the case of low-cost airlines, revenue is a composition of seat and non-seat, ancillary, revenues. The latter Ryanair defines as revenues from excess baggage charges, administration/credit card fees, sales of rail and bus tickets, priority boarding, reserved seating, accommodation, travel insurance and car rental, in-flight sales and commissions received from products sold on the company's website or linked websites (Ryanair, 2016). Figure 7 shows the split of revenue for 2017 of the selected set of airlines. This split yells ununiformed results in regard to identifying difference between North American and European LCC. For example, easyJet leads in rank of generating seat revenue versus ancillary revenue, however, all other European based LCC appear after Southwest Airlines, jetBlue and WestJet. Therefore, in regard to revenue streams, this split does not indicate clear differences in the way the low-cost airlines business model is operationalized on geographical level.

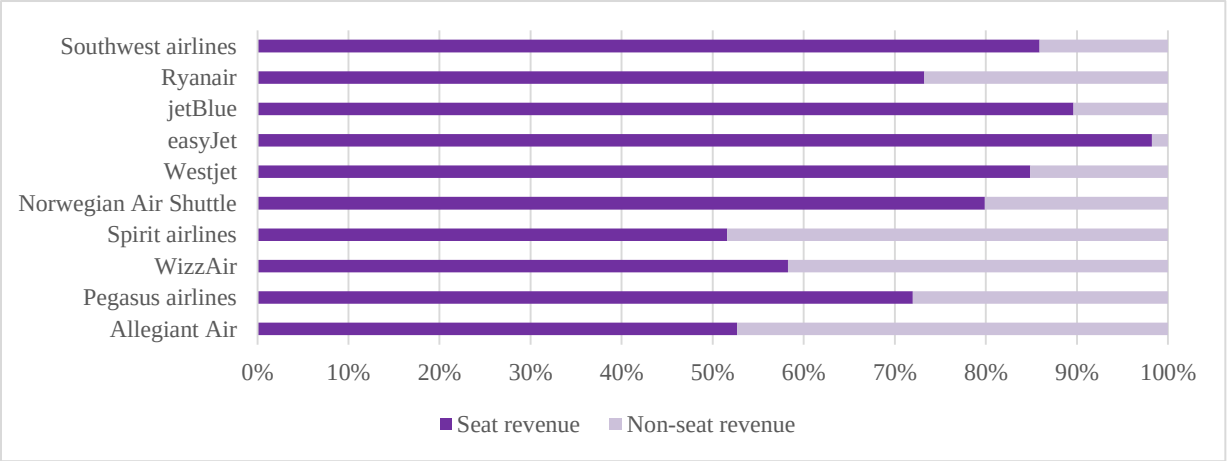

Figure 7 Split of revenue, 2017

In regard to operating costs, however, from the reported data it turns out that among the selected set of airlines, fuel expenses are sensible cost element in their operational activities. Figure 8 visualizes crew, fuel, airport and ground handling and maintenance expenses of the selected set of low-cost airlines for 2017. From Figure 8 it is clear that North American LCC spend more (or in the case of Spirit airlines, almost equally) for salaries of their staff in comparison to fuel. On the other hand, in Europe, crew expenses are lower (with the exception of Pegasus airlines) than both fuel costs and airport and ground handling fees. These operational expenses were already expected following the conclusion of part III.3.11 (p. 39), where the generic low-cost airlines business model canvas was drawn. As there are differences in the way low-cost airlines apply decisions related to connecting flights and airport utilization (using as hubs or bases bigger and busier airports in USA vs. local, regional and developing airports in Europe), it makes sense that there is a difference as well in the resulting cost structure and performance of low-cost airlines on geographical level.

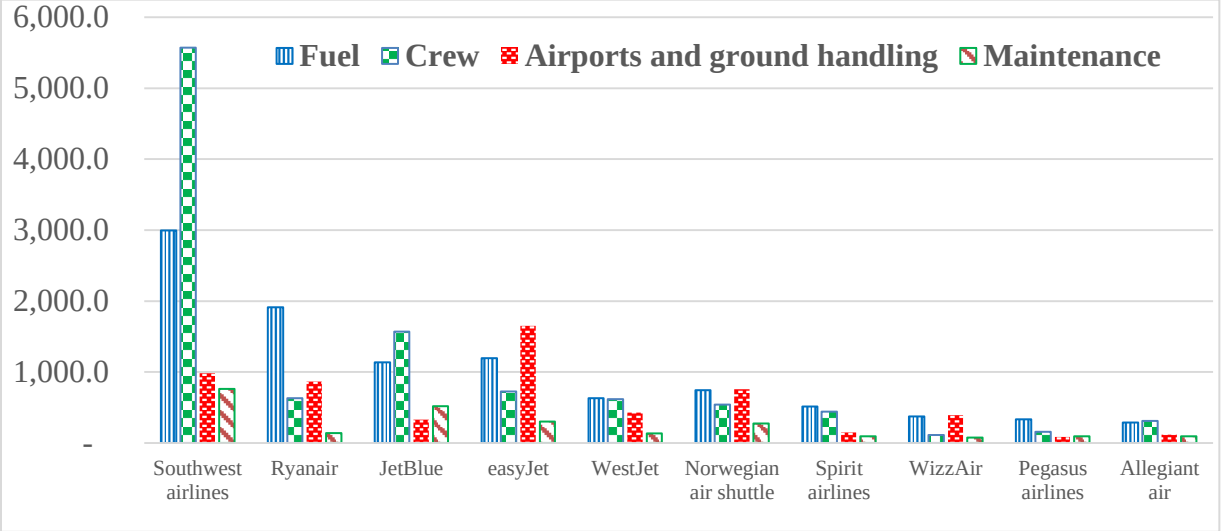

Figure 8 Split of operating costs (in mln EUR), 2017

From the performed t-tests of performance indicators and Table 8 below it can be concluded that the North American sample of LCC is much more consistent in regard to financial efficiency. In addition, the difference between the means of net profit of North American and European LCC is almost equal to the average net profit for only the European airlines in the compared datasets. However, net profit margin turned to be insignificantly different between the compared datasets. Instead, EBITDA and operating margins stand out as significantly different; both in favor of North American LCC. In addition, all CASK, RASK, yield and net profit are also significantly different and in favor of North American LCC. Reverting to Figure 6, these indicators were indicated as being closely related to cost structure and respective generated revenue streams. Such conditions outline the clear advantage of North American LCC in terms of market performance and profitability indicators.

Low-cost airline	**Region**	**2014**	**2015**	**2016**	**2017**
Ryanair	Europe	15%	23%	29%	30%
Southwest Airlines	North America	14%	26%	23%	20%
WizzAir	Europe	12%	16%	20%	19%
Allegiant Air	North America	43%	62%	39%	18%
jetBlue	North America	10%	23%	25%	17%
Spirit Airlines	North America	23%	31%	24%	17%
WestJet	North America	14%	16%	12%	11%
easyJet	Europe	15%	17%	12%	9%
Pegasus Airlines	Europe	9%	5%	-4%	8%
Norwegian Air Shuttle ASA	Europe	5%	17%	18%	5%

Table 8: Revenue in excess of costs (source: Respective airline's corporate website)

On the other hand, BELF was shown as significantly lower and in favor of North American LCC. This is in line with the conclusion in regard to profitability above. The lower the BELF is, the "quicker" will the airline turn profitable. As BELF is dependent on the ratio of costs to revenue, this would mean that Table 8 can be further translated to ability of North American LCC to earn in excess of their operating costs in comparison to European LCC. Going from the conceptualization of Figure 6, such conclusion further underlines the effectives of the operationalization of the low-cost airlines business model in North America.

However, BELF is also dependent on actual LF. In regard to LF, European LF tends to be significantly higher, on average 3.2%, than the LF of low-cost airlines with operations focus in North America. Such a condition leads to the idea that European low-cost carriers assess the market conditions much better and in a more precise manner. The closer the LF is to 100%, the better decisions has the airline made in regard to the execution of the core characteristics of the low-cost airlines business model.

In addition to LF, OTP is shown as significantly different and in favor of European LCC. The higher the OTP is, the less there are any associated delays, cost of delays, and even exceeding of block hours. Therefore, OTP has a positive influence on the cost structure of the European sample of airlines.

Overall, if Figure 6 is considered leading towards conclusion in determining if there is a difference between the way European and North American LCC operationalize the low-cost airlines business model, then the European sample has a distinctive advantage only when it comes to LF and OTP. However, both of these indicators are specific airlines KPI. On the other hand, North American LCC appear to achieve higher figures in terms of overall market presence and profitability. Therefore, it mostly depends on the way performance is determined, so to answer the question which of the two sets of LCC apply better the low-cost airlines business model. Nevertheless, there is difference in the reported performance indicators. In terms of what this difference is, it turns out that it is both strategical and operational as the same business concept leads to different results.

V. Performance in practice: low-cost airlines

1. Key findings

Business models are a way of mapping the integral business system of a company so to get a major comprehension of the characteristics of the business, its performance and the relationship between them. The existence of different business models is undoubted. The focus of this research is on finding out differences in the way the same business model, low-cost airlines business model, is operationalized in different geographic regions, North America and Europe, and how such differences influences firm performance.

In the sense of business models, the continuing re-validation of the company's ability to cope with market externalities re-shapes the company's business model and this may very well explain why one turns to be unique rather than identical to others. Therefore, it comes down not only to business model design, but also business model re-design. The business model canvas is presented as a useful tool which helps for better understanding the infrastructure of the firm. The conceptual core of the canvas – its nine interconnected blocks, are architecting the firm's path to realizing its company goals. The ability of companies to achieve competitive advantage in different ways theoretically proves the existence of different applications of the same business model within the same industry. If strategy is aligning internal resources with the external context as a step to achieving the company's goals, then business model design reveals how you do that efficiently. A successful implementation of such strategical development is linked to the performance level which the company achieves.

Performance is an outcome of the strategical considerations and decisions undertaken by the company's management. On the same note, performance is a complex measure which indicates the results of applying the selected business model. Although difficult to uniformly measure and compare performance between companies regardless of industry specifications, there are overall market indicators which allow to measure performance in general and among different business environments. If the business model canvas helps for better understanding of the complete orchestration of a company's strategical and operational direction, bridging such indicators with the nine blocks of the business model canvas is a way of better understanding how is performance achieved and what is its relationship with the selected business model. Nevertheless, performance can be evaluated more precisely by accenting on business fields where actors are fairly interchangeable and competitive levels are high. Such is the case of the commercial airline industry.

The airline industry is a dynamic and vast segment of the transportation world. It plays a key role for tourism and quick freight services. It stimulates economic development as it does not differentiate between poor, developing or developed regions, but rather links them in a wide web of connections, regardless of their geographic, political or economic situation.

The low-cost airlines segment is one of the cores of the airline industry. The emergence and rapid growth of low-cost airlines significantly increases the competition within the airline industry. The importance of the low-cost airlines business model is related to the simplicity of the offered product. Most notably in Europe and North America, low-cost airlines tend to meet a rising share of the air travel demand. Review of the characteristics of the low-cost airlines concept shows that there are different ways of operationalizing the LCC business model on geographical level. Further, the differences are somewhat obvious on the left side of the LCC business model canvas: LCC in North America sometimes offer connecting flights, establish partnerships with larger international airports, and thus, establish a "rolling hub" network in contrast to LCC in Europe, where LCC do not offer connecting flights, use primarily smaller and regional airports and utilize a point-to-point flights network. Moreover, European LCC establish partnerships and alliances with other airlines as a way of both expanding and improving their network. However, such implications suggest different results in regard to performance. Then, in addition to evaluating performance in general, airline industry-specific indicators assist in determining the differences in the way LCC in North America and Europe operationalize the low-cost airlines business model. Similarly to bridging overall market performance indicators to the business model canvas, commercial aviation KPIs are allocated to the generic low-cost airlines business model so to reveal relationship between firm performance and business model characteristics through the lenses of low-cost airlines.

10 low-cost airlines are selected for quantifying the difference in the way the LCC business model is operationalized. By performing multiple two sample t-tests on both overall and aviation performance indicators, it is concluded that there are significant differences in the achieved results by low-cost airlines in North America and Europe although both sets of low-cost airlines apply essentially the same business model. European low-cost airlines from the selected for this research set are associated with better airline industry-specific KPIs, namely load factors and on-time performance. Load factors are a ratio of the demand to the produced capacity and is the clearest indicator in terms of showing if the airline's product is met by the desired demand. On the other hand, OTP reflects the operational superiority of European LCC as they tend to delay much less frequent their flights. At the same time, however, LCC in North America are reporting much higher figures in terms of both profitability and overall market performance. Further

differences are notable in the composition of operating expense: crew expenses of LCC in North America tend to be the highest among operating costs, while in Europe, low-cost carriers spend much more on fuel and airport fees than for flight crew.

Conclusively, while generally identical, the low-cost airlines business model appears to be achieving different results in Europe and North America. As performance can be defined by applying certain criteria, it can be both concluded that European LCC perform better as they achieve higher airlines-specific KPI or that North American LCC perform better as they achieve higher overall market indicators and are more profitable. Performance is key in this research. It provides insight of how well the selected set of airlines execute the low-cost airlines business concept. Performance in the airline industry is generally the assessment of operational measures such as load factors, break-even load factors, on-time performance, and financial measures such as operating margins, revenue and cost per produced capacity and net profit. As all of these indicators represent the results of operationalizing the low-cost airlines business model, it is concluded that the difference between European and North American LCC emerges on both operational and financial level, with focus on the operational (left) side of the low-cost airlines business model canvas.

2. Possible limitations and criticism

This research evaluates differences in executing the same business model by focusing on the low-cost airlines business model and the way it is operationalized in Europe and North America. The analysis is performed by focusing only on the smaller one of the two main business models in the airline industry – low-cost airlines.

The data used for the analysis is constrained only to the period of 2014-2017. Such a time constraints may have influence on the datasets and result in improperly allocated values for entirety of either Europe or North America. Furthermore, the research takes into consideration 10 publically traded low-cost carriers. However, there are other low-cost airlines in both Europe and North America, such as respectively Thomas Cook and Frontier, which may be more suitable for defying the low-cost airlines for either of the considered regions.

In addition, it can be assumed that some of the airlines in the selected set do not represent completely the low-cost carrier profile anymore. For example Norwegian offers intercontinental flight services, which is not something in common for LCCs; nevertheless, they are still considered low-cost airlines. Therefore, the current activities by the airlines in the examined set can be derailing from the known characteristics of the low-cost airlines business model.

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Appendix

Appendix 1: Aircraft orders

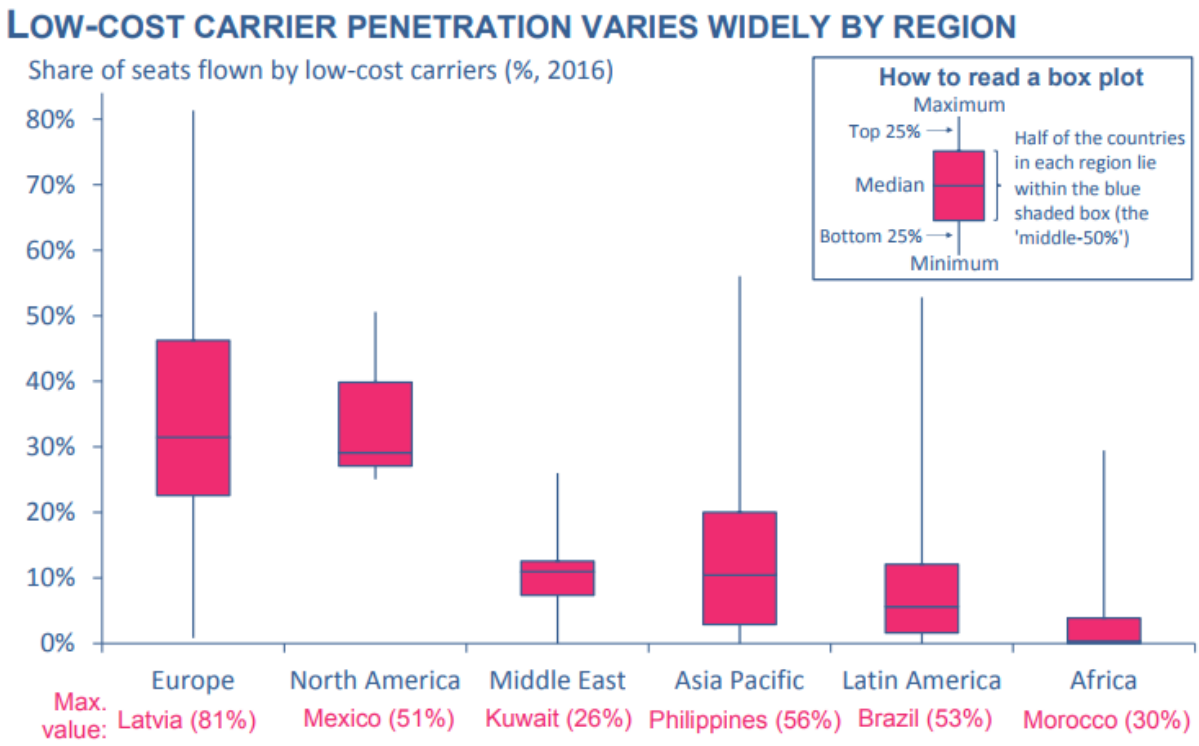
Customer Summary Through June 2017

Ryanair (Ireland)

Model Series	Eng	First Order	Orders	Deliveries	Unfilled	First Delivery
737 MAX	CF	28-Nov-2014	110	-	110	
737-800	CF	09-Mar-1998	531	466	65	19-Mar-1999
737 Total			**641**	**466**	**175**	
Customer Total			641	466	175	

Source: *(Boeing, 2017)*

Appendix 2: Share of seats flown by low-cost carriers



Sources: IATA, 2017; SRS Analyzer, 2017

Appendix 3: Collected data

		Ryanair			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	10.06	15.01	14.51	15.05
Market Cap (31-Dec-YYYY)	€	10,524	15,330	18,276	17,690
Enterprise value (31-Dec-YYYY)	€	10,379	14,972	17,978	17,946
EBITDA margin		25.1	28.9	30.6	31.2
Operating margin		18.4	22.3	23.1	23.3
Net income margin		15.3	23.9	19.8	20.3
RoE		23.7	40.9	32.8	32.6
RoA		8.3	13.3	11.3	11.9
RoI		11.8	15.7	15.9	16.6
Available seat kilometers	mln	125,394.5	128,248.6	140,738.7	157,569.3
Revenue passenger kilometers	mln	103,755.1	113,186.8	130,591.8	148,676.0
Load factor	%	83.0%	88.0%	93.0%	94.0%
Break-even load factor	*%*	*72.1%*	*71.8%*	*72.2%*	*72.3%*
On-time performance	%	92.0%	90.0%	90.0%	88.0%
Fleet size	#	297	308	341	350
Passenger traffic	mln	81.7	90.6	106.4	120.0
Seat revenue	mln €	3,789.5	4,260.3	4,967.2	4,868.2
Non-seat revenue	mln €	1,247.2	1,393.7	1,568.6	1,779.6
Operating revenue	mln €	5,036.7	5,654.0	6,535.8	6,647.8
Fuel	mln €	(2,013.1)	(1,992.1)	(2,071.4)	(1,913.4)
Staff	mln €	(463.6)	(502.9)	(585.4)	(633.0)
Airport and ground handling	mln €	(617.2)	(712.8)	(830.6)	(864.8)
Maintenance	mln €	(116.1)	(134.9)	(130.3)	(141.0)
Other operating costs	mln €	(1,168.1)	(1,268.4)	(1,458.0)	(1,561.6)
Operating costs	mln €	(4,378.1)	(4,611.1)	(5,075.7)	(5,113.8)
Operating profit	mln €	658.6	1,042.9	1,460.1	1,534.0
Operating profit (Airlines KPI)	*mln €*	*643.0*	*1,059.3*	*1,445.4*	*1,559.2*
Profit after tax	mln €	522.8	866.7	1,559.1	1,315.9
RASK	*€ cents*	*4.02*	*4.41*	*4.64*	*4.22*
CASK	*€ cents*	*3.49*	*3.60*	*3.61*	*3.25*
Yield	*€ cents*	*4.84*	*5.01*	*4.99*	*4.49*

Ryanair: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Easyjet			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	21.52	23.59	11.76	16.47
Market Cap (31-Dec-YYYY)	€	7,255	9,547	4,618	5,483
Enterprise value (31-Dec-YYYY)	€	6,713	8,958	4,372	5,078
EBITDA margin		15.4	17.6	14.3	11.9
Operating margin		12.8	14.7	10.7	8.0
Net income margin		9.9	11.7	9.1	6.0
RoE		21.5	24.8	17.2	11.1
RoA		10.1	11.8	8.3	5.3
RoI		17.0	20.3	14.4	9.9
Available seat kilometers	mln	79,525.0	83,846.0	87,724.0	95,792.0
Revenue passenger kilometers	mln	72,933.0	77,619.0	81,496.0	89,685.0
Load factor	%	90.6%	91.5%	91.6%	92.6%
Break-even load factor	%	74.1%	73.1%	76.5%	85.1%
On-time performance	%	85.0%	80.0%	77.0%	76.0%
Fleet size	#	226	241	257	279
Passenger traffic	mln	64.8	68.6	73.1	80.2
Seat revenue	mln €	5,745.3	6,264.4	5,381.0	5,582.71
Non-seat revenue	mln €	83.7	95.0	96.2	100.21
Operating revenue	mln €	5,829.0	6,359.4	5,477.2	5,682.92
Fuel	mln €	(1,610.8)	(1,627.2)	(1,306.8)	(1,195.81)
Staff	mln €	(616.8)	(685.3)	(635.8)	(726.27)
Airport and ground handling	mln €	(1,425.4)	(1,522.7)	(1,486.3)	(1,649.59)
Maintenance	mln €	(273.0)	(310.8)	(278.0)	(301.77)
Other operating costs	mln €	(1,155.0)	(1,279.7)	(1,186.0)	(1,350.07)
Operating costs	mln €	(5,080.9)	(5,425.7)	(4,893.0)	(5,223.51)
Operating profit	mln €	748.1	933.7	584.2	459.41
Profit after tax	mln €	579.4	743.7	500.9	343.43
RASK	€ cents	7.33	7.58	6.24	5.93
CASK	€ cents	6.39	6.47	5.58	5.45
Yield	€ cents	8.09	8.29	6.82	6.41

easyJet: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Norwegian Air Shuttle			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	30.44	33.55	31.45	17.82
Market Cap (31-Dec-YYYY)	€	1,072	1,203	1,128	639
Enterprise value (31-Dec-YYYY)	€	2,359	3,029	3,504	2,953
EBITDA margin		(3.4)	6.6	12.0	(1.9)
Operating margin		(7.2)	1.5	7.0	(6.5)
Net income margin		(5.5)	1.1	4.4	(5.8)
RoE		(44.0)	9.7	32.4	(58.6)
RoA		(5.7)	0.9	3.3	(4.4)
RoI		(6.0)	3.7	6.4	(5.0)
Available seat kilometers	mln	46,479.0	49,028.0	57,910.0	72,341.0
Revenue passenger kilometers	mln	37,615.0	42,284.0	50,798.0	63,320.0
Load factor	%	80.9%	86.2%	87.7%	87.5%
Break-even load factor	%	63.6%	60.7%	60.7%	82.9%
On-time performance	%	84.7%	81.5%	75.6%	75.8%
Fleet size	#	95	99	118	144
Passenger traffic	mln	24.0	25.8	29.3	33.1
Seat revenue	mln €	1,802.6	1,926.4	2,320.5	2,508.99
Non-seat revenue	mln €	364.4	414.9	545.5	632.26
Operating revenue	mln €	2,167.0	2,341.3	2,866.0	3,141.25
Fuel	mln €	(701.0)	(539.7)	(555.8)	(744.93)
Staff	mln €	(355.9)	(357.4)	(436.9)	(539.60)
Airport and ground handling	mln €	(507.8)	(550.3)	(692.9)	(755.70)
Maintenance	mln €	(143.1)	(178.7)	(205.1)	(274.71)
Other operating costs	mln €	(351.6)	(380.2)	(528.8)	(662.85)
Operating costs	mln €	(2,059.3)	(2,006.3)	(2,419.5)	(2,977.79)
Operating profit	mln €	107.7	335.0	446.5	(203.21)
Profit after tax	mln €	(118.6)	25.6	124.8	(182.06)
RASK	€ cents	4.66	4.78	4.95	4.34
CASK	€ cents	4.43	4.09	4.18	4.12
Yield	€ cents	5.76	5.54	5.64	4.96

Norwegian Air Shuttle: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Pegasus airlines			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	11.72	5.54	3.81	7.42
Market Cap (31-Dec-YYYY)	€	567	389	759	472
Enterprise value (31-Dec-YYYY)	€	711	921	1,110	909
EBITDA margin		15.0	12.4	5.3	14.5
Operating margin		13.4	10.1	3.3	13.8
Net income margin		4.7	3.2	(3.6)	9.4
RoE		12.4	8.6	(8.8)	24.6
RoA		4.1	3.0	(2.8)	7.3
RoI		8.4	3.8	(2.9)	6.2
Available seat kilometers	mln	24,378.0	27,969.0	30,510.0	32,718.0
Revenue passenger kilometers	mln	19,478.0	22,095.5	23,980.9	27,679.4
Load factor	%	79.9%	79.0%	78.6%	84.6%
Break-even load factor	*%*	*73.5%*	*75.0%*	*81.5%*	*78.2%*
On-time performance	%	84.8%	79.7%	79.1%	84.1%
Fleet size	#	55	67	82	76
Passenger traffic	mln	19.7	22.3	24.1	27.8
Seat revenue	mln €	826.8	841.6	729.5	844.46
Non-seat revenue	mln €	263.4	258.8	270.4	329.07
Operating revenue	mln €	1,090.1	1,100.5	999.9	1,173.53
Fuel	mln €	(414.4)	(352.9)	(265.9)	(332.65)
Staff	mln €	(123.1)	(139.6)	(174.0)	(156.36)
Airport and ground handling	mln €	(103.6)	(117.5)	(117.0)	(84.89)
Maintenance	mln €	(56.2)	(85.4)	(97.2)	(91.98)
Other operating costs	mln €	(305.3)	(349.3)	(382.7)	(418.74)
Operating costs	mln €	(1,002.6)	(1,044.6)	(1,036.9)	(1,084.63)
Operating profit	mln €	87.5	55.8	(37.0)	139.07
Operating profit (Airlines KPI)	*mln €*	*87.5*	*55.8*	*(37.0)*	*88.90*
Profit after tax	mln €	50.7	35.3	(36.7)	109.94
RASK	*€ cents*	*4.47*	*3.93*	*3.28*	*3.59*
CASK	*€ cents*	*4.11*	*3.74*	*3.40*	*3.32*
Yield	*€ cents*	*5.60*	*4.98*	*4.17*	*4.24*

Pegasus airlines: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		WizzAir			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	-	24.64	20.96	41.40
Market Cap (31-Dec-YYYY)	€	1,943	2,369	1,967	3,807
Enterprise value (31-Dec-YYYY)	€	1,525	1,756	1,225	2,859
EBITDA margin		13.4	16.4	18.5	19.4
Operating margin		10.9	13.6	16.5	15.7
Net income margin		8.7	14.9	13.5	15.7
RoE		75.9	59.1	33.6	30.0
RoA		16.8	22.8	16.4	16.2
RoI		57.0	45.8	37.6	28.1
Available seat kilometers	mln	24,385.0	29,266.5	34,844.0	41,691.0
Revenue passenger kilometers	mln	20,867.0	25,350.8	30,786.1	37,627.8
Load factor	%	85.7%	86.7%	88.2%	90.1%
Break-even load factor	*%*	*76.4%*	*74.9%*	*73.7%*	*76.0%*
On-time performance	%	73.2%	82.6%	82.3%	78.2%
Fleet size	#	46	55	67	79
Passenger traffic	mln	13.9	16.5	20.0	23.8
Seat revenue	mln €	658.7	793.8	894.9	915.5
Non-seat revenue	mln €	353.1	433.5	534.2	655.7
Operating revenue	mln €	1,011.8	1,227.3	1,429.1	1,571.2
Fuel	mln €	(360.6)	(396.6)	(401.5)	(375.5)
Staff	mln €	(68.3)	(83.4)	(101.4)	(112.9)
Airport and ground handling	mln €	(250.4)	(297.7)	(343.1)	(390.0)
Maintenance	mln €	(48.4)	(62.0)	(77.5)	(74.7)
Other operating costs	mln €	(174.3)	(220.3)	(270.1)	(371.4)
Operating costs	mln €	(902.0)	(1,060.0)	(1,193.6)	(1,324.5)
Operating profit	mln €	109.8	167.3	235.5	246.7
Operating profit (Airlines KPI)	*mln €*	*108.4*	*166.2*	*238.0*	*249.4*
Profit after tax	mln €	87.7	183.2	192.9	246.0
RASK	*€ cents*	*4.15*	*4.19*	*4.10*	*3.77*
CASK	*€ cents*	*3.70*	*3.62*	*3.43*	*3.18*
Yield	*€ cents*	*4.84*	*4.84*	*4.65*	*4.18*

WizzAir: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Southwest Airlines			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	34.98	39.63	47.26	54.44
Market Cap (31-Dec-YYYY)	€	25,663	29,070	32,042	24,861
Enterprise value (31-Dec-YYYY)	€	26,108	29,730	33,019	25,213
EBITDA margin		17.0	25.9	24.4	22.4
Operating margin		12.0	20.8	18.4	16.6
Net income margin		6.1	11.0	11.0	16.5
RoE		16.1	30.9	28.4	37.0
RoA		5.8	10.6	10.1	14.4
RoI		11.5	19.9	16.0	21.8
Available seat kilometers	mln	210,830.4	226,115.1	239,023.1	247,534.9
Revenue passenger kilometers	mln	173,865.7	189,097.7	200,842.9	207,672.0
Load factor	%	82.5%	83.6%	84.0%	83.9%
Break-even load factor	*%*	*72.6%*	*66.3%*	*68.5%*	*70.0%*
On-time performance	%	73.6%	79.8%	81.0%	80.2%
Fleet size	#	665	704	723	706
Passenger traffic	mln	135.8	144.6	151.7	157.7
Seat revenue	mln €	14,596.1	16,853.4	17,675.5	15,150.64
Non-seat revenue	mln €	782.8	1,400.8	1,740.5	2,484.80
Operating revenue	mln €	15,378.9	18,254.2	19,416.0	17,635.44
Fuel	mln €	(4,374.8)	(3,338.6)	(3,473.2)	(2,996.16)
Staff	mln €	(4,483.1)	(5,874.8)	(6,452.2)	(5,570.99)
Airport and ground handling	mln €	(920.4)	(1,074.0)	(1,157.7)	(983.12)
Maintenance	mln €	(812.2)	(931.7)	(988.3)	(760.74)
Other operating costs	mln €	(2,945.4)	(3,248.0)	(3,769.6)	(4,396.43)
Operating costs	mln €	(13,536.0)	(14,467.1)	(15,841.0)	(14,707.45)
Operating profit	mln €	1,842.9	3,787.1	3,575.0	2,928.00
Operating profit (Airlines KPI)	*mln €*	*1,836.8*	*3,793.4*	*3,581.2*	*2,927.17*
Profit after tax	mln €	939.0	2,008.7	2,133.1	2,905.50
RASK	*€ cents*	*7.29*	*8.07*	*8.12*	*7.12*
CASK	*€ cents*	*6.42*	*6.40*	*6.63*	*5.94*
Yield	*€ cents*	*8.84*	*9.66*	*9.67*	*8.49*

Southwest Airlines: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		JetBlue			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	13.11	20.84	21.26	18.58
Market Cap (31-Dec-YYYY)	€	4,062	6,712	7,164	5,965
Enterprise value (31-Dec-YYYY)	€	5,322	7,587	7,555	6,386
EBITDA margin		14.4	24.3	25.7	20.6
Operating margin		8.9	19.0	19.8	14.3
Net income margin		6.9	10.6	11.4	16.4
RoE		17.2	23.6	21.0	25.9
RoA		5.3	8.2	8.4	12.0
RoI		6.4	13.1	12.8	18.9
Available seat kilometers	mln	72,410.8	79,273.1	86,293.0	90,134.5
Revenue passenger kilometers	mln	60,854.1	67,127.3	73,416.7	76,025.4
Load factor	%	84.0%	84.7%	85.1%	84.3%
Break-even load factor	*%*	*76.6%*	*68.6%*	*68.3%*	*72.3%*
On-time performance	%	75.4%	75.9%	75.0%	74.3%
Fleet size	#	203	215	227	243
Passenger traffic	mln	32.1	35.1	38.3	40.0
Seat revenue	mln €	4,416.5	5,427.5	5,716.0	5,237.90
Non-seat revenue	mln €	391.8	481.7	588.4	605.59
Operating revenue	mln €	4,808.3	5,909.1	6,304.4	5,843.50
Fuel	mln €	(1,580.5)	(1,241.5)	(1,020.9)	(1,135.38)
Staff	mln €	(1,069.6)	(1,418.3)	(1,614.1)	(1,571.87)
Airport and ground handling	mln €	(265.3)	(315.0)	(339.4)	(330.70)
Maintenance	mln €	(345.5)	(451.3)	(535.2)	(518.13)
Other operating costs	mln €	(1,121.7)	(1,363.1)	(1,547.6)	(1,454.42)
Operating costs	mln €	(4,382.6)	(4,789.2)	(5,057.2)	(5,010.50)
Operating profit	mln €	425.7	1,119.9	1,247.2	833.00
Operating profit (Airlines KPI)	*mln €*	*428.0*	*1,118.4*	*1,245.6*	*836.23*
Profit after tax	mln €	331.5	623.5	721.5	955.45
RASK	*€ cents*	*6.64*	*7.45*	*7.31*	*6.48*
CASK	*€ cents*	*6.05*	*6.04*	*5.86*	*5.56*
Yield	*€ cents*	*7.91*	*8.80*	*8.58*	*7.69*

jetBlue: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		WestJet			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	23.74	13.55	16.24	17.50
Market Cap (31-Dec-YYYY)	€	3,031	1,668	1,904	1,996
Enterprise value (31-Dec-YYYY)	€	2,910	1,662	2,274	2,445
EBITDA margin		17.7	20.7	19.2	18.7
Operating margin		12.0	14.1	10.7	9.8
Net income margin		7.1	9.1	7.2	6.3
RoE		16.9	19.7	14.7	13.3
RoA		6.5	7.5	5.2	4.5
RoI		11.5	12.0	7.9	6.8
Available seat kilometers	mln	41,173.5	43,294.9	47,151.1	49,886.9
Revenue passenger kilometers	mln	33,521.0	34,642.7	38,572.1	41,688.4
Load factor	%	81.4%	80.0%	81.8%	83.6%
Break-even load factor	*%*	*71.7%*	*68.7%*	*73.1%*	*75.4%*
On-time performance	%	78.9%	85.3%	82.7%	77.6%
Fleet size	#	122	140	153	168
Passenger traffic	mln	19.7	20.3	22.0	24.1
Seat revenue	mln €	2,694.7	2,663.3	2,663.1	2,532.87
Non-seat revenue	mln €	133.4	18.2	252.2	450.82
Operating revenue	mln €	2,828.1	2,681.5	2,915.3	2,983.69
Fuel	mln €	(775.4)	(542.0)	(541.5)	(629.59)
Staff	mln €	(515.6)	(533.5)	(603.9)	(619.72)
Airport and ground handling	mln €	(370.1)	(374.5)	(436.7)	(427.28)
Maintenance	mln €	(90.2)	(109.3)	(147.9)	(134.68)
Other operating costs	mln €	(738.7)	(742.9)	(874.0)	(881.51)
Operating costs	mln €	(2,490.0)	(2,302.3)	(2,604.1)	(2,692.79)
Operating profit	mln €	338.2	379.2	311.2	267.82
Operating profit (Airlines KPI)	*mln €*	*338.6*	*379.7*	*311.4*	*289.67*
Profit after tax	mln €	202.0	244.6	208.9	187.93
RASK	*€ cents*	*6.87*	*6.19*	*6.18*	*5.98*
CASK	*€ cents*	*6.05*	*5.32*	*5.52*	*5.40*
Yield	*€ cents*	*8.44*	*7.74*	*7.56*	*7.15*

WestJet: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Allegiant Air			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	124.24	154.45	157.77	128.72
Market Cap (31-Dec-YYYY)	€	2,163	2,595	2,624	2,068
Enterprise value (31-Dec-YYYY)	€	2,354	2,880	3,074	2,694
EBITDA margin		21.2	37.2	34.9	23.2
Operating margin		13.8	29.4	27.2	15.1
Net income margin		7.6	17.5	16.1	13.0
RoE		25.8	68.3	52.9	37.6
RoA		8.0	17.0	14.5	10.1
RoI		12.6	24.2	19.6	14.2
Available seat kilometers	mln	14,396.6	16,940.9	19,916.4	21,906.4
Revenue passenger kilometers	mln	12,594.7	14,395.5	16,548.6	17,874.6
Load factor	%	87.5%	85.0%	83.1%	81.6%
Break-even load factor	*%*	*75.4%*	*60.0%*	*60.5%*	*69.3%*
On-time performance	%				65.4%
Fleet size	#	72	82	84	89
Passenger traffic	mln	8.2	9.5	11.1	12.3
Seat revenue	mln €	826.8	841.6	729.5	659.93
Non-seat revenue	mln €	334.8	485.0	578.7	592.72
Operating revenue	mln €	1,161.6	1,326.7	1,308.2	1,252.65
Fuel	mln €	(320.9)	(256.4)	(244.6)	(286.09)
Staff	mln €	(159.8)	(211.6)	(277.6)	(309.58)
Airport and ground handling	mln €	(70.0)	(94.2)	(117.9)	(118.74)
Maintenance	mln €	(71.7)	(85.3)	(105.6)	(94.55)
Other operating costs	mln €	(187.4)	(172.6)	(197.6)	(254.46)
Operating costs	mln €	(809.8)	(820.1)	(943.3)	(1,063.42)
Operating profit	mln €	351.7	506.5	364.9	189.23
Operating profit (Airlines KPI)	*mln €*	*351.5*	*506.1*	*364.8*	*189.16*
Profit after tax	mln €	71.7	203.0	208.7	162.35
RASK	*€ cents*	*8.07*	*7.83*	*6.57*	*5.72*
CASK	*€ cents*	*5.63*	*4.84*	*4.74*	*4.85*
Yield	*€ cents*	*9.22*	*9.21*	*7.90*	*7.01*

Allegiant Air: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

		Spirit Airlines			
		2014	2015	2016	2017
Price per share (31-Dec-YYYY)	€	62.46	36.67	54.86	37.31
Market Cap (31-Dec-YYYY)	€	4,546	2,624	3,803	2,544
Enterprise value (31-Dec-YYYY)	€	4,143	2,479	3,974	3,045
EBITDA margin		20.8	27.2	23.5	20.0
Operating margin		18.4	23.8	19.1	14.7
Net income margin		11.7	14.8	11.4	15.9
RoE		25.4	28.5	20.2	26.5
RoA		16.3	15.4	9.3	11.5
RoI		23.1	21.3	13.3	15.8
Available seat kilometers	mln	26,296.9	34,192.4	41,029.7	47,625.0
Revenue passenger kilometers	mln	22,788.1	28,960.6	34,732.2	39,598.7
Load factor	%	86.7%	84.7%	84.7%	83.1%
Break-even load factor	*%*	*70.8%*	*64.6%*	*68.5%*	*70.9%*
On-time performance	%	75.9%	69.0%	74.2%	80.5%
Fleet size	#	65	79	95	112
Passenger traffic	mln	14.3	17.9	21.6	24.2
Seat revenue	mln €	946.4	1,077.0	1,141.3	1,137.9
Non-seat revenue	mln €	650.2	895.3	1,065.9	1,067.6
Operating revenue	mln €	1,596.6	1,972.3	2,207.3	2,205.5
Fuel	mln €	(506.6)	(425.0)	(425.4)	(512.8)
Staff	mln €	(259.1)	(347.7)	(449.1)	(439.8)
Airport and ground handling	mln €	(86.9)	(120.7)	(144.2)	(150.5)
Maintenance	mln €	(61.1)	(74.1)	(93.7)	(92.0)
Other operating costs	mln €	(389.3)	(535.9)	(673.0)	(686.6)
Operating costs	mln €	(1,303.0)	(1,503.4)	(1,785.5)	(1,881.6)
Operating profit	mln €	293.7	468.9	421.7	323.9
Operating profit (Airlines KPI)	*mln €*	*292.9*	*468.9*	*420.5*	*325.1*
Profit after tax	mln €	186.4	292.2	251.8	350.4
RASK	*€ cents*	*6.07*	*5.77*	*5.38*	*4.63*
CASK	*€ cents*	*4.95*	*4.40*	*4.35*	*3.95*
Yield	*€ cents*	*7.00*	*6.81*	*6.35*	*5.57*

Spirit airlines: financial and operational performance indicators (sources: company's investor relations website, Bloomberg)

Appendix 4: T-test analysis

	EBITDA margin North America	*EBITDA margin Europe*
Mean	22.95	15.15
Variance	30.58	87.22
Observations	20	20
t Stat	3.275385225	
P(T<=t) two-tail	0.003979911	
t Critical two-tail	2.093024054	

Results of t-test analysis for EBITDA margin between LCC in Europe and North America (2014-2017)

	Operating margin North America	*Operating margin Europe*
Mean	16.88	11.27
Variance	30.69	72.72
Observations	20	20
t Stat	2.771323862	
P(T<=t) two-tail	0.012159025	
t Critical two-tail	2.093024054	

Results of t-test analysis for Operating margin between LCC in Europe and North America (2014-2017)

	Net income margin North America	*Net income margin Europe*
Mean	11.37	8.84
Variance	14.44	70.75
Observations	20	20
t Stat	1.352313351	
P(T<=t) two-tail	0.192152699	
t Critical two-tail	2.093024054	

Results of t-test analysis for Net income margin between LCC in Europe and North America (2014-2017)

	RoE North America	*RoE Europe*
Mean	27.49	18.97
Variance	179.39	914.71
Observations	20	20
t Stat	1.184063984	
P(T<=t) two-tail	0.250989758	
t Critical two-tail	2.093024054	

Results of t-test analysis for return on equity between LCC in Europe and North America (2014-2017)

	RoA North America	*RoA Europe*
Mean	10.03	7.91
Variance	15.01	57.29
Observations	20	20
t Stat	1.353929931	
P(T<=t) two-tail	0.191645389	
t Critical two-tail	2.093024054	

Results of t-test analysis for return on assets between LCC in Europe and North America (2014-2017)

	RoI North America	*RoI Europe*
Mean	15.13	15.22
Variance	28.47	267.43
Observations	20	20
t Stat	-0.026927673	
P(T<=t) two-tail	0.978798242	
t Critical two-tail	2.093024054	

Results of t-test analysis for return on investments between LCC in Europe and North America (2014-2017)

	Load factor North America	*Load factor Europe*
Mean	83.77%	86.97%
Variance	0.0003	0.0023
Observations	20	20
t Stat	-2.862657393	
P(T<=t) two-tail	0.009962336	
t Critical two-tail	2.093024054	

Results of t-test analysis for load factors between LCC in Europe and North America (2014-2017)

	Break-even load factor North America	*Break-even load factor Europe*
Mean	69.60%	73.72%
Variance	0.0019	0.0041
Observations	20	20
t Stat	-2.275136067	
P(T<=t) two-tail	0.034671689	
t Critical two-tail	2.093024054	

Results of t-test analysis for break-even load factors between LCC in Europe and North America (2014-2017)

	On-time performance North America	*On-time performance Europe*
Mean	65.23%	81.97%
Variance	0.0811	0.0029
Observations	20	20
t Stat	-2.614180726	
P(T<=t) two-tail	0.017060662	
t Critical two-tail	2.093024054	

Results of t-test analysis for on-time performance between LCC in Europe and North America (2014-2017)

	CASK North America	*CASK Europe*
Mean	5.44	4.16
Variance	0.57	1.02
Observations	20	20
t Stat	5.777735595	
P(T<=t) two-tail	0.00001444	
t Critical two-tail	2.093024054	

Results of t-test analysis for cost per available seat kilometer between LCC in Europe and North America (2014-2017)

	RASK North America	*RASK Europe*
Mean	6.69	4.73
Variance	0.94	1.36
Observations	20	20
t Stat	6.639919115	
P(T<=t) two-tail	0.00000237	
t Critical two-tail	2.093024054	

Results of t-test analysis for revenue per available seat kilometer between LCC in Europe and North America (2014-2017)

	Yield North America	*Yield Europe*
Mean	7.98	5.42
Variance	1.25	1.38
Observations	20	20
t Stat	8.371593685	
P(T<=t) two-tail	0.00000008	
t Critical two-tail	2.093024054	

Results of t-test analysis for yield between LCC in Europe and North America (2014-2017)

	Net profit North America	*Net profit tax Europe*
Mean (in mln)	€ 659.41	€ 357.54
Variance	618,251.66	216,188.94
Observations	20	20
t Stat	3.176114553	
P(T<=t)	0.004973319	
t Critical	2.093024054	

Results of t-test analysis for net profits between LCC in Europe and North America (2014-2017)